Appendix 4.12-1 Traffic Impact Assessment Report (TIAR)

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River Crossing Marketplace

Specific Plan

UPDATED Traffic Impact Analysis Report

Prepared for:

City of Redding

Prepared by:

Formerly Omni-Means, Ltd.

River Crossing Marketplace Specific Plan

UPDATED Traffic Impact Analysis Report

Prepared for:

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Appendix A: Intersection Turning Movement Counts & Project Only Traffic Figures

Appendix B: Synchro Outputs

Appendix C: HCS Outputs

Appendix D: Signal Warrant Analysis Worksheets

Appendix E: Memorandum by Kittelson & Associates on Redding Costco/Trip Information (September 13, 2016)

Appendix F: Traffic Operations and Forecasts for the Bonnyview Interchange PSR ~~(TRB)~~ (May 2017)

Appendix G: Conceptual Designs of Proposed Improvements

Appendix H: Loma Vista Cut-Through Memorandum

Appendix I: Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum
Appendix J: Proposed Project and “Plus Rancheria” Impacts Comparison Memorandum

The Reason for this UPDATE

The Traffic Impact Analysis Report (TIAR) was prepared in November 2017, by Omni-Means (A GHD Company), and subsequently incorporated into the Environmental Impact Report (EIR) for the proposed River Crossing Marketplace Specific Plan.

On April 4, 2018 Omni-Means (A GHD Company) prepared an errata to the TIAR. The errata document was prepared to address minor revisions and modifications that resulted from the peer review performed by the City of Redding. The errata was incorporated into the EIR.

To make it easier to review the TIAR, this UPDATE has been prepared to incorporate the errata into the TIAR. No other updates were made to the TIAR.

Text that has been deleted is indicated with strike-thru text. Text that has been added is underlined.

Additionally, non-technical changes (typo's or additional clarification) made to the TIAR are reflected via a strike-thru for text that been deleted and underlined when text has been added.

Executive Summary

This report has been prepared to present the results of a Traffic Impact Analysis Report (TIAR) performed by Omni-Means for the proposed River Crossing Marketplace Specific Plan in the City of Redding, California. The subject property is located in the northwest quadrant of the S. Bonnyview Road/Interstate 5 interchange in the City of Redding.

For the purpose of CEQA and this TIAR, the proposed project will be assumed to be developed in one phase.

    - Location: ± 25.16 acres east of Bechelli Lane, north of S. Bonnyview Road, west of I-5, and south of Rivercrest Estates subdivision.
    - Land Use Quantities
        - ± 152,101 sq. ft. Costco
        - ± 70,100 sq. ft. General Commercial Retail
        - 30 fueling positions
- Access to the project will be via three (3) proposed driveways along Bechelli Lane and one (1) proposed driveway along S. Bonnyview Road.
    - One Full-Access unsignalized driveway on Bechelli Lane (northern driveway).
    - One Full-Access signalized driveway on Bechelli Lane at existing Blue Shield Driveway (middle driveway).
    - One unsignalized driveway with ~~Right-In/Right-Out (RIRO) Access~~ three-quarter access (right-in, right-out, and left-out) on Bechelli Lane (southern driveway). (Superseded by the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum in Appendix I.)
    - One unsignalized driveway with RIRO Access on S. Bonnyview Road (S. Bonnyview driveway).

The proposed project's site plan can be found on page ~~37~~ 41.

The full build-out of the proposed project will generate approximately 568 weekday AM, 616 weekday PM, and 1,001 Saturday (mid-day) peak hour trips.

The traffic analysis considered potential impacts (selected in coordination with City staff) at the following intersections:

1. S. Bonnyview Road/Cedar Road & State Route 273
2. S. Bonnyview Road & Eastside Road
3. S. Bonnyview Road & E. Bonnyview Road
4. S. Bonnyview Road & Indianwood Drive
5. S. Bonnyview Road & Bechelli Lane

6A. S. Bonnyview Road & Texaco Driveway

6B. S. Bonnyview Road & S. Bonnyview Driveway (*Plus Project* conditions only)

7. S. Bonnyview Road & Interstate 5 SB Ramps
8. S. Bonnyview Road & Interstate 5 NB Ramps
9. S. Bonnyview Road & Churn Creek Road
10. Churn Creek Road & Alrose Lane
11. Churn Creek Road & Hartmeyer Lane
12. Churn Creek Road & Huntington Drive
13. Churn Creek Road & Victor Avenue
14. Churn Creek Road & Rancho Road
15. Rancho Road & Alta Mesa Drive
16. Rancho Road & Shasta View Drive
17. Rancho Road & Airport Road
18. Bechelli Lane & Blue Shield Driveway/Middle Driveway (*Plus Project* conditions only)
19. Bechelli Lane & Chinook Drive
20. Bechelli Lane & Rivercrest Parkway
21. Bechelli Lane & Loma Vista Drive
22. Bechelli Lane & Hartnell Avenue
23. Churn Creek Road & Public ROW to Chevron
24. Churn Creek Road & Arizona Lane
25. Churn Creek Road & Loma Vista Drive
26. Churn Creek Road & Shirley Lane/Enterprise HS Driveway
27. Churn Creek Road & Hartnell Avenue
28. Bechelli Lane & Northern Driveway (*Plus Project* conditions only)
29. Bechelli Lane & Southern Driveway (*Plus Project* conditions only)

The traffic analysis considered potential impacts (selected in coordination with City staff) along the following arterial corridors:

- S. Bonnyview Road, from State Route 273 to Churn Creek Road
- Churn Creek Road, from S. Bonnyview Road to Victor Avenue
- Rancho Road, from Churn Creek Road to Airport Road
- Bechelli Lane, from S. Bonnyview Road to Chinook Drive (2-lane section)
- Bechelli Lane, from Chinook Drive to 3rd Street (3-lane section)
- Churn Creek Road, from S. Bonnyview Road to Hartnell Avenue
- Churn Creek Road, from Rancho Road to Knighton Road

Consistent with the January 2009 City of Redding Traffic Impact Analysis (TIA) Guidelines, the following traffic scenarios were analyzed as a part of this TIAR:

- *Existing* Conditions
- *Existing Plus Project* Conditions
- *Year 2020 No Project* Conditions
- *Year 2020 Plus Project* Conditions (Project Occupancy Conditions)

- *Year 2040 No Project* Conditions
- *Year 2040 Plus Project* Conditions

The traffic analysis determined that all project impacts will be mitigated through either the payment of a Fair-Share or construction of the recommended mitigations.

The following is a summary of improvements necessary for intersections and roadways to operate at acceptable levels of service:

> ***Note: The improvements identified to meet the level of service standards will not be identical to the improvements required to mitigate the project's CEQA impacts. Where CEQA mitigation is recommended, the mitigation measure (MM) is specifically identified.***

Intersection Improvements to Meet LOS Standards

Intersection 5 - S. Bonnyview Road & Bechelli Lane

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - Widen the southbound approach to provide:
    - Two left-turn lanes of length 325 feet.
    - One shared thru/left-turn lane of length 325 feet.
    - One right-turn lane of length 325 feet.
  - OR Construct a multi-lane roundabout.
- **Year 2040 No Project Conditions**
  - No improvements recommended.
- **Year 2040 Plus Project Conditions**
  - Provide improvements recommended under *Year 2020 Plus Project* conditions, and
  - Widen the eastbound approach to provide
    - One left-turn lane of length 400 feet.
    - Two thru lanes of length 400 feet.
    - One shared thru/right-turn lane of length 350 feet.

  OR

  - Construct a multi-lane roundabout.

Under *Existing Plus Project* conditions, the project does not create a significant impact at this signalized intersection, and the intersection operates acceptably.

Under *Year 2020 Plus Project* conditions, the project creates a significant impact at this signalized intersection by causing the southbound left-turn queue length to spill back to the existing signal at Blue Shield Driveway.

The proposed improvement would provide an additional left-turn pocket to reduce the projected queuing in the existing exclusive left and left/thru lanes on southbound Bechelli Lane. The proposed signal mitigation would improve level of service to acceptable LOS D. The proposed roundabout mitigation would improve level of service to acceptable LOS A.

Under *Year 2040 Plus Project* conditions, the project creates a significant impact at this signalized intersection by causing the LOS to deteriorate from acceptable to unacceptable conditions for both the AM and PM peak hour scenarios.

The proposed signal mitigation would improve level of service to acceptable LOS D. The proposed roundabout mitigation would improve level of service to acceptable LOS B.

The project's Fair-Share is 53%.

MM for Intersection 5 – Prior to occupancy, the project developer shall complete the following improvements:

- ***Widen the southbound approach to provide:***

    - ***Two 325-feet long left-turn lanes.***
    - ***One 325-feet long shared thru/left-turn lane.***
    - ***One 325-feet long right-turn lane.***
- ***Alternatively, construct a multi-lane roundabout.***

Note: Year 2040 Plus Project Conditions impacts will be mitigated through payment of the Citywide Traffic Impact Fee (TIF) since the long-term improvements at this intersection are included in the City's December 5, 2017 impact fee program update.

Exhibits depicting the mitigation measures for Year 2020 and 2040 are included in Appendix G.

Intersection 7 - S. Bonnyview Road & I-5 Southbound Ramps

- **Existing Conditions**
    - No improvements recommended.
- **Existing Plus Project Conditions**
    - Widen the eastbound approach to provide:
        - Two thru lanes that transition into two trap left-turn lanes at the subsequent intersection of S. Bonnyview Road & I-5 NB Ramps.
    - Widen the southbound approach to provide:
        - One shared thru/left-turn lane.
        - Two right-turn lanes (each of length 175 feet).

    OR

    - Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.
- **Year 2020 No Project Conditions**
    - No improvements recommended.
- **Year 2020 Plus Project Conditions**
    - Provide improvements recommended under *Existing Plus Project* conditions, *and*
    - Extend southbound right-turn lanes to 275 feet.

    OR

    - Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.
- **Year 2040 No Project Conditions**
    - No improvements recommended.
- **Year 2040 Plus Project Conditions**
    - Provide improvements recommended under *Existing Plus Project* conditions, *2020 Plus Project* conditions, *and*
    - Widen the westbound approach to provide:
        - Two left-turn lanes.
    - Extend southbound right-turn lanes and thru/left pocket to 400 feet.

    OR

    - Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.

Under *Existing Plus Project, Year 2020 Plus Project* and *Year 2040 Plus Project* conditions, the project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable for both the AM and PM peak hour scenarios.

The proposed signal mitigation would improve the level of service to an acceptable LOS B for Existing Plus Project, acceptable LOS C for Year 2020 Plus Project, and an acceptable LOS D for Year 2040 Plus Project. The proposed diverging diamond interchange mitigation would improve the level of service to an acceptable LOS B for Year 2020 Plus Project and an acceptable LOS C for Year 2040 Plus Project.

The project's Fair-Share is 48%.

> ***MM for Intersection 7 – Prior to occupancy, the project developer shall complete the following improvements:***
> - ***Widen the eastbound approach to provide:***
>   - ***Two thru lanes that become left-turn lanes at the next easterly intersection of S. Bonnyview Road and I-5 NB Ramps.***
> - ***Widen the southbound Interstate 5 off-ramp approach to provide:***
>   - ***One shared thru/left-turn lane.***
>   - ***Two 275-feet long right-turn lanes.***
> - ***<u>Alternatively, construct a diverging diamond interchange</u>***
>
> ***Note: Year 2040 Plus Project Conditions impacts will be mitigated through payment of the Citywide Traffic Impact Fee (TIF) since the long-term improvements at this intersection are included in the City's December 5, 2017 impact fee program update. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Public Facilities Fee and the Shasta County Major Road Impact Fee Program.***

Exhibits depicting the mitigation measures for Year 2020 and 2040 are included in Appendix G.

Intersection 8 - S. Bonnyview Road & I-5 Northbound Ramps

- **<u>Existing Conditions</u>**
  - No improvements recommended.
- **<u>Existing Plus Project Conditions</u>**
  - Widen the eastbound approach to provide:
    - An additional eastbound left-turn lane.
  - Widen the northbound approaches to provide:
    - ~~One left-turn lane of length 285 feet.~~
    - One shared thru/left-turn lane of length ~~285~~ <u>300</u> feet.
    - One right-turn lane of length ~~285~~ <u>300</u> feet.

  OR

  - Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.
- **<u>Year 2020 No Project Conditions</u>**
  - No improvements recommended.
- **<u>Year 2020 Plus Project Conditions</u>**
  - Provide improvements recommended under *Existing Plus Project* conditions, ~~*and*~~

  OR

  - Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.
- **<u>Year 2040 No Project Conditions</u>**
  - No improvements recommended.

- **Year 2040 Plus Project Conditions**
  - Provide improvements recommended under *Existing Plus Project* conditions,
  - Add Northbound left-turn lane *and*
  - Extend all northbound turn lanes to 500 feet.

  OR

  - Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.

Under *Existing Plus Project* and *Year 2040 Plus Project* conditions, the project creates a significant impact at this signalized intersection by causing the LOS to deteriorate from acceptable to unacceptable for both the AM and PM peak hour scenarios.

The proposed signal mitigation would improve level of service to acceptable LOS C for Existing Plus Project, acceptable LOS C for Year 2020 Plus Project, and acceptable LOS C for Year 2040 Plus Project. The proposed diverging diamond interchange mitigation would improve the level of service to an acceptable LOS B for Existing Plus Project and an acceptable LOS C for Year 2040 Plus Project.

The project's Fair-Share is 22%.

MM for Intersection 8 – Prior to occupancy, the project developer shall complete the following improvements:

- ***Widen the eastbound approach to provide:***
  - ***Two left-turn lanes.***
- ***Widen the northbound Interstate 5 off-ramp approach to provide:***
  - ***One 285-feet long left-turn lane.***
  - ***One 285-feet long shared thru/left-turn lane.***
  - ***One 285-feet long right-turn lane.***
- ***Alternatively, construct a diverging diamond interchange***

Note: Year 2040 Plus Project Conditions impacts will be mitigated through payment of the Citywide TIF since the long-term improvements at this intersection are included in the City's December 5, 2017 impact fee program update. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Public Facilities Fee and the Shasta County Major Road Impact Fee Program.

Exhibits depicting the mitigation measures for Year 2020 and 2040 are included in Appendix G.

Intersection 11 - Churn Creek Road & Hartmeyer Lane

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - No improvements recommended.
- **Year 2040 No Project Conditions**
  - No improvements recommended.
- **Year 2040 Plus Project Conditions**

- Reconstruct intersection to achieve the following:
  - Eliminate westbound left-turn movement.
  - Provide a receiving lane on westbound Churn Creek Road for northbound left-turns.
  - Provide a northbound right-turn lane.
  - Widen the adjacent bridge to accommodate intersection improvements.

Under the *Existing Plus Project* and *Year 2020 Plus Project* conditions, the project does not create any significant impacts at this unsignalized intersection.

Under the *Year 2040 Plus Project* conditions, the proposed project creates a significant impact by increasing the delay by more than 5 seconds per vehicle and meeting the peak hour traffic signal warrant at an intersection operating at an unacceptable LOS in the weekday PM peak hour.

After the mitigations stated above, the mitigated LOS is projected to be LOS C.

The project's Fair-Share is 13%.

> ***MM for Intersection 11 - Prior to issuance of each Certificate of Occupancy for the project, the developer shall pay an ad-hoc fee for the future improvements required at the Churn Creek Road and Hartmeyer Road intersection. Payment shall be made into a newly formed City of Redding account in an amount equal to thirteen (13) percent of the cost of the required improvements. The amount paid at the time of issuance of each individual Certificate of Occupancy will be the proportionate share of the amount of building square footage of requested Certificate of Occupancy to the total approved by the project. (i.e., Cost of Improvements x 13 percent/total project square footage = price per square foot x square footage of requested Certificate of Occupancy). These improvements include reconstructing the intersection to accommodate northbound lefts by providing a protected merge lane and a northbound right-turn pocket.***
>
> ***Note: Payment of an ad-hoc fee is recommended since this intersection is not in the Citywide TIF program. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Major Road Impact Fee Program.***

An exhibit depicting the mitigation measure for Year 2040 is included in Appendix G.

Intersection 12 - Churn Creek Road & Huntington Drive

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - No improvements recommended.
- **Year 2040 No Project Conditions**
  - No improvements recommended.
- **Year 2040 Plus Project Conditions**
  - Reconstruct the intersection to achieve the following:

- A two-way-left-turn lane (TWLTL) along eastbound-westbound Churn Creek Road

Under the *Existing Plus Project* and *Year 2020 Plus Project* conditions, the project does not create any significant impacts at this unsignalized intersection.

Under the Year 2040 Plus Project conditions, the proposed project creates a significant impact by increasing the delay by more than 5 seconds per vehicle and meeting the peak hour traffic signal warrant at an intersection operating at unacceptable LOS in the Saturday mid-day peak hour.

After the mitigations stated above, the mitigated LOS is projected to be LOS C.

The project's Fair-Share is 22%.

> ***MM for Intersection 12 - Prior to issuance of each Certificate of Occupancy for the project, the developer shall pay an ad-hoc fee for the future improvements required on Churn Creek Road, from the bridge over Churn Creek to Victor Avenue. Payment shall be made into a newly formed City of Redding account in an amount equal to twenty-two (22) percent of the cost of the required improvements. The amount paid at the time of issuance of each individual Certificate of Occupancy will be the proportionate share of the amount of building square footage of requested Certificate of Occupancy to the total approved by the project. (i.e., Cost of Improvements x 22 percent/total project square footage = price per square foot x square footage of requested Certificate of Occupancy). These improvements include reconstructing the roadway to provide a two-way-left-turn-lane (TWLTL).***
>
> ***Note: Payment of an ad-hoc fee is recommended since this intersection is not in the Citywide TIF program. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Major Road Impact Fee Program.***

An exhibit depicting the mitigation measure for Year 2040 is included in Appendix G.

Intersection 13 - Churn Creek Road & Victor Avenue

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - Construct a southbound right-turn pocket.
- **Year 2040 No Project Conditions**
  - Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single lane roundabout.
- **Year 2040 Plus Project Conditions**
  - Provide improvements recommended under *Year 2040 No Project* conditions.

Under the *Existing Plus Project* conditions, the project does not create any significant impacts at this unsignalized intersection.

Under the *Year 2020 Plus Project* and *Year 2040 Plus Project* conditions, the proposed project creates a significant impact by increasing the delay by more than 5 seconds per vehicle and meeting the peak hour traffic signal warrant at an intersection operating at an unacceptable LOS in the weekday AM, PM, and Saturday mid-day peak hours.

The proposed mitigation would improve the level of service to an acceptable LOS D for Year 2020 Plus Project, and an acceptable LOS B for Year 2040 Plus Project.

The project's Fair-Share is 25%.

> ***MM for Intersection 13 – Prior to issuance of each Certificate of Occupancy for the project, the developer shall pay the Citywide TIF.***
>
> ***Note: Year 2040 Plus Project Conditions impacts will be mitigated through payment of the Citywide TIF since the long-term improvements at this intersection are included in the City's December 5, 2017 impact fee program update. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Major Road Impact Fee Program.***

An exhibit depicting the mitigation measure for Year 2040 is included in Appendix G.

Intersection 14 - Churn Creek Road & Rancho Road

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - Construct a southbound right-turn pocket.
- **Year 2040 No Project Conditions**
  - Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single lane roundabout.
- **Year 2040 Plus Project Conditions**
  - Provide improvements recommended under *Year 2040 No Project* conditions.

Under *Existing Plus Project* conditions, the project does not create any significant impacts at this unsignalized intersection.

Under the *Year 2020 Plus Project* and *Year 2040 Plus Project* conditions, the proposed project creates a significant impact by increasing the delay by more than 5 seconds per vehicle and meeting the peak hour traffic signal warrant at an intersection operating at unacceptable LOS in the weekday AM and PM peak hours.

The proposed mitigation would improve level of service to acceptable LOS C for *Year 2020 Plus Project*, and acceptable LOS B for *Year 2040 Plus Project*.

The project's Fair-Share is 14%.

> ***MM for Intersection 14 – Prior to issuance of each Certificate of Occupancy for the project, the developer shall pay the Citywide TIF.***

Note: Year 2040 Plus Project Conditions impacts will be mitigated through payment of the Citywide TIF since the long-term improvements at this intersection are included in the City's December 5, 2017 impact fee program update. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Major Road Impact Fee Program.

An exhibit depicting the mitigation measure for Year 2040 is included in Appendix G.

Intersection 21 - Bechelli Lane & Loma Vista Drive

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - No improvements recommended.
- **Year 2040 No Project Conditions**
  - No improvements recommended.
- **Year 2040 Plus Project Conditions**
  - Construct a traffic signal with split phasing for the eastbound and westbound approaches, and protected left-turn movements on northbound and southbound approaches.

    OR

  - Construct a 4-leg, single-lane roundabout.

Under *Existing Plus Project* and *Year 2020 Plus Project* conditions, the project does not create any significant impacts at this unsignalized intersection.

Under *Year 2040 Plus Project* conditions, the project creates a significant impact by both increasing the delay by more than 5 seconds per vehicle and meeting the peak hour signal warrant for both the AM and PM peak hours.

After the mitigations stated above, the mitigated LOS is projected to be LOS C for the signal alternative and LOS B for the single-lane roundabout alternative.

The project's Fair-Share is 11%.

MM for Intersection 21 - Prior to issuance of each Certificate of Occupancy for the project, the developer shall pay an ad-hoc fee for the future improvements required at the Bechelli Lane and Loma Vista Drive intersection. Payment shall be made into a newly formed City of Redding account in an amount equal to eleven (11) percent of the cost of the required improvements. The amount paid at the time of issuance of each individual Certificate of Occupancy will be the proportionate share of the amount of building square footage of requested Certificate of Occupancy to the total approved by the project. (i.e., Cost of Improvements x 11 percent/total project square footage = price per square foot x square footage of requested Certificate of Occupancy). These improvements include construction of a traffic signal.

Note: Payment of an ad-hoc fee is recommended since this intersection is not in the Citywide TIF program.

An exhibit depicting the signal mitigation measure for Year 2040 is included in Appendix G.

Roadway Improvements to Meet LOS Standards

Segment 1 - S. Bonnyview Road (from SR 273 to Churn Creek Road)

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - No improvements recommended.
- **Year 2040 No Project Conditions**
  - No improvements recommended.
- **Year 2040 Plus Project Conditions**
  - Construct the improvements identified for *Year 2040 Plus Project* at Intersections 5, 7, and 8 to provide acceptable roadway operations.

Under the *Existing Plus Project* and *Year 2020 Plus Project*, the project does not create significant impacts on S. Bonnyview Road between SR 273 and Churn Creek Road.

Under *Year 2040 Plus Project* conditions, the project creates a significant impact by causing the average arterial speed to decrease by more than 5% at a roadway operating unacceptably.

The project's Fair-Share is 62%.

MM for Roadway Segment 1 – The project developer shall complete the previously identified ~~improvements~~ mitigation measures for Intersections 5, 7 and 8. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Public Facilities Fee and the Shasta County Major Road Impact Fee Program.

Exhibits depicting the mitigation measures for Year 2040 are included in Appendix G.

Segment 2 - Churn Creek Road (from S. Bonnyview Road to Victor Avenue)

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - Improvements to Intersection 11 - Churn Creek Road & Hartmeyer Lane:
    - Eliminate westbound left movement.
    - Provide a receiving lane on westbound Churn Creek Road for northbound left-turns from Hartmeyer Lane.
    - Provide northbound right-turn lane.

        - Widen adjacent bridge to accommodate intersection improvements.
    - Improvements to Intersection 12 - Churn Creek Road & Huntington Drive:
        - ~~Provide~~ Construct a Two-Way-Left-Turn-Lane (TWLTL), from approximately the bridge over Churn Creek to intersections 13 & 14 ~~along eastbound-westbound Churn Creek Road~~.
        - OR Construct a TWLTL, from approximately the bridge over Churn Creek to intersections 13 & 14, however, eliminate left-turns at Huntington Drive, close gap in Huntington Drive, and construct a compact roundabout at Victor Avenue/El Verano Drive intersection.
    - Improvements to Intersections 13 & 14 (Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road):
        - Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single-lane roundabout.
- **Year 2040 No Project Conditions**
    - Construct a TWLTL, from approximately the bridge over Churn Creek to intersections 13 & 14, with a single-lane roundabout at the Huntington Drive Intersection.
    - OR Construct a TWLTL, from approximately the bridge over Churn Creek to intersections 13 & 14, however, eliminate left-turns at Huntington Drive, close gap in Huntington Drive, and construct a compact roundabout at the Victor Avenue/El Verano Drive Intersection
    - OR Construct a 5-lane roadway
- **Year 2040 Plus Project Conditions**
    - Project does not create a significant impact. No improvements recommended.

Under the *Year 2020 Plus Project,* the project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable.

> ***MM for Roadway Segment 2 – The project developer shall implement the previously identified improvements for Intersections 11, 12, 13 and 14. The Year 2040 Plus Project Conditions impacts are also mitigated via regional developments through the Shasta County Public Facilities Fee and the Shasta County Major Road Impact Fee Program.***

Exhibits depicting the mitigation measures for Year 2020 and 2040 are included in Appendix G.

Segment 4 – Bechelli Lane (from S. Bonnyview Road to Chinook Drive)

- **Existing Conditions**
    - No improvements recommended.
- **Existing Plus Project Conditions**
    - No improvements recommended.
- **Year 2020 No Project Conditions**
    - No improvements recommended.
- **Year 2020 Plus Project Conditions**
    - No improvements recommended.
- **Year 2040 No Project Conditions**
    - No improvements recommended.
- **Year 2040 Plus Project Conditions**
    - Construct a TWLTL on Bechelli Lane from Chinook Drive to Northern Driveway.

Under the *Existing Plus Project* and *Year 2020 Plus Project* Conditions, the proposed project does not create significant impacts on this roadway segment.

Under *Year 2040 Plus Project* conditions, the project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable.

The project's Fair-Share is 50%.

MM for Roadway Segment 4 - Prior to occupancy, the following improvement shall be completed by the project developer:

- ***Restripe Bechelli Lane, from the project's Northern Driveway to Chinook Drive, to provide a TWLTL.***

Freeway Mainline Segments and Ramps – Improvements to Meet LOS Standards

Segment 8 - I-5 SB Knighton Road Off Ramp (Diverge)

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - No improvements recommended.
- **Year 2040 No Project Conditions**
  - No improvements recommended.
- **Year 2040 Plus Project Conditions**
  - Widen the mainline segment from two (2) lanes to three (3) lanes in each direction.

Under the *Existing Plus Project* and *Year 2020 Plus Project* Conditions, the proposed project does not create significant impacts on this freeway mainline segment.

Under the Year 2040 Plus Project Conditions, the proposed project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable.

The project's Fair-Share is 10%.

MM for Segment 8 – None.

Note: At the time of this writing, Caltrans and the Shasta Regional Transportation Agency (SRTA) have programmed a project to construct the recommended improvement. The project is planned to be completed in 2021. Additional information can be found at: https://dot.ca.gov/caltrans-near-me/district-2/d2-projects/d2-redding-to-anderson-six-lanes-rasl

Segment 9 - I-5 SB from S. Bonnyview Road to Knighton Road

- **Existing Conditions**
  - No improvements recommended.
- **Existing Plus Project Conditions**
  - No improvements recommended.
- **Year 2020 No Project Conditions**
  - No improvements recommended.
- **Year 2020 Plus Project Conditions**
  - No improvements recommended.
- **Year 2040 No Project Conditions**
  - Widen the mainline segment from two (2) lanes to three (3) lanes in each direction.
- **Year 2040 Plus Project Conditions**
  - Widen the mainline segment from two (2) lanes to three (3) lanes in each direction.

Under the *Existing Plus Project* and *Year 2020 Plus Project* Conditions, the proposed project does not create significant impacts on this freeway mainline segment.

Under the Year 2040 Plus Project Conditions, the proposed project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable.

The project's Fair-Share is 10%.

MM for Segment 9 – None.

Note: At the time of this writing, Caltrans and the Shasta Regional Transportation Agency (SRTA) have programmed a project to construct the recommended improvement. The project is planned to be completed in 2021. Additional information can be found at: https://dot.ca.gov/caltrans-near-me/district-2/d2-projects/d2-redding-to-anderson-six-lanes-rasl

EXECUTIVE SUMMARY TABLE 1
COSTCO WHOLESALE TRAFFIC IMPACT ANALYSIS REPORT
SUMMARY OF INTERSECTION OPERATIONS

SUMMARY OF INTERSECTION OPERATIONS	S. Bonnyview Rd/ Cedars Rd & SR 273			S. Bonnyview Rd/ Eastside Rd			S. Bonnyview Rd/ E. Bonnyview Rd			S. Bonnyview Rd/ Indianwood Dr			S. Bonnyview Rd/ Bechelli Ln			S. Bonnyview Rd/ Texaco Dwy			S. Bonnyview Rd/ I-5 SB Ramps			S. Bonnyview Rd/ I-5 NB Ramps			S. Bonnyview Rd/ Churn Creek Rd			Churn Creek Rd/ Alrose Ln			Churn Creek Rd/ Hartmeyer Ln			Churn Creek Rd/ Huntington Dr			Churn Creek Rd/ Victor Ave			Churn Creek Rd/ Rancho Rd		
Intersection Number	**1**			**2**			**3**			**4**			**5**			**6A**			**7**			**8**			**9**			**10**			**11**			**12**			**13**			**14**		
Control Type	Signal			Signal			Signal			Signal			Signal			TWSC			Signal			Signal			Signal			TWSC			TWSC			TWSC			TWSC			TWSC		
Target LOS	D			D			D			D			D			D			D			D			D			D			E			D			D			C		
AM PEAK HOUR	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**
Existing	C	32.7	-	C	30.3	-	C	25.4	-	A	4.6	-	B	17.8	-	C	17.7	-	C	24.5	-	D	43.3	-	C	20.5	-	B	12.0	-	C	19.5	-	C	23.8	-	C	18.2	-	C	15.6	-
Existing Plus Project	D	35.6	-	C	31.2	-	C	28.8	-	A	4.8	-	C	26.7	-	C	21.1	-	**E**	**62.3**	**Not Ok**	**E**	**73.0**	**Not Ok**	C	20.8	-	B	12.3	-	C	21.4	-	D	26.5	-	C	20.5	-	C	16.9	-
Delay Increase Due to Project		2.9			0.9			3.4			0.2			8.9			3.4			37.8			29.7			0.3			0.3			1.9			2.7			2.3			1.3	
Significant Impact?		No			No			No			No			No			No			**Yes**			**Yes**			No			No			No			No			No			No	
Year 2020 Base No Project	D	36.0	-	C	31.9	-	C	33.8	-	A	6.1	-	C	20.1	-	C	16.9	-	C	29.6	-	C	30.1	-	C	31.1	-	B	13.3	-	C	23.3	-	D	28.4	-	D	26.9	-	C	21.2	-
Year 2020 Base Plus Project	D	36.7	-	C	33.0	-	D	38.4	-	A	6.3	-	C	34.9	**Not Ok**	C	19.3	-	**E**	**63.7**	**Not Ok**	D	39.0	-	C	31.1	-	B	13.8	-	D	25.9	-	D	32.5	-	D	32.8	-	C	24.3	-
Delay Increase Due to Project		0.7			1.1			4.6			0.2			14.8			2.4			34.1			8.9			0.0			0.5			2.6			4.1			5.9			3.1	
Significant Impact?		No			No			No			No			**Yes**			No			**Yes**			No			No			No			No			No			No			No	
Year 2040 Base No Project	D	38.6	-	D	36.8	-	C	33.9	-	A	6.8	-	C	23.3	-	C	17.9	-	D	43.9	-	D	46.0	-	D	35.9	-	B	14.1	-	**F**	**52.3**	**Ok**	**E**	**39.3**	**Ok**	**F**	**60.7**	**Not Ok**	**E**	**36.0**	**Not Ok**
Year 2040 Base Plus Project	D	39.9	-	D	39.1	-	D	40.9	-	A	7.0	-	**E**	**58.6**	**Not Ok**	C	20.5	-	**F**	**83.5**	**Not Ok**	**E**	**59.2**	**Not Ok**	D	36.7	-	B	14.5	-	**F**	**61.6**	**Ok**	**E**	**45.8**	**Ok**	**F**	**84.5**	**Not Ok**	**E**	**45.7**	**Not Ok**
Delay Increase Due to Project		1.3			2.3			7.0			0.2			35.3			2.6			39.6			13.2			0.8			0.4			9.3			6.5			23.8			9.7	
Significant Impact?		No			No			No			No			**Yes**			No			**Yes**			**Yes**			No			No			No			No			**Yes**			**Yes**	
PM PEAK HOUR																																										
Existing	C	31.6	-	D	35.3	-	C	29.0	-	A	7.8	-	C	21.2	-	C	16.5	-	B	18.6	-	C	27.5	-	C	22.5	-	C	15.7	-	C	21.3	-	C	19.5	-	D	29.2	-	C	16.2	-
Existing Plus Project	C	32.1	-	D	36.9	-	C	29.7	-	A	8.3	-	D	40.8	-	C	22.4	-	**E**	**74.4**	**Not Ok**	**E**	**67.5**	**Ok**	C	22.6	-	C	16.4	-	C	23.9	-	C	21.5	-	**E**	**37.3**	**Not Ok**	C	17.8	-
Delay Increase Due to Project		0.5			1.6			0.7			0.5			19.6			5.9			55.8			40.0			0.1			0.7			2.6			2.0			8.1			1.6	
Significant Impact?		No			No			No			No			No			No			**Yes**			**Yes**			No			No			No			No			No			No	
Year 2020 Base No Project	C	34.6	-	D	38.7	-	C	31.0	-	A	8.0	-	C	21.6	-	C	19.1	-	C	21.0	-	C	24.5	-	C	30.3	-	C	20.3	-	D	27.7	-	C	20.3	-	**F**	**53.7**	**Not Ok**	C	21.8	-
Year 2020 Base Plus Project	D	35.2	-	D	40.8	-	C	32.5	-	A	8.6	-	D	46.2	**Not Ok**	D	26.6	-	**E**	**75.2**	**Not Ok**	C	30.9	-	C	30.4	-	C	21.6	-	D	31.7	-	C	22.3	-	**F**	**78.7**	**Not Ok**	**D**	**25.7**	**Not Ok**
Delay Increase Due to Project		0.6			2.1			1.5			0.6			24.6			7.5			54.2			6.4			0.1			1.3			4.0			2.0			25.0			3.9	
Significant Impact?		No			No			No			No			**Yes**			No			**Yes**			No			No			No			No			No			**Yes**			No	
Year 2040 Base No Project	D	38.8	-	D	48.8	-	D	41.9	-	A	9.5	-	C	27.3	-	C	24.6	-	D	41.8	-	C	29.6	-	C	33.5	-	C	23.9	-	**F**	**81.7**	**Not Ok**	D	32.9	-	**F**	**OVR**	**Not Ok**	**F**	**52.6**	**Not Ok**
Year 2040 Base Plus Project	D	39.3	-	D	50.9	-	D	45.7	-	B	10.2	-	**E**	**76.3**	**Not Ok**	**E**	**35.8**	**Ok**	**F**	**114.7**	**Not Ok**	D	40.9	-	C	33.7	-	D	25.7	-	**F**	**107.3**	**Not Ok**	**E**	**37.1**	**Ok**	**F**	**OVR**	**Not Ok**	**F**	**72.2**	**Not Ok**
Delay Increase Due to Project		0.5			2.1			3.8			0.7			49.0			11.2			72.9			11.3			0.2			1.8			25.6			4.2			Delay>5			19.6	
Significant Impact?		No			No			No			No			**Yes**			No			**Yes**			No			No			No			**Yes**			No			**Yes**			**Yes**	
SATURDAY PEAK HOUR																																										
Existing	C	26.8	-	C	21.5	-	B	13.3	-	A	5.1	-	B	14.3	-	B	11.5	-	B	14.6	-	C	26.1	-	C	21.0	-	B	12.9	-	B	13.4	-	B	14.3	-	B	14.9	-	B	10.6	-
Existing Plus Project	C	27.1	-	C	22.4	-	B	13.7	-	A	5.1	-	C	25.6	-	C	15.0	-	C	25.9	-	D	38.9	-	C	21.1	-	B	13.7	-	C	15.2	-	C	16.4	-	C	17.8	-	B	11.1	-
Delay Increase Due to Project		0.3			0.9			0.4			0.0			11.3			3.5			11.3			12.8			0.1			0.8			1.8			2.1			2.9			0.5	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No			No	
Year 2020 Base No Project	C	27.2	-	C	22.7	-	B	14.5	-	A	6.9	-	B	15.0	-	B	12.8	-	B	17.5	-	C	23.1	-	C	28.8	-	B	14.3	-	B	14.9	-	C	18.6	-	C	18.5	-	B	11.8	-
Year 2020 Base Plus Project	C	27.6	-	C	23.7	-	B	15.0	-	A	7.4	-	C	26.3	**Not Ok**	C	17.0	-	C	26.6	-	C	25.1	-	C	29.0	-	C	15.3	-	C	16.9	-	C	22.4	-	C	23.7	-	B	12.5	-
Delay Increase Due to Project		0.4			1.0			0.5			0.5			11.3			4.2			9.1			2.0			0.2			1.0			2.0			3.8			5.2			0.7	
Significant Impact?		No			No			No			No			**Yes**			No			No			No			No			No			No			No			No			No	
Year 2040 Base No Project	C	28.9	-	C	24.8	-	B	17.3	-	A	7.7	-	B	16.1	-	B	14.2	-	B	18.3	-	C	25.1	-	C	28.9	-	B	14.8	-	C	19.8	-	**E**	**36.0**	**Not Ok**	D	32.8	-	B	13.5	-
Year 2040 Base Plus Project	C	29.4	-	C	25.7	-	B	17.8	-	A	7.9	-	C	31.6	-	C	19.4	-	C	32.7	-	C	27.9	-	C	28.6	-	C	15.9	-	C	23.2	-	**F**	**52.1**	**Not Ok**	**F**	**54.2**	**Not Ok**	B	14.9	-
Delay Increase Due to Project		0.5			0.9			0.5			0.2			15.5			5.2			14.4			2.8			-0.3			1.1			3.4			16.1			21.4			1.4	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			**Yes**			**Yes**			No	
Fair Share	**N/A**			**N/A**			**N/A**			**N/A**			**53%**			**N/A**			**48%**			**22%**			**N/A**			**N/A**			**13%**			**22%**			**25%**			**14%**		

Notes:

LOS - Level of Service

TWSC = Two Way Stop Control

Red = Unacceptable Conditions

OVR = Delays exceeds 300 seconds

** - Due to vehicle queue increases*

EXECUTIVE SUMMARY TABLE 1
COSTCO WHOLESALE TRAFFIC IMPACT ANALYSIS REPORT
SUMMARY OF INTERSECTION OPERATIONS

SUMMARY OF INTERSECTION OPERATIONS	Rancho Rd/ Alta Mesa Dr			Rancho Rd/ Shasta View Dr			Rancho Rd/ Airport Rd			Bechelli Ln/ Blue Shield Dwy			Bechelli Ln/ Chinook Dr			Bechelli Ln/ Rivercrest Pkwy			Bechelli Ln/ Loma Vista Dr			Bechelli Ln/ Hartnell Ave			Churn Creek Rd/ Public ROW to Chevron			Churn Creek Rd/ Arizona Ln			Churn Creek Rd/ Loma Vista Dr			Churn Creek Rd/Shirley Ln & Enterprise HS Dwy			Churn Creek Rd/ Hartnell Ave		
Intersection Number	**15**			**16**			**17**			**18**			**19**			**20**			**21**			**22**			**23**			**24**			**25**			**26**			**27**		
Control Type	TWSC			TWSC			Signal			Signal			TWSC			TWSC			TWSC			Signal			TWSC			TWSC			Signal			Signal			Signal		
Target LOS	C			C			C			C			C			C			C			C			C			C			C			C			C		
AM PEAK HOUR	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**
Existing	B	13.0	-	C	15.7	-	B	18.9	-	A	6.9	-	B	12.0	-	B	13.8	-	**D**	**31.2**	**Not Ok**	C	32.8	-	B	13.0	-	B	11.6	-	B	16.2	-	C	31.4	-	**D**	**39.6**	**Not Ok**
Existing Plus Project	B	13.6	-	C	18.5	-	C	20.1	-	B	18.7	-	B	12.3	-	B	14.4	-	**E**	**39.8**	**Not Ok**	C	32.9	-	B	13.3	-	B	11.8	-	B	16.5	-	C	31.5	-	**D**	**40.5**	**Not Ok**
Delay Increase Due to Project		0.6			2.8			1.2			11.8			0.3			0.6			8.6			0.1			0.3			0.2			0.3			0.1			0.9	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No	
Year 2020 Base No Project	C	15.3	-	C	21.0	-	C	29.9	-	A	7.3	-	B	12.7	-	C	15.3	-	**F**	**69.5**	**Not Ok**	C	33.1	-	B	14.8	-	B	12.6	-	B	18.6	-	C	33.9	-	**D**	**43.3**	**Not Ok**
Year 2020 Base Plus Project	C	16.1	-	C	23.2	-	C	32.8	-	B	19.5	-	B	13.0	-	C	16.0	-	**F**	**105.3**	**Not Ok**	C	33.4	-	B	18.1	-	B	12.8	-	B	18.8	-	C	34.2	-	**D**	**44.6**	**Not Ok**
Delay Increase Due to Project		0.8			2.2			2.9			12.2			0.3			0.7			35.8			0.3			3.3			0.2			0.2			0.3			1.3	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No	
Year 2040 Base No Project	C	17.1	-	**F**	**114.8**	**Not Ok**	**D**	**37.5**	**Not Ok**	A	7.5	-	B	13.6	-	C	15.6	-	**F**	**80.1**	**Not Ok**	C	34.9	-	B	16.6	-	B	13.9	-	C	21.3	-	C	34.1	-	**E**	**56.8**	**Not Ok**
Year 2040 Base Plus Project	C	18.1	-	**F**	**143.6**	**Not Ok**	**D**	**41.0**	**Not Ok**	B	19.7	-	B	14.0	-	C	16.3	-	**F**	**116.9**	**Not Ok**	C	34.7	-	B	18.3	-	B	14.1	-	C	21.6	-	C	34.6	-	**E**	**59.7**	**Not Ok**
Delay Increase Due to Project		1.0			28.8			3.5			12.2			0.4			0.7			36.8			-0.2			1.7			0.2			0.3			0.5			2.9	
Significant Impact?		No			No			No			No			No			No			Yes			No			No			No			No			No			No	
PM PEAK HOUR																																								
Existing	B	11.7	-	B	12.0	-	C	21.4	-	A	5.8	-	B	13.1	-	B	12.4	-	**E**	**35.6**	**Ok**	C	30.7	-	B	14.6	-	B	10.8	-	B	12.6	-	B	12.8	-	**D**	**42.3**	**Not Ok**
Existing Plus Project	B	11.9	-	B	12.3	-	C	25.0	-	C	22.9	-	B	13.5	-	B	13.1	-	**E**	**44.5**	**Not Ok**	C	30.8	-	C	15.0	-	B	10.9	-	B	13.5	-	B	12.9	-	**D**	**43.4**	**Not Ok**
Delay Increase Due to Project		0.2			0.3			3.6			17.1			0.4			0.7			8.9			0.1			0.4			0.1			0.9			0.1			1.1	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No	
Year 2020 Base No Project	B	12.3	-	B	12.9	-	C	21.8	-	A	6.1	-	B	13.3	-	B	12.9	-	**E**	**44.8**	**Ok**	C	31.5	-	C	20.4	-	B	11.2	-	B	14.0	-	B	14.0	-	**D**	**47.2**	**Not Ok**
Year 2020 Base Plus Project	B	12.6	-	B	13.3	-	C	25.9	-	C	23.5	-	B	13.7	-	B	13.6	-	**F**	**59.1**	**Not Ok**	C	31.6	-	C	23.8	-	B	11.4	-	B	14.2	-	B	14.4	-	**D**	**48.4**	**Not Ok**
Delay Increase Due to Project		0.3			0.4			4.1			17.4			0.4			0.7			14.3			0.1			3.4			0.2			0.2			0.4			1.2	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No	
Year 2040 Base No Project	B	14.6	-	**F**	**63.0**	**Not Ok**	C	23.6	-	A	6.4	-	C	15.8	-	C	15.1	-	**F**	**OVR**	**Not Ok**	C	34.8	-	C	20.5	-	B	13.2	-	B	17.2	-	B	14.3	-	**E**	**58.5**	**Not Ok**
Year 2040 Base Plus Project	C	15.1	-	**F**	**89.6**	**Not Ok**	C	26.4	-	C	24.8	-	C	16.2	-	C	15.9	-	**F**	**OVR**	**Not Ok**	C	34.9	-	C	24.1	-	B	13.4	-	B	17.5	-	B	14.5	-	**E**	**60.4**	**Not Ok**
Delay Increase Due to Project		0.5			26.6			2.8			18.4			0.4			0.8			Delay>5			0.1			3.6			0.2			0.3			0.2			1.9	
Significant Impact?		No			No			No			No			No			No			Yes			No			No			No			No			No			No	
SATURDAY PEAK HOUR																																								
Existing	B	10.5	-	B	10.6	-	B	12.8	-	A	2.6	-	B	10.6	-	B	10.2	-	B	12.6	-	C	21.3	-	B	11.3	-	A	9.9	-	B	13.4	-	A	7.2	-	C	28.5	-
Existing Plus Project	B	10.9	-	B	11.0	-	B	13.9	-	C	20.2	-	B	11.0	-	B	10.7	-	B	13.9	-	C	21.4	-	B	11.8	-	B	10.1	-	B	14.0	-	A	7.3	-	C	29.5	-
Delay Increase Due to Project		0.4			0.4			1.1			17.6			0.4			0.5			1.3			0.1			0.5			0.2			0.6			0.1			1.0	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No	
Year 2020 Base No Project	B	11.0	-	B	11.2	-	B	16.7	-	A	3.2	-	B	10.8	-	B	10.6	-	B	13.8	-	C	22.3	-	B	19.2	-	B	10.4	-	B	13.5	-	A	9.3	-	C	30.5	-
Year 2020 Base Plus Project	B	11.6	-	B	11.7	-	B	16.9	-	C	21.2	-	B	11.2	-	B	11.2	-	C	15.5	-	C	22.5	-	B	19.5	-	B	10.6	-	B	14.2	-	B	10.5	-	C	31.5	-
Delay Increase Due to Project		0.6			0.5			0.2			18.0			0.4			0.6			1.7			0.2			0.3			0.2			0.7			1.2			1.0	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No	
Year 2040 Base No Project	B	12.2	-	C	19.1	-	B	17.7	-	A	4.7	-	B	12.4	-	B	11.4	-	C	19.8	-	C	24.3	-	B	19.4	-	B	11.7	-	B	14.7	-	B	11.0	-	C	33.1	-
Year 2040 Base Plus Project	B	12.9	-	C	22.0	-	B	18.2	-	C	22.3	-	B	12.9	-	B	12.1	-	C	24.0	-	C	24.4	-	C	24.4	-	B	12.0	-	B	15.4	-	B	11.2	-	C	34.1	-
Delay Increase Due to Project		0.7			2.9			0.5			17.6			0.5			0.7			4.2			0.1			5.0			0.3			0.7			0.2			1.0	
Significant Impact?		No			No			No			No			No			No			No			No			No			No			No			No			No	
Fair Share	**N/A**			**N/A**			**N/A**			**N/A**			**N/A**			**N/A**			**11%**			**N/A**			**N/A**			**N/A**			**N/A**			**N/A**			**N/A**		

Notes:

LOS - Level of Service

TWSC = Two Way Stop Control

Red = Unacceptable Conditions

OVR = Delays exceeds 300 seconds

EXISTING PLUS PROJECT CONDITIONS MITIGATION

***Intersection 7- S. Bonnyview Road & Interstate 5 SB Ramps*:**
- Widen the eastbound approach to provide:
  - Two thru lanes that transition into two trap left turn lanes at the subsequent intersection of S. Bonnyview Road & I-5 NB Ramps
- Widen the southbound approach to provide:
  - a shared thru/left turn lane
  - two right turn lanes (each of length 175 feet)
  - OR Construct the S. Bonnyview Road & Interstate 5 SB Ramps into a diverging diamond interchange

***Intersection 8- S. Bonnyview Road & Interstate 5 NB Ramps*:**
- Widen the eastbound approach to provide an additional eastbound left turn lane and
- Widen the northbound approach to provide:
  - ~~one left-turn pocket of length 285 feet~~
  - one shared thru/left turn of length ~~285~~ 300 feet
  - one right turn lane of length ~~285~~ 300 feet
  - OR Construct the S. Bonnyview Road & Interstate 5 NB Ramps into a diverging diamond interchange

YEAR 2020 PLUS PROJECT CONDITIONS MITIGATION

***Intersection 5- S. Bonnyview Road & Bechelli Lane*:**
- Widen the southbound approach to provide:
  - two left turn pockets of length 325 feet
  - one shared thru/left turn of length 325 feet
  - one right turn lane of length 325 feet
- OR Construct a multi-lane Roundabout

***Intersection 7- S. Bonnyview Road & Interstate 5 SB Ramps*:**
- Provide the same improvements recommended under Existing Plus Project conditions
- Extend southbound right turn lanes to 275 feet.
- OR Construct the S. Bonnyview Road & Interstate 5 SB Ramps into a diverging diamond interchange

***Intersection 8- S. Bonnyview Road & Interstate 5 NB Ramps*:**
- Provide improvements recommended under Existing Plus Project conditions
  - OR Construct the S. Bonnyview Road & Interstate 5 NB Ramps into a diverging diamond interchange

***Intersection 13- Churn Creek Road & Victor Avenue*:**
- Construct a southbound right turn pocket

***Intersection 14- Churn Creek Road & Rancho Road*:**
- Construct a southbound right turn pocket

***Roadway Segment 2- Churn Creek Road (from S. Bonnyview Road to Victor Avenue)*:**
- Construct improvements identified for intersections 11, 12, 13, and 14
  - OR Construct a TWLTL, from approximately the bridge over Churn Creek to intersections 13 & 14, however, eliminate left-turns at Huntington Drive, close gap in Huntington Drive, and construct a compact roundabout at Victor Avenue/El Verano Drive intersection.

YEAR 2040 PLUS PROJECT CONDITIONS MITIGATION

***Intersection 5- S. Bonnyview Road & Bechelli Lane (53%)*:**
- Provide improvements recommended under Year 2020 Plus Project conditions.
- Widen the eastbound approach to provide:
  - one left turn lane of length 400 feet
  - two thru lanes of length 400 feet
  - one shared thru/right lane of length 350 feet
- OR Construct multi-lane roundabout

***Intersection 7- S. Bonnyview Road & Interstate 5 SB Ramps (48%)*:**
- Provide improvements recommended under Existing Plus Project conditions, and Year 2020 Plus Project conditions
- Widen the westbound approach to provide two left turn lanes
- Extend southbound right turn lanes and thru/left pocket to 400 feet
- OR Construct the S. Bonnyview Road & Interstate 5 SB Ramps into a diverging diamond interchange

***Intersection 8- S. Bonnyview Road & Interstate 5 NB Ramps (22%)*:**
- Provide improvements recommended under Existing Plus Project conditions
- Add northbound left-turn lane, and
- Extend all northbound turn lanes to 500 feet
- OR Construct the S. Bonnyview Road & Interstate 5 NB Ramps into a diverging diamond interchange

***Intersection 11- Churn Creek Road & Hartmeyer Lane (13%)*:**
- Reconstruct intersection to achieve the following:
  - Eliminate westbound left turn movement
  - Provide a receiving lane on westbound Churn Creek Road for northbound left turns
  - Provide a northbound right turn lane
  - Widen the adjacent bridge to accommodate intersection improvements

***Intersection 12- Churn Creek Road & Huntington Drive (22%)*:**
- Reconstruct the intersection to provide:
  - A two-way-left-turn lane (TWLTL) along eastbound-westbound Churn Creek Road

***Intersection 13- Churn Creek Road & Victor Avenue (25%)*:**
- Construct the intersections of Churn Creek Road/Victor Lane and Churn Creek Road/Rancho Road into a 4 leg, single lane roundabout

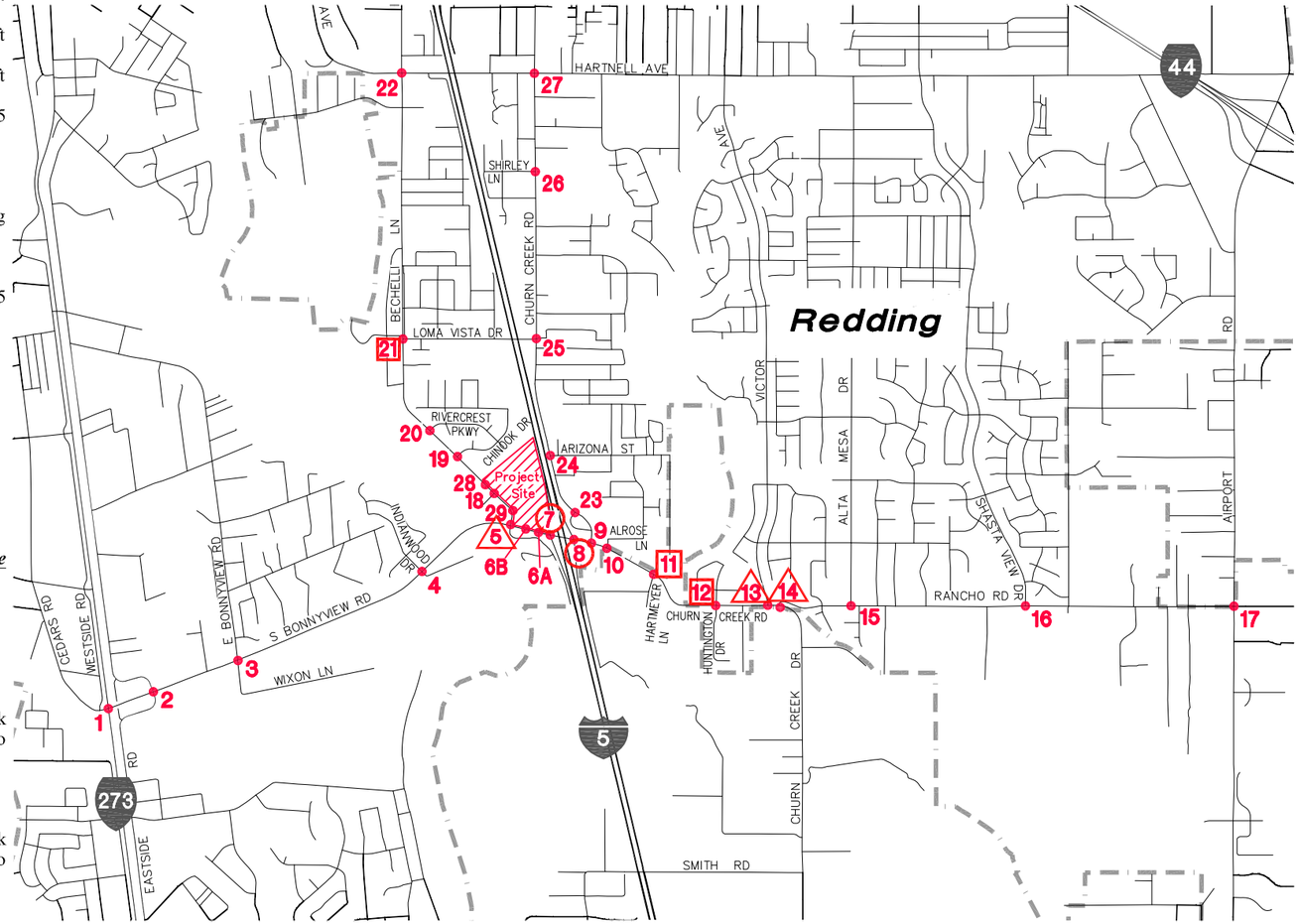
***Intersection 14- Churn Creek Road & Rancho Road (14%)*:**
- Construct the intersections of Churn Creek Road/Victor Lane and Churn Creek Road/Rancho Road into a 4 leg, single lane roundabout

***Intersection 21- Bechelli Lane & Loma Vista Drive (11%)*:**
- Construct a traffic signal with split phasing for the eastbound and westbound approaches, and protected left turn movements for northbound and southbound approaches, or
- OR Construct a 4-leg, single-lane roundabout

***Roadway Segment 1- S. Bonnyview Road (from SR273 to Churn Creek Road)*:**
- Construct the improvements identified for intersections 5, 7, and 8

***Roadway Segment 4- Bechelli Lane (from S, Bonnyview Road to Chinook Drive)*:**
- Construct a TWLTL

Legend:
- 00 – Existing Plus Project Mitigation
- 00 – Year 2020 Plus Project Mitigation
- 00 – Year 2040 Plus Project Mitigation
- * – Year 2040 Plus Project Mitigation is the same as Existing Plus Project
- City Limits



River Crossing Marketplace Specific Plan TIAR

Figure ES 1

Intersections and Roadways Requiring Improvements

Introduction

Costco Wholesale Corporation has retained Omni-Means to complete a Transportation Impact Analysis Report (TIAR) for the proposed River Crossing Marketplace Specific Plan in the City of Redding, CA. The subject property is located in the northwest quadrant of the Interstate 5/S. Bonnyview Road interchange in the City of Redding. The project includes the approximately 152,101 sq. ft. Costco Wholesale warehouse, ~~30 pump~~ 15-pump, 30 fueling position Costco fueling station, and 70,100 sq. ft. of general commercial retail. Figure 1 presents the project location and vicinity.

Consistent with the January 2009 City of Redding TIA Guidelines, the following traffic scenarios are analyzed in this TIAR:

- *Existing* Conditions
- *Existing Plus Project* Conditions
- *Year 2020 No Project* Conditions
- *Year 2020 Plus Project* Conditions
- *Year 2040 No Project* Conditions
- *Year 2040 Plus Project* Conditions

Existing conditions quantify the current traffic operations at the study locations.

The *Existing Plus Project* condition is an analysis scenario in which traffic impacts of the proposed project are investigated in comparison to the *Existing* conditions scenario. Within this scenario, the project generated peak hour traffic volumes have been added to the *Existing* conditions volumes to obtain the *Existing Plus Project* volumes.

Year 2020 No Project conditions refer to analysis scenarios that would exist in the projected occupancy year for the project.

Year 2020 Plus Project condition is the analysis scenario in which traffic impacts associated with the project are investigated in comparison to the *Year 2020 No Project* conditions.

The January 2009 City of Redding TIA Guidelines defines the following as Cumulative conditions:

Either:

Existing + Approved/Pending Project List, and

Existing + Approved/Pending Project List + Proposed Project

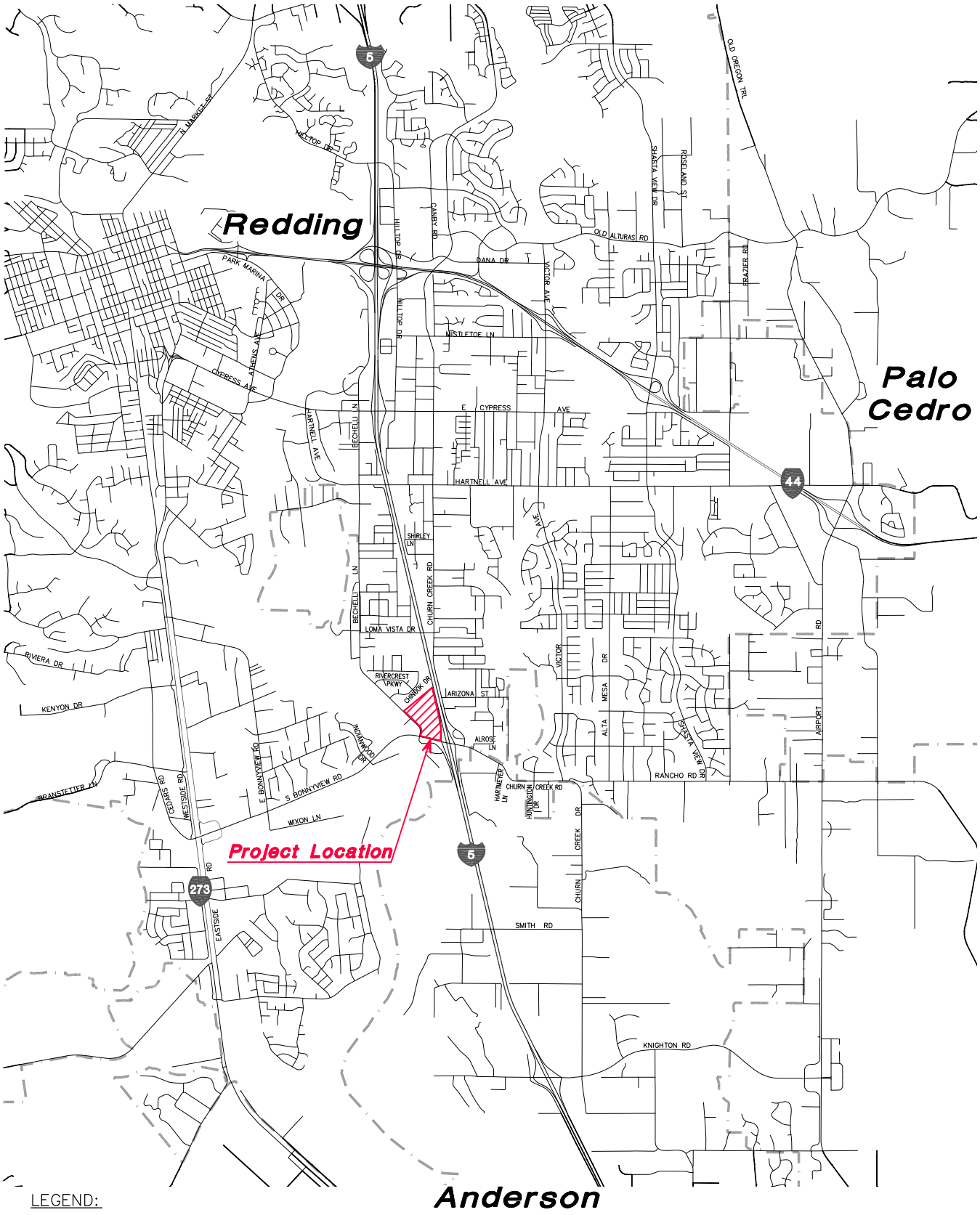
Or:

2040 Shasta County Travel Demand Model (SCTDM) without Proposed Project, and

2040 SCTDM + Proposed Project

Year 2040 No Project conditions refer to analysis scenarios that would exist following approximately 23 years of development in the City of Redding and Shasta County. *Year 2040 Plus Project* conditions refer to analysis scenarios in which traffic impact associated with the project are investigated in comparison to the *Year 2040 No Project* conditions.

The above traffic scenarios are described in further detail and evaluated in subsequent sections of this report.



LEGEND:

CITY LIMITS

River Crossing Marketplace Specific Plan TIAR Figure 1

Project Vicinity Map

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Project Setting

The following section provides an overview of the project setting, transportation system and study intersections. The City of Redding is the largest city in Shasta County, California, covering approximately 60 square miles. The US Census Bureau reports that in 2015, the population in Redding was approximately 91,600.

Transportation System

Roadways that provide primary circulation in the vicinity of the project site are as follows:

Interstate 5 (I-5) is an interstate freeway facility that traverses in the north-south direction through the State of California. In northern California, I-5 serves as the primary inter-regional auto and truck travel route that connects the northern counties with the Sacramento Valley. Within Shasta County, I-5 serves as a major commuter and truck route linking the Cities of Anderson, Redding, and Shasta Lake.

Churn Creek Road is a two to four-lane, north-south arterial that runs between Airport Road and College View Drive. Churn Creek Road runs in the east-west direction between South Bonnyview Road and Rancho Road, and a north-south direction between S. Bonnyview Road and Hartnell Avenue.

South Bonnyview Road is a four-lane, east-west arterial that runs between State Route 273 and Churn Creek Road.

Rancho Road is a two-lane, east-west arterial that runs between Churn Creek Road and Old Oregon Trail.

Bechelli Lane is a two to four-lane, north-south arterial that runs between south of South Bonnyview Road to its northern terminus, approximately one mile to the north of East Cypress Avenue.

Hartnell Avenue is a two to four-lane, east-west arterial that runs between East Cypress Avenue and Airport Road.

Study Intersections and Roadway Segments

The following section presents the study intersections analyzed in this TIAR.

Intersections

The following list of critical study intersections were selected in coordination with City of Redding staff for analysis within this study for weekday AM, weekday PM, and Saturday mid-day peak hour conditions:

1. S. Bonnyview Road/Cedar Road & State Route 273
2. S. Bonnyview Road & Eastside Road
3. S. Bonnyview Road & E. Bonnyview Road
4. S. Bonnyview Road & Indianwood Drive
5. S. Bonnyview Road & Bechelli Lane

6A. S. Bonnyview Road & Texaco Driveway

6B. S. Bonnyview Road & S. Bonnyview Driveway (*Plus Project* conditions only)

7. S. Bonnyview Road & Interstate 5 SB Ramps

8. S. Bonnyview Road & Interstate 5 NB Ramps
9. S. Bonnyview Road & Churn Creek Road
10. Churn Creek Road & Alrose Lane
11. Churn Creek Road & Hartmeyer Lane
12. Churn Creek Road & Huntington Drive
13. Churn Creek Road & Victor Avenue
14. Churn Creek Road & Rancho Road
15. Rancho Road & Alta Mesa Drive
16. Rancho Road & Shasta View Drive
17. Rancho Road & Airport Road
18. Bechelli Lane & Blue Shield Driveway/Middle Driveway (*Plus Project* conditions only)
19. Bechelli Lane & Chinook Drive
20. Bechelli Lane & Rivercrest Parkway
21. Bechelli Lane & Loma Vista Drive
22. Bechelli Lane & Hartnell Avenue
23. Churn Creek Road & Public ROW to Chevron
24. Churn Creek Road & Arizona Lane
25. Churn Creek Road & Loma Vista Drive
26. Churn Creek Road & Shirley Lane/Enterprise HS Driveway
27. Churn Creek Road & Hartnell Avenue
28. Bechelli Lane & Northern Driveway (*Plus Project* conditions only)
29. Bechelli Lane & Southern Driveway (*Plus Project* conditions only)

Roadway Segments

The following roadway/arterial segments will be subjected to arterial analysis:

1. S. Bonnyview Road, from State Route 273 to Churn Creek Road
2. Churn Creek Road, from S. Bonnyview Road to Victor Avenue
3. Rancho Road, from Churn Creek Road to Airport Road
4. Bechelli Lane, from S. Bonnyview Road to Chinook Drive (2-lane section)
5. Bechelli Lane, from Chinook Drive to 3rd Street (3-lane section)
6. Churn Creek Road, from S. Bonnyview Road to Hartnell Avenue
7. Churn Creek Road, from Rancho Road to Knighton Road

Freeway Mainline and Ramp Segments

The following Interstate 5 (I-5) mainline and ramp segments were selected for analysis in coordination with City of Redding and Caltrans staff for *Existing*, *Year 2020*, and *Year 2040* conditions, with and without the proposed project:

1. Cypress Avenue Off Ramp NB – Diverge
2. S. Bonnyview Road to Cypress Avenue NB – Mainline
3. S. Bonnyview Road On Ramp NB – Merge
4. S. Bonnyview Road Off Ramp NB – Diverge
5. Knighton Road to Bonnyview Road (6-lane section) NB – Mainline
6. Knighton Road to Bonnyview Road (4-lane section) NB – Mainline
7. Knighton Road On Ramp NB – Merge
8. Knighton Road Off Ramp SB – Diverge
9. S. Bonnyview to Knighton Road (4-lane section) SB – Mainline
10. S. Bonnyview to Knighton Road (6-lane section) NB – Mainline
11. S. Bonnyview Road On Ramp SB – Merge
12. S. Bonnyview Road Off Ramp SB – Diverge

13. Cypress Avenue to S. Bonnyview Road SB – Mainline
14. Cypress Avenue On Ramp SB – Merge

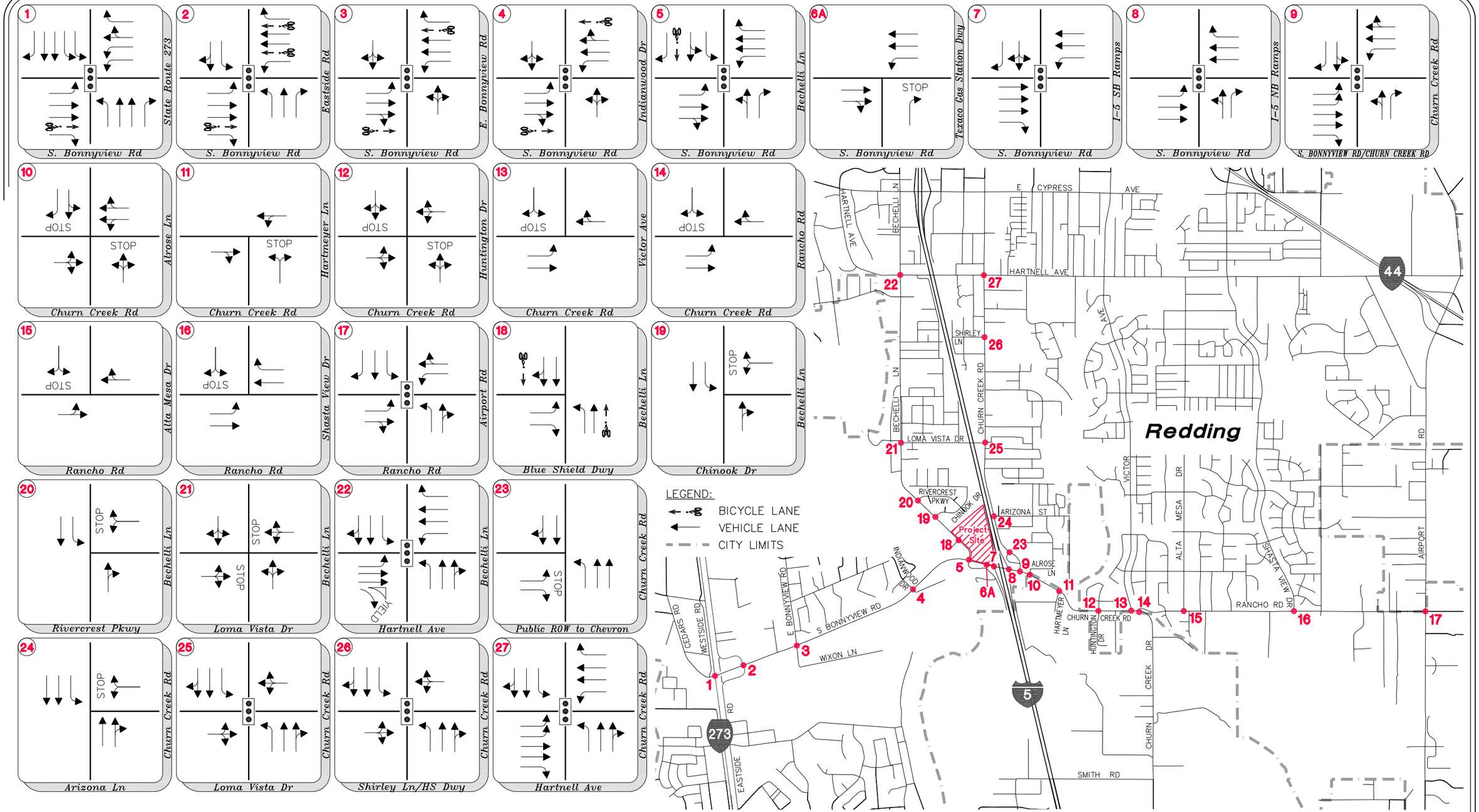
Figure 4 presents the ramp and freeway mainline traffic volumes, which were obtained from the 2015 published Caltrans data for the I-5 mainline and ramp merge/diverge operations. This data may be obtained from the following website: http://www.dot.ca.gov/trafficops/census/docs/2015_aadt_volumes.pdf.

Data Collection and Analysis

All intersections were analyzed during the weekday AM and PM peak hour period and Saturday mid-day peak hour period. The AM peak hour is defined as the highest continuous hour of peak traffic flow counted between 7:00 am and 9:00 am, and the PM peak hour is defined as the highest continuous hour of peak traffic flow counted between 4:00 pm and 6:00 pm under typical weekday conditions. The Saturday mid-day peak hour is defined as the highest continuous hour of peak traffic flow counted between 11:00 am and 1:00 pm.

Weekday AM and PM and Saturday mid-day peak hour intersection turn movement traffic counts were collected at all study intersections by Omni-Means on Tuesday September 13, 2016, Wednesday September 14, 2016, and Saturday September 10, 2016. Schools in the area were in regular session and no known special events were occurring in the area at the time of the traffic counts. Counts were obtained in the absence of inclement weather.

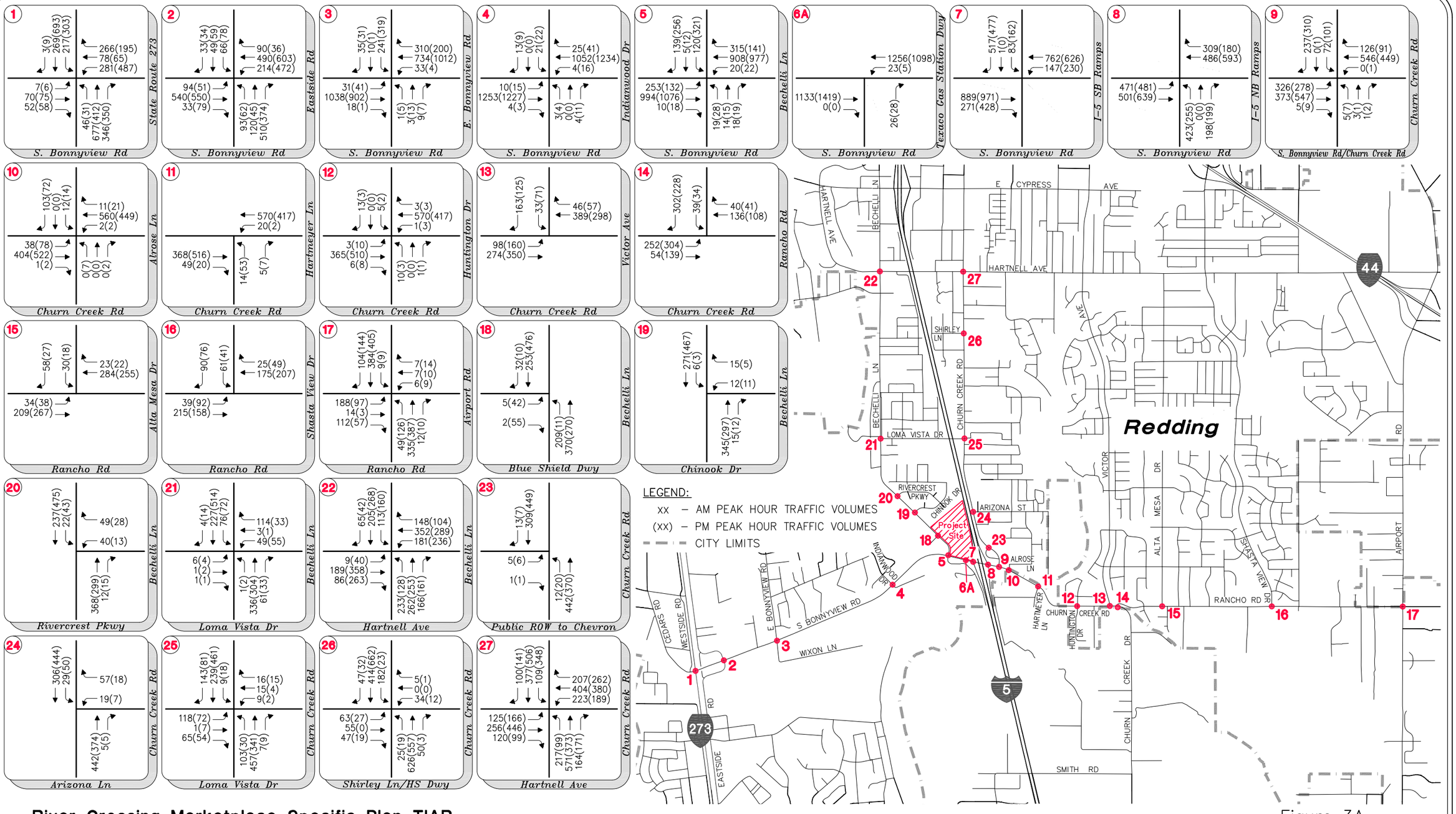
Figure 2 presents the existing intersection lane geometrics and traffic controls. Figure 3A presents the existing weekday AM and PM peak hour volumes. Figure 3B presents the existing Saturday mid-day peak hour volumes.



River Crossing Marketplace Specific Plan TIAR

Figure 2

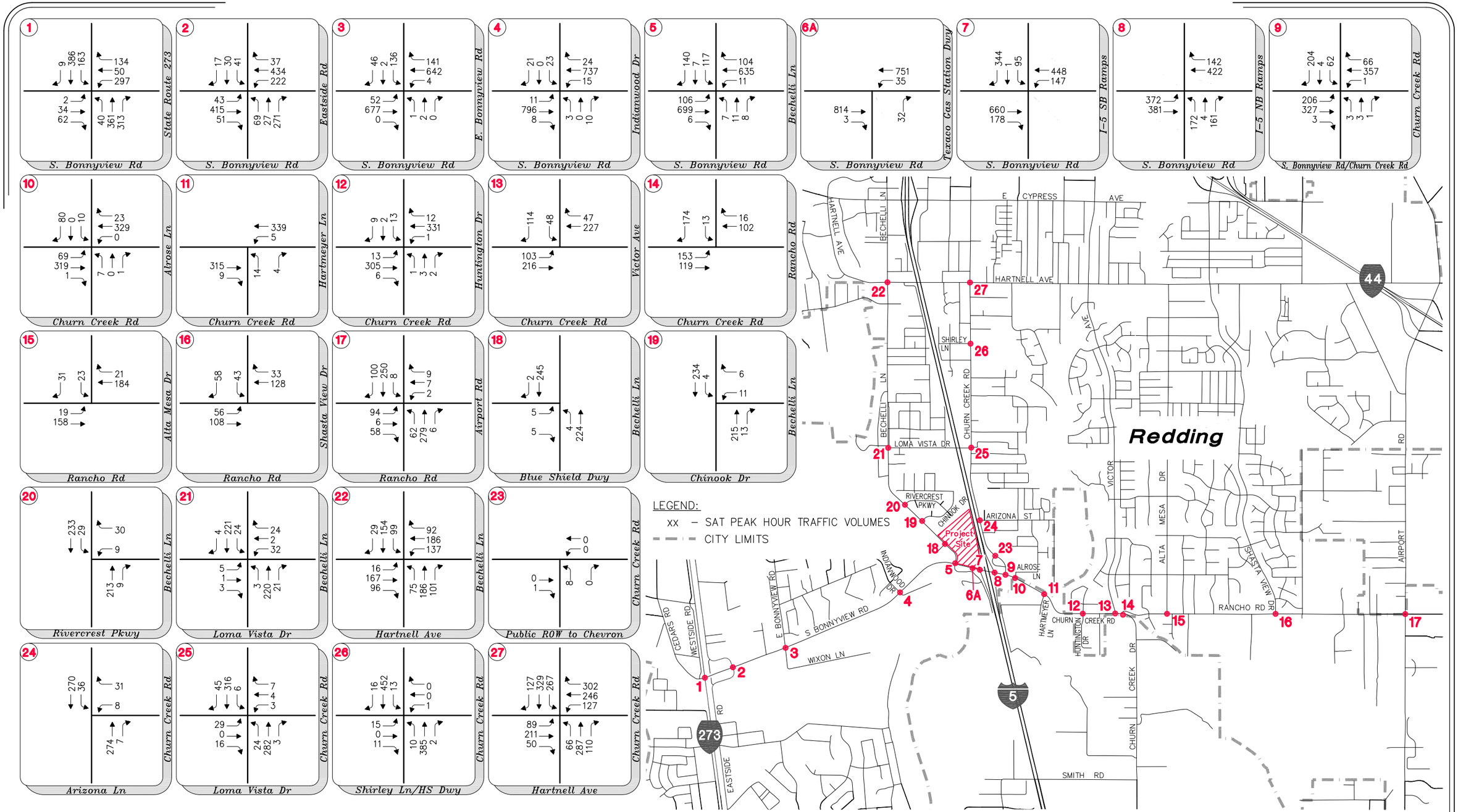
Existing Intersection Lane Geometrics and Control



River Crossing Marketplace Specific Plan TIAR

Figure 3A

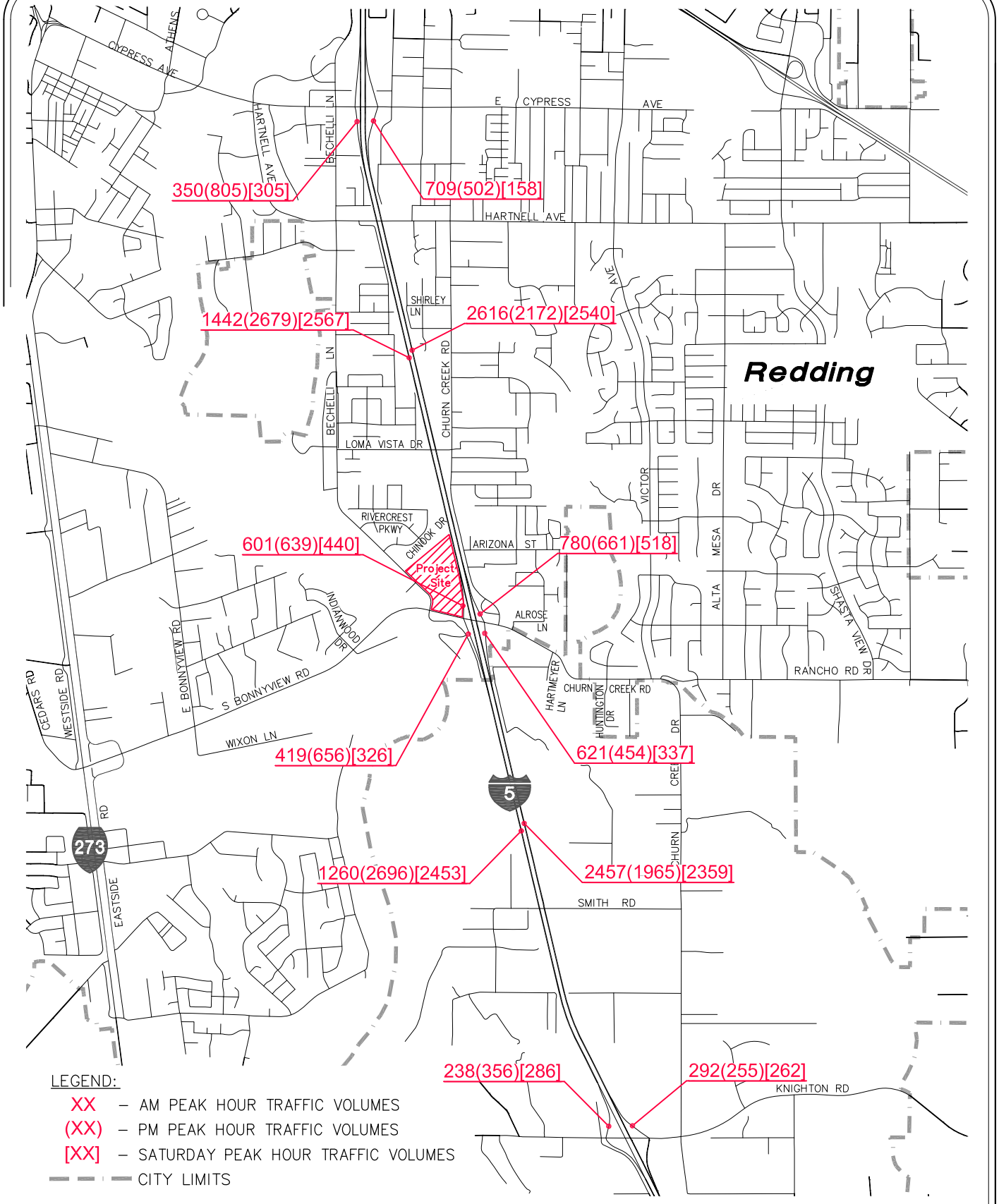
Existing Weekday AM and PM Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR

Figure 3B

Existing Saturday Mid-Day Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR Figure 4

Existing Ramp and Freeway Mainline Traffic Volumes

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Level of Service Methodologies and Guidelines

The following section presents a summary of the general level of service (LOS) methodologies and guidelines used in the analysis of intersections and freeway and roadway segments.

General LOS Methodologies

Intersection and ramp level of service (LOS) was calculated for all control types (e.g. signalization, stop sign controlled) using the methods documented in the Transportation Research Board publications *Highway Capacity Manual 2000 and 2010*. LOS determinations are presented on a letter grade scale from "A" to "F", whereby LOS "A" represents "free-flow" conditions and LOS "F" represents over capacity conditions.

Freeway Mainline and Ramp LOS Methodologies

Mainline and ramp LOS was calculated using *HCS 2010* software by McTrans. LOS was calculated on a density basis in passenger cars per mile per lane (pc/mi/ln). Table 1 presents the LOS thresholds for ramps in the study area.

TABLE 1
LEVEL OF SERVICE (LOS) CRITERIA FOR FREEWAY MAINLINE SEGMENTS AND RAMPS

BASIC FREEWAY SEGMENTS		RAMP MERGE AND DIVERGE AREAS	
LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
A	0 - 11	A	≤ 10
B	> 11 - 18	B	> 10 - 20
C	> 18 - 26	C	> 20 - 28
D	> 26 - 35	D	> 28 - 35
E	35 - 45	E	> 35
F	> 45	F	Demand exceeds capacity

References: 2010 Highway Capacity Manual

Intersection LOS Methodologies

Level of Service (LOS) was calculated for all intersection control types using the methods documented in the Transportation Research Board's *Highway Capacity Manual 2000 and 2010*. Level of service is a qualitative measure of traffic operating conditions, whereby a letter grade A through F is assigned to an intersection or roadway segment representing progressively worsening traffic conditions.

For signalized intersections, intersection delays and LOS are average values for all intersection movements. For two-way stop-controlled (TWSC) intersections, the intersection delays and LOS are represented by the worst approach. Table 2 presents the delay-based LOS criteria for different types of intersection control.

TABLE 2
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle (sec) Signalized/ Roundabouts	Stopped Delay/Vehicle (sec) Unsignalized/ All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	< 10.0	< 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and < 20.0	>10.0 and < 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20.0 and < 35.0	>15.0 and < 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and < 55.0	>25.0 and < 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and < 80.0	>35.0 and < 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0

References: 2010 Highway Capacity Manual

Arterial LOS Methodologies

Level of Service was calculated for the seven (7) roadway/arterial segments by using the methods documented in Section 4.5.E of the City of Redding Traffic Impact Analysis (TIA) Guidelines. As outlined within this Section, the following two methods may be used to obtain roadway level of service:

Method 1 is based on the average travel speed and the methods presented in Chapter 15 of HCM (2010). This method is not intended for application to a short roadway segment. While this method determines the directional LOS for each individual segment along a roadway, only the over-all directional LOS shall be used for identifying project impacts. The results for individual segments along the overall roadway shall be provided for information only.

Method 2 uses the peak hour service volumes presented in Table 3.

TABLE 3
MAXIMUM PEAK HOUR VOLUME PER LANE

	Maximum Peak Hour Volume Per Lane					
		LOS				
#	Roadway Type	A	B	C	D	E
1	Expressway - High Access Control	570	660	760	850	950
2	Expressway - Moderate Access Control	520	610	700	790	870
3	Divided Arterial (w/LTL)	500	560	650	730	810
4	Undivided Arterial (no LTL)	410	470	540	610	680
5	Collector	270	340	410	470	540

Notes
1. Based on HCM 2000 Chapter 10.

For all scenarios, Method 1 was used to obtain the arterial LOS for the S. Bonnyview Corridor between State Route 273 and Churn Creek Road. As this segment of S Bonnyview Road spans approximately 2 miles and nine (9) intersections, this corridor would not be classified as a short roadway segment. For each scenario, the overall directional average travel speed and LOS is reported for the direction in which the minimum is recorded.

For all scenarios, Method 2 was used to obtain the arterial LOS of all roadway segments except for S. Bonnyview Corridor between SR 273 and Churn Creek Road. For each roadway segment, the existing geometric configuration was used to determine the roadway type. The maximum directional peak hour volume per lane was used to determine the roadway LOS.

Agency LOS Guidelines and Policies

City of Redding LOS Guidelines

The City of Redding's General Plan Transportation Element contains the following policy pertaining to LOS standards in the City:

> *Policy T1A: Establish the following peak-hour LOS standards for transportation planning and project review. They reflect the special circumstances of various areas of the community:*
>
> - *Use LOS "C" – for most arterial streets and their intersections.*
> - *Use LOS "D" – for the Downtown area where vitality, activity, and pedestrian and transit use are primary goals.*

- *Use LOS "D" – for streets within the State highway system and interchanges.*
- *Use LOS "D" – for river-crossing street corridors whose capacity is affected by adjacent intersections.*

The City of Redding General Plan Transportation Element is accessible via the following internet site: *http://www.cityofredding.org/home/showdocument?id=5513.*

Shasta County LOS Guidelines

Shasta County's General Plan Circulation Element contains the following policy pertaining to LOS standards in the County:

> *C-6l New development which may result in exceeding LOS E on existing facilities shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated. Such mitigation may take the form of, but not limited to the following:*
>
> - *Provision of capacity improvements to the specific road link to be impacted, the transit system, or any reasonable combination;*
> - *Provision of demand reduction measures included as part of the project design or project operation or any feasible combination.*

Caltrans LOS Guidelines

The Caltrans published Guide for the Preparation of Traffic Impact Studies (dated December 2002) states the following:

> *"Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS."*

Consistent with the agencies' policies, this study will consider LOS "C" and LOS "D" as the standard acceptable threshold for all intersections in the jurisdiction of the City of Redding, LOS "E" as the standard acceptable threshold for all intersections in the jurisdiction of Shasta County, and LOS "D" as the standard acceptable threshold for all intersections in the jurisdiction of Caltrans. Table 4 presents the intersection, jurisdiction, and LOS threshold for each of the study intersections.

TABLE 4
INTERSECTION LEVEL OF SERVICE THRESHOLD AND JURISDICTION

#	Intersection	Jurisdiction	Target LOS
1	S Bonnyview Rd/ Cedars Rd & SR 273	Caltrans	D
2	S Bonnyview Rd/ Eastside Rd	City of Redding	D
3	S Bonnyview Rd/ E Bonnyview Rd	City of Redding	D
4	S Bonnyview Rd/ Indianwood Dr	City of Redding	D
5	S Bonnyview Rd/ Bechelli Ln	City of Redding	D
6	S Bonnyview Rd/ Texaco Dwy	City of Redding	D
7	S Bonnyview Rd/ I-5 SB Ramps	Caltrans	D
8	S Bonnyview Rd/ I-5 NB Ramps	Caltrans	D
9	S Bonnyview Rd/ Churn Creek Rd	City of Redding	D
10	Churn Creek Rd/ Alrose Ln	City of Redding	D
11	Churn Creek Rd/ Hartmeyer Ln	Shasta County	E
12	Churn Creek Rd/ Huntington Dr	City of Redding	D
13	Churn Creek Rd/ Victor Ave	City of Redding	D
14	Churn Creek Rd/ Rancho Rd	City of Redding	C
15	Rancho Rd/ Alta Mesa Dr	City of Redding	C
16	Rancho Rd/ Shasta View Dr	City of Redding	C
17	Rancho Rd/ Airport Rd	City of Redding	C
18	Bechelli Ln/ Blue Shield Dwy	City of Redding	C
19	Bechelli Ln/ Chinook Dr	City of Redding	C
20	Bechelli Ln/ Rivercrest Pkwy	City of Redding	C
21	Bechelli Ln/ Loma Vista Dr	City of Redding	C
22	Bechelli Ln/ Hartnell Ave	City of Redding	C
23	Churn Creek Rd/ Public ROW to Chevron	City of Redding	C
24	Churn Creek Rd/ Arizona Ln	City of Redding	C
25	Churn Creek Rd/ Loma Vista Dr	City of Redding	C
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	City of Redding	C
27	Churn Creek Rd/ Hartnell Ave	City of Redding	C

Significance Threshold

In accordance with the January 2009 City of Redding TIA Guidelines, the following thresholds of significance are used to determine if the proposed project causes a significant impact and requires mitigation:

Signalized Intersections

- The project causes an acceptable LOS to decline to an unacceptable LOS, or
- The project increases the overall average delay by more than 5 seconds per vehicle at an intersection having an unacceptable LOS without project traffic.

Two-Way Stop Intersections

- The project causes the following to occur for the worst-case movement:
  - The LOS declines to an unacceptable LOS, and
  - The volume to capacity ratio exceeds 0.75, and
  - The 95th percentile queue exceeds 75 feet (3 vehicles), or
- The project causes the worst-case movement's acceptable LOS to decline to an unacceptable LOS and the peak hour volume signal warrant is met, or
- The project increases the average delay for the worst-case movement by more than 5 seconds per vehicle at an intersection that has an unacceptable LOS without the project and the intersection also meets the peak hour volume signal warrant.

Roadways

City of Redding TIA Guidelines do not have specified significance thresholds for Roadway Segment. Therefore, consistent with past reports and industry standards, the following thresholds have been established. The project is considered to have a significant impact if it would:

- Result in a roadway that will operate at an acceptable LOS in the No Project condition to deteriorate to an unacceptable LOS in the Plus Project condition; or,
- Increase in the V/C ratio by more than 5% at a roadway that will operate at an unacceptable LOS in the No Project condition; or,
- Decrease in the average arterial speed by more than 5% at a roadway that will operate at an unacceptable LOS in the No Project condition.

Freeway Mainline/Ramp Merge-Diverge/Weave

Caltrans TIA Guidelines do not have specified significance thresholds for Roadway Segment, therefore, consistent with past reports and industry standards the following thresholds have been established. The project is considered to have a significant impact if it would:

- Result in a facility that will operate at an acceptable LOS in the No Project condition to deteriorate to an unacceptable LOS in the Plus Project condition; or,
- Increase the density by more than 5% at a facility that will operate at an unacceptable LOS in the No Project condition.

Mitigations and Fees

In accordance with the January 2009 City of Redding TIA Guidelines, the following guidelines apply if the proposed project causes a significant impact and requires a payment into the Traffic Impact Fee program:

6.1 Impacts in Existing Plus Project Conditions *- It is the project's responsibility to install the project's recommended improvements at the time of development in order to mitigate impacts to a less-than-significant level. The project is 100% responsible for these improvements.*

6.2 Impacts in Cumulative Conditions

A. *If the project's fair share of a cumulative impact is 25 percent or more, then the recommended improvements shall be installed at the time of development, subject to a reimbursement agreement. If the recommended improvement is included in the current list of Traffic Impact Fee (TIF) projects, reimbursement will be in the form of either TIF credit or payment from the TIF.*

B. *If the project's fair share of a cumulative impact is less than 25 percent, then the project will be required to pay its fair share of the cost of the improvements to be*

constructed later by others, prior to the realization of the impact. If the recommended improvement is included in the current list of TIF projects, then payment of the project's TIF fee will be considered mitigation for the impact.

The Guidelines are intended to establish basic parameters for the development of traffic impact analysis reports and to provide general guidance on mitigating project impacts for typical projects. As such, they serve as a tool for City staff to utilize in its review and approval of development projects. By their very nature, the guidelines are not intended to establish project mitigation parameters, or eliminate City discretion to determine whether a mitigation measure recommended by the guidelines based on a project's fair share of impacts is appropriate or feasible given the specific circumstances of a given project.

Technical Analysis Parameters

This TIAR provides a "preliminary operational level" evaluation of traffic operating conditions. Table 5 presents the technical analysis parameters that were used in this study.

TABLE 5
INTERSECTION TECHNICAL ANALYSIS PARAMETERS

1	Analysis Period - 15 Minutes
2	Peak Hour Factor (PHF)- from counts for Existing conditions, 0.92 or higher for Year 2040 conditions. PHF Greater than 0.92 due to Existing counts showing higher PHF.
3	% Trucks: weekday peak hour analysis - from counts
4	25 ft. assumed vehicle length for stacking and queues
5	Cycle Length - 80 sec min, 150 sec max (optimize signal timing)
6	Coordinated Cycle Length - obtained from City and Caltrans (optimize signal timing for Year 2040 conditions)
7	Total Lost Time Per Signal Phase - 4 seconds (24 sec max for 8-phase signal)
8	Pedestrian Speed - 3.5 ft/s and 10 mph for bicycles

Source: Figure 4.5 City of Redding TIA Guideline January 2009, modified as appropriate.

Warrant Analysis

A supplemental traffic signal "warrant" analysis was completed for unsignalized intersections determined to be operating at an unacceptable LOS. The term "signal warrant" refers to the list of established criteria used by public agencies to quantitatively justify or ascertain the need for installation of a traffic signal at an unsignalized intersection. This study has employed the signal warrant criteria presented in the latest edition of the California Manual on Uniform Traffic Control Devices (MUTCD) for all unsignalized study intersection.

The California MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. Specifically, this study utilizes the peak hour volume-based Warrant 3 as one representative type of traffic signal warrant analysis. It should be noted that the Peak Hour Volume Warrant was only applied when the intersection was found to be operating at an unacceptable LOS. Therefore, there may be instances when the unsignalized intersection operates at acceptable LOS conditions but still meets the Peak Hour Volume Warrant.

Existing Conditions

The *Existing* condition is the analysis scenario in which current operations at study locations are analyzed and establishes the baseline traffic conditions.

Intersection Operations

Existing weekday AM and PM peak hour intersection traffic operations were quantified utilizing the existing traffic volumes and existing intersection lane geometrics and control. Table 6 presents intersection operations for the *Existing* conditions.

TABLE 6
EXISTING INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	32.7	C	-	31.6	C	-	26.8	C	-
2	S Bonnyview Rd/ Eastside Rd	Signal	D	30.3	C	-	35.3	D	-	21.5	C	-
3	S Bonnyview Rd/ E Bonnyview Rd	Signal	D	25.4	C	-	29.0	C	-	13.3	B	-
4	S Bonnyview Rd/ Indianwood Dr	Signal	D	4.6	A	-	7.8	A	-	5.1	A	-
5	S Bonnyview Rd/ Bechelli Ln	Signal	D	17.8	B	-	21.2	C	-	14.3	B	-
6A	S Bonnyview Rd/ Texaco Dwy	TWSC	D	17.7	C	-	16.5	C	-	11.5	B	-
7	S Bonnyview Rd/ I-5 SB Ramps	Signal	D	24.5	C	-	18.6	B	-	14.6	B	-
8	S Bonnyview Rd/ I-5 NB Ramps	Signal	D	43.3	D	-	27.5	C	-	26.1	C	-
9	S Bonnyview Rd/ Churn Creek Rd	Signal	D	20.5	C	-	22.5	C	-	21.0	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	12.0	B	-	15.7	C	-	12.9	B	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	19.5	C	-	21.3	C	-	13.4	B	-
12	Churn Creek Rd/ Huntington Dr	TWSC	D	23.8	C	-	19.5	C	-	14.3	B	-
13	Churn Creek Rd/ Victor Ave	TWSC	D	18.2	C	-	29.2	D	-	14.9	B	-
14	Churn Creek Rd/ Rancho Rd	TWSC	C	15.6	C	-	16.2	C	-	10.6	B	-
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	13.0	B	-	11.7	B	-	10.5	B	-
16	Rancho Rd/ Shasta View Dr	TWSC	C	15.7	C	-	12.0	B	-	10.6	B	-
17	Rancho Rd/ Airport Rd	Signal	C	18.9	B	-	21.4	C	-	12.8	B	-
18	Bechelli Ln/ Blue Shield Dwy	Signal	C	6.9	A	-	5.8	A	-	2.6	A	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	12.0	B	-	13.1	B	-	10.6	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	13.8	B	-	12.4	B	-	10.2	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**31.2**	**D**	**No**	**35.6**	**E**	**No**	12.6	B	-
22	Bechelli Ln/ Hartnell Ave	Signal	C	32.8	C	-	30.7	C	-	21.3	C	-
23	Churn Creek Rd/ Public ROW to Chevron	TWSC	C	13.0	B	-	14.6	B	-	11.3	B	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	11.6	B	-	10.8	B	-	9.9	A	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	16.2	B	-	12.6	B	-	13.4	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	31.4	C	-	12.8	B	-	7.2	A	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**39.6**	**D**	**-**	**42.3**	**D**	**-**	28.5	C	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*

As shown in Table 6, all study intersections, except the intersections listed below, are currently found to operate at or above the threshold LOS:

- Intersection 21 - Bechelli Lane & Loma Vista Drive
- Intersection 27 - Churn Creek Road & Hartnell Avenue

Roadway Segment Operations

Table 7 presents a summary of the *Existing* roadway segment operations.

TABLE 7
EXISTING NO PROJECT ROADWAY OPERATIONS

#	Roadway Segment	Roadway Type[1]	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	22.2	C	21.3	D	26.4	C
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	492	C	504	C	309	A
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	280	A	277	A	189	A
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	C	439	B	346	A	226	A
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	411	A	509	B	245	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Dvided Arterial	C	302	A	277	A	177	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	176	A	173	A	132	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

4. ***Bold*** *= Unacceptable Conditions*

As presented in Table 7, all study roadway segments are projected to operate at or above the target LOS.

Existing Queues

Queuing data is used to determine if the storage capacity is adequate at each intersection. Tables 8A and 8B present a summary of the *Existing* queues obtained for the S. Bonnyview Road and Bechelli Lane corridors.

TABLE 8A
EXISTING 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Existing No Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***					
	Eastbound Left	Signal	***249***	145	126	200
	Eastbound Thru		269	237	124	
	Eastbound Thru/Right		147	184	68	
	Westbound Left/U-Turn		50	50	31	140
	Westbound Thru		187	212	119	
	Westbound Right		107	62	40	
	Northbound Thru/Left		62	79	48	
	Northbound Right		***45***	***52***	***36***	30
	Southbound Left		109	203	104	
	Southbound Left/Thru		77	201	79	
	Southbound Right		90	***160***	75	110
7	***S Bonnyview Rd & I-5 SB Ramps***					
	Eastbound Thru	Signal	***316***	207	125	250
	Eastbound Right		105	169	58	250
	Westbound Left		173	214	156	
	Westbound Thru		106	105	61	
	Southbound Left/Thru		117	164	110	175
	Southbound Right		331	264	126	
8	***S Bonnyview Rd & I-5 NB Ramps***					
	Eastbound Left	Signal	496	442	347	
	Eastbound Thru		488	330	201	
	Westbound Thru		188	236	137	
	Westbound Right		***134***	97	52	110
	Northbound Thru/Left		386	216	174	
	Northbound Right		205	98	73	285
9	***S Bonnyview Rd & Churn Creek***					
	Eastbound Left	Signal	***196***	***196***	***137***	130
	Eastbound Thru		155	194	86	
	Eastbound Right		7	28	3	115
	Westbound Left		-	9	8	75
	Westbound Thru		135	131	78	
	Westbound Thru/Right		213	164	82	
	Northbound Left/Thru		28	29	25	
	Northbound Right		11	14	10	
	Southbound Thru/Left		119	169	96	
	Southbound Right		103	142	87	

TABLE 8B
EXISTING 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Existing No Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***					
	Eastbound Left/Thru/Right	Signal	147	296	100	
	Westbound Left/Thru		4	5	-	
	Westbound Thru/Right		10	5	3	
	Northbound Left/Thru/Right		-	31	26	
	Southbound Left		29	36	30	
	Southbound Right		64	60	58	
22	***Bechelli Ln & Hartnell Ave***					
	Eastbound Left	Signal	24	70	32	140
	Eastbound Thru		99	187	82	
	Eastbound Right		14	70	25	140
	Westbound Left		***222***	***356***	145	150
	Westbound Thru		148	134	76	
	Westbound Right		23	41	36	155
	Northbound Left		***334***	***167***	***93***	50
	Northbound Thru		167	166	89	
	Southbound Left		***143***	***206***	***113***	50
	Southbound Thru		123	155	68	
25	***Churn Creek Rd & Loma Vista Dr***					
	Eastbound Left/Thru/Right	Signal	152	88	-	
	Westbound Left/Thru/Right		48	26	22	
	Northbound Left		***117***	44	37	60
	Northbound Thru		161	117	93	
	Southbound Left		22	31	15	75
	Southbound Thru		117	184	118	
27	***Churn Creek Rd & Hartnell Ave***					
	Eastbound Left	Signal	93	113	65	110
	Eastbound Thru		146	246	110	
	Eastbound Right		58	52	5	75
	Westbound Left		***288***	***243***	***168***	75
	Westbound Thru		184	182	112	
	Westbound Right		59	61	63	205
	Northbound Left		***420***	***150***	102	115
	Northbound Thru		508	294	196	
	Southbound Left		***161***	***581***	***368***	110
	Southbound Thru		260	335	196	

Note: ***Bold*** text indicates queues that exceed available storage

Freeway and Ramp Operations

Table 9 presents a summary of the Existing ramp merge, diverge and freeway mainline operations.

TABLE 9
EXISTING NO PROJECT RAMP AND FREEWAY OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	709	20.2	B	502	17.0	B	158	18.6	C
2	Bonnyview Rd to Cypress Ave NB	D	Mainline	3	2,616	15.5	B	2,172	12.8	B	2,540	15.0	B
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	780	18.3	B	661	15.1	B	518	16.7	B
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	621	17.4	B	454	13.9	B	337	16.0	B
5	Knighton Rd to Bonnyview Rd NB	D	Mainline	3	2,457	14.5	B	1,965	11.6	B	2,359	13.9	B
6	Knighton Rd to Bonnyview Rd NB	D	Mainline	2	2,457	21.8	C	1,965	17.4	B	2,359	20.9	C
7	Knighton Rd On Ramp NB	D	Merge	1	292	24.6	C	255	20.1	C	262	23.6	C
8	Knighton Rd Off Ramp SB	D	Diverge	1	238	13.0	B	356	27.2	C	286	24.8	C
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	1,260	11.2	B	2,696	24.0	C	2,453	21.7	C
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	1,260	7.4	A	2,696	15.9	B	2,453	14.5	B
11	S. Bonnyview Rd On Ramp SB	D	Merge	1	419	11.4	B	656	19.2	B	326	17.0	B
12	S. Bonnyview Rd Off Ramp SB	D	Diverge	1	601	11.3	B	639	18.9	B	440	17.8	B
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	1,442	8.5	A	2,679	15.8	B	2,567	15.2	B
14	Cypress Ave On Ramp SB	D	Merge	1	350	11.0	B	805	18.5	C	305	16.8	B

Notes:
Capacity of Upstream/Downstream Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

As presented in Table 9, all study ramps and freeway segments are currently found to operate at acceptable LOS.

Project Description

For analysis purposes, the proposed project will be completed in a single phase. The term "project", as used in this report, refers to the development as follows:

- Location: ± 25.16 acres east of Bechelli Lane, north of S. Bonnyview Road, west of, and south of Rivercrest Estates subdivision.
    - Land Use Quantities:
        - ± 152,101 sq. ft. Costco
        - ± 70,100 sq. ft. General Commercial Retail
        - 30 fueling positions
- Access to the project will be via three (3) proposed driveways along Bechelli Lane and one (1) proposed driveway along S. Bonnyview Road.
    - One Full-Access unsignalized driveway on Bechelli Lane (northern driveway).
    - One Full-Access signalized driveway on Bechelli Lane at existing Blue Shield Driveway (middle driveway).
    - One unsignalized driveway with ~~Right-In/Right-Out (RIRO) Access~~ <u>three quarter access (right-in, right-out, and left-out)</u> on Bechelli Lane (southern driveway). <u>(Superseded by the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum.)</u>
    - One unsignalized driveway with RIRO Access on S. Bonnyview Road (S. Bonnyview driveway).

The full build-out of the proposed project will generate approximately 568 weekday AM and 616 weekday PM and 1,001 Saturday (mid-day) peak hour trips.

Project Site Access

Access to the project will be via three (3) proposed driveways along Bechelli Lane (two full and one ¾ access driveways) and one (1) proposed driveway along S. Bonnyview Road (Right-In/Right-Out driveway).

~~The projected queueing on Bechelli Lane during the PM peak hour will prohibit a left-out movement at the intersection of Bechelli Lane & Southern Driveway. As such, within this analysis, this intersection was analyzed with the following lane geometrics:~~

- ~~Right-In/Right-Out with the intersection of Bechelli Lane & Blue Shield Driveway/Middle Driveway being modified to allow northbound U-turns.~~

~~The signal at Middle Driveway/Blue Shield Driveway would allow U-turn movements (at northbound Bechelli Lane) so vehicles exiting Southern Driveway can still access Bonnyview Road by performing the following turning movements:~~

- ~~Exit Southern Driveway and enter northbound Bechelli Lane by performing a westbound right-turn movement~~
- ~~Perform a U-turn at the intersection at Bechelli Lane & Blue Shield Driveway/ Middle Driveway.~~
- ~~Travel southbound Bechelli Lane and enter westbound/eastbound S. Bonnyview Road by performing a southbound left/right-turn, respectively.~~

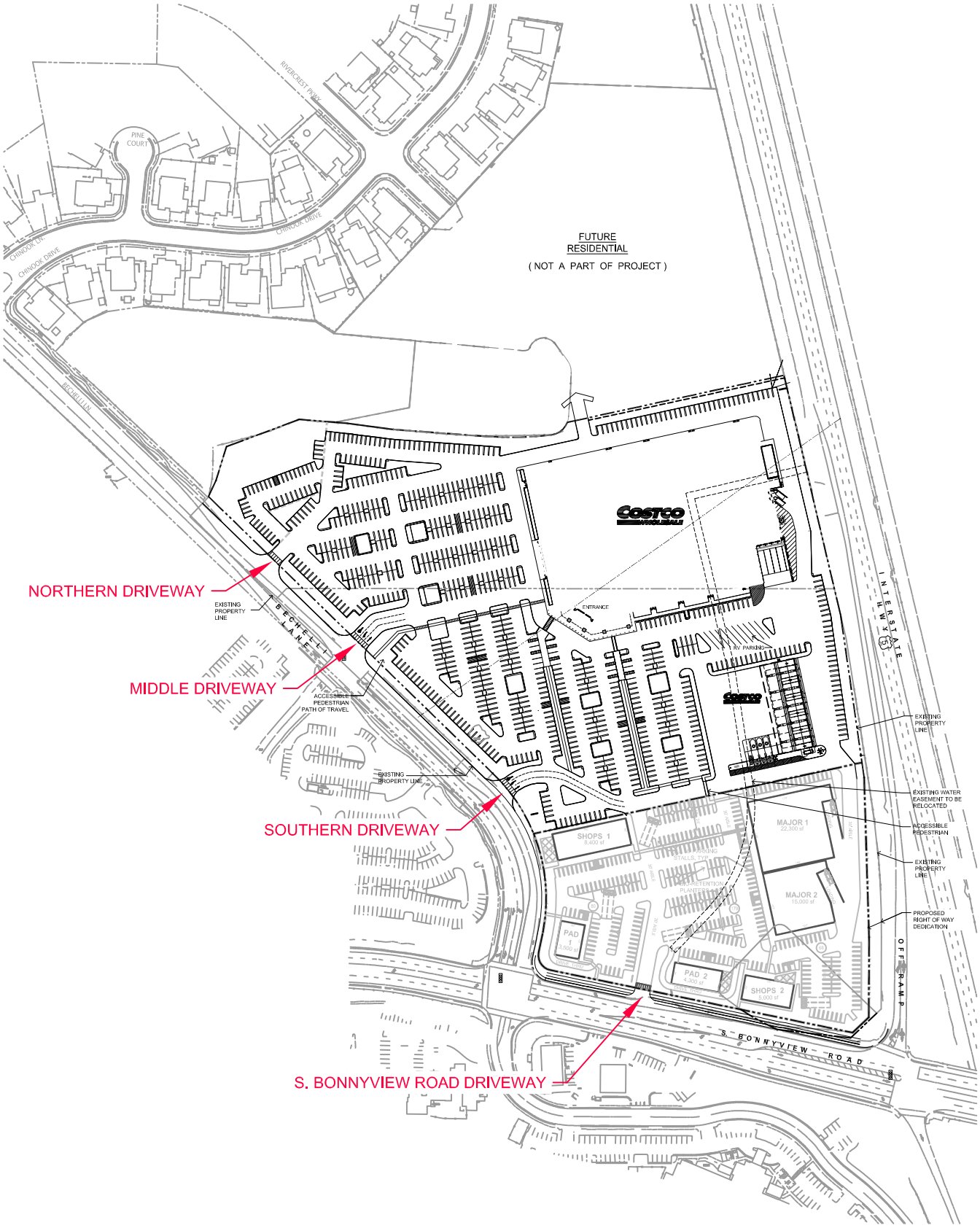
~~This would require the intersection of Blue Shield Driveway/Middle Driveway be reconstructed in order to accommodate U-turns.~~

Further details on the ¾ access driveway are included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Additionally, the proposed project is to construct an additional northbound thru lane on Bechelli Lane between S. Bonnyview Road and the Middle Driveway.

The on-site truck route has the trucks enter the Northern Driveway, travel around the Costco and park in the loading dock. To exit, the trucks use the Southern Driveway.

Figure 5 presents the project site plan and the project access locations.



River Crossing Marketplace Specific Plan TIAR Figure 5

Project Site Plan

Project Trip Generation

As the proposed project contains fast food restaurants and a retail center in addition to the Costco warehouse and the fuel station, this project would be considered as a multi-use development.

In order to calculate trip generation for the proposed Costco and Costco gas station, the trip generation memorandum, *Redding Costco/Trip Information*, prepared by Kittelson & Associates, Inc. dated September 13, 2016 (Appendix E) was consulted. The trip generation memo provides trip generation estimates for weekday AM and PM and Saturday mid-day peak hours for Costco locations throughout the Western Region of the US. The memo also provides rates for the generation of gas station trips. In addition to trip rates, customer survey information was included in the memorandum that provided the percentage of primary, pass-by and diverted link trips.

When compared to other land uses with similar building sizes, Costco Warehouses typically generate higher traffic volumes. In addition, Costco Warehouses were shown to generate more traffic compared to the published average rates and equations in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual 9th Edition*. Table 10 presents the trip generation that was calculated using the rates provided in the memorandum.

Commercial Retail Trip Generation Methodology

The proposed project would contain 63,300 square feet of commercial retail uses. Trip rates for the daily and peak hours are computed using fitted curve equations from ITE *Trip Generation Manual 9th Edition*. The rates thus derived were applied for the 63,300 square feet retail uses. This methodology was utilized to capture the interactions between the Costco and other retail uses. Pass-by trips were calculated using the average pass-by trip percentage presented within the *ITE Trip Generation Manual, 9th Edition* for Shopping Center (820).

Fast Food Restaurant Trip Generation Methodology

The proposed project would contain 6,800 square feet of fast food restaurant. An average daily trip rate of 496.12 trips/KSF was used from the ITE Trip Generation Manual 9th Edition, using Land Use Code 934 (Fast Food with Drive Thru Window). For the peak hour trip generation, average rates for Fast Food with Drive Thru Window (934) were used when available to determine the baseline rate. Pass-by trips were calculated using the average pass-by trip percentage presented within the ITE Trip Generation Manual, 9th Edition for Fast Food with Drive Thru Window (934).

Internal Trip Capture Methodology

Internal trips are anticipated between the fast food restaurant, shopping center, Costco warehouse, and fuel station.

Table 10 presents the resulting trip generation estimates that were calculated using the rates provided in the Kittelson memorandum and the ITE Trip Generation Manual 9th Edition as discussed above. Table 10 also presents the internally captured trips within the project site, for the weekday AM and PM and Saturday mid-day peak hour periods. Pass-by trips for the weekday AM and PM and Saturday mid-day peak hour periods are also presented within Table 10.

TABLE 10
PROPOSED PROJECT TRIP GENERATION

Land Use Category (ITE Code)	Unit[1]	Daily Trip Rate/Unit[2]	AM Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit			Saturday Peak Hour Trip Rate/Unit		
			Total	In %	Out %	Total	In %	Out %	Total	In %	Out %
Discount Club (857)	KSF	79.27	0.49	70%	30%	7.17	49%	51%	9.79	51%	49%
Gasoline/Service Station (944)	Pumps	-	14.96	51%	49%	-	-	-	-	-	-
Shopping Center (820)	KSF	51.95	1.16	62%	38%	4.65	48%	52%	6.69	48%	52%
Fast Food with Drive Thru Window (934)	KSF	496.12	45.42	51%	49%	32.65	52%	48%	59.00	51%	49%
Project Name	**Quantity (Units)**	**Daily Trips**	**AM Peak Hour Trips**			**PM Peak Hour Trips**			**Saturday Mid-Day Peak Hour Trips**		
			Total	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**
Costco Warehouse	152.2	12,065	75	52	22	1,091	535	557	1,490	760	730
To Fast Food			-	-	-	*-76*	*-43*	*-33*	*-139*	*-80*	*-59*
Costco Gas Station	30.0	-	449	229	220	-	-	-	-	-	-
To Fast Food			*-46*	*-18*	*-28*	-	-	-	-	-	-
Commercial Retail	63.3	3,286	73	45	28	294	141	153	423	203	220
To Fast Food			*-6*	*-3*	*-3*	*-76*	*-43*	*-33*	*-139*	*-80*	*-59*
Fast Food with Drive Thru Window	6.8	3,374	309	158	151	222	115	107	401	205	197
To Costco Warehouse			-	-	-	*-76*	*-33*	*-43*	*-139*	*-59*	*-80*
To Costco Gas Station			*-46*	*-28*	*-18*	-	-	-	-	-	-
To Commercial Retail			*-6*	*-3*	*-3*	*-76*	*-33*	*-43*	*-139*	*-59*	*-80*
New Project Driveway Trips		**18,724**	**801**	**432**	**369**	**1,304**	**639**	**664**	**1,758**	**890**	**869**
Costco - Pass-by		*-3,016*	-	-	-	*-254*	*-123*	*-131*	*-338*	*-170*	*-168*
Costco Gas Station - Pass-by		-	*-101*	*-53*	*-48*	-	-	-	-	-	-
Commercial Retail - Passby & Diverted Link		*-1,094*	*-7*	*-4*	*-3*	*-74*	*-33*	*-41*	*-74*	*-32*	*-42*
Fast Food with Drive Thru Window - Pass-by		*-1,653*	*-126*	*-62*	*-64*	*-35*	*-25*	*-10*	*-62*	*-43*	*-18*
Costco - Diverted Link		*-3,800*	-	-	-	*-325*	*-157*	*-168*	*-284*	*-143*	*-141*
Net New Project Trips		**9,160**	**568**	**313**	**255**	**616**	**301**	**315**	**1,001**	**502**	**500**

Notes:

1. 1ksf = 1000 square feet

2. Trip rates based on ITE Trip Generation Manual 9th edition fitted curve rates for Commercial (820). Costco warehouse/gas station rates based on Costco provided information attached in Appendix B.

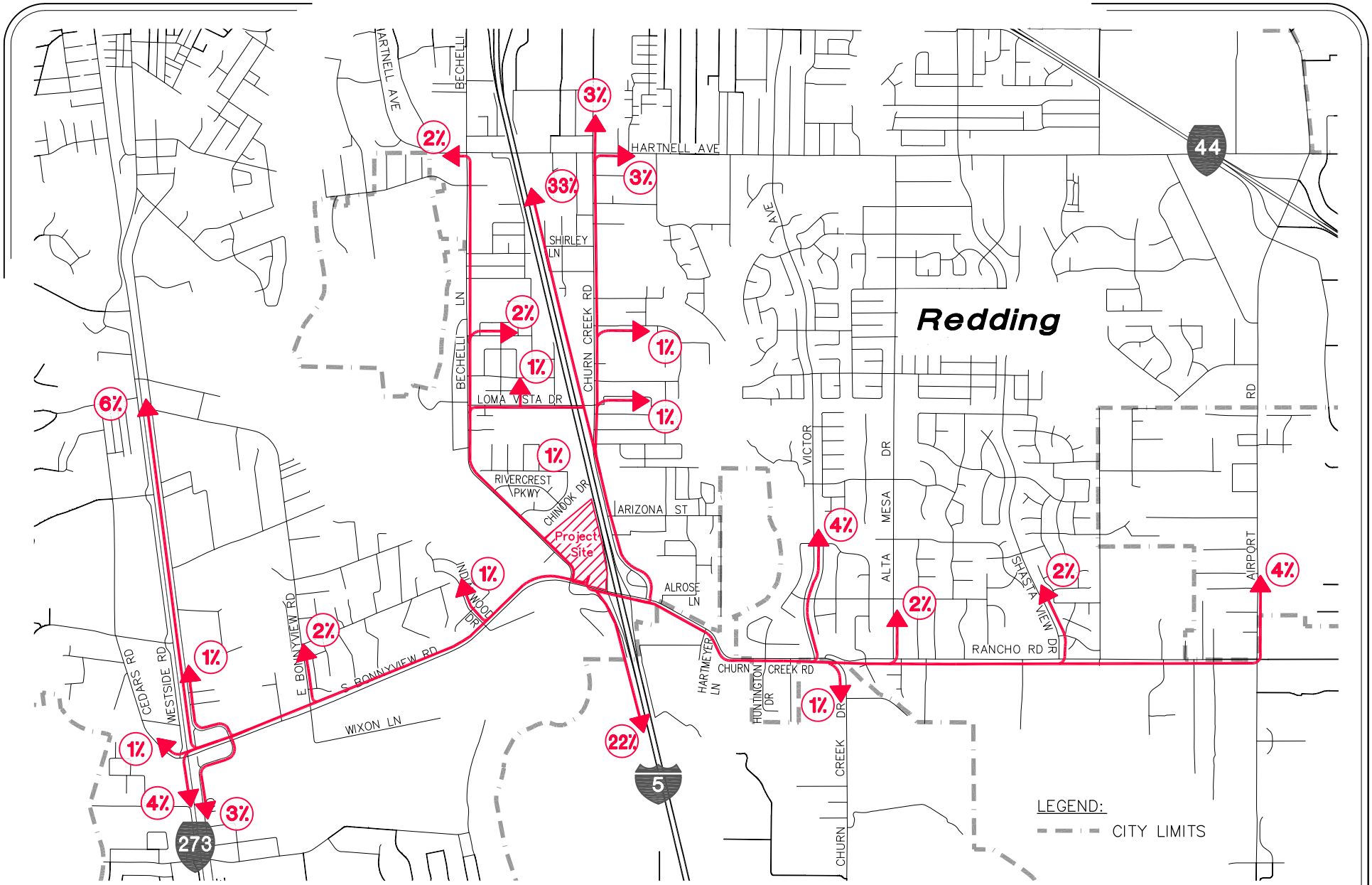
3. Costco Gas Station trip generation combined with Costco Warehouse rate for PM and Saturday mid-day peak hour.

As presented within Table 10, the proposed project is projected to generate approximately 568 AM, 616 PM and 1,001 Saturday peak hour net new trips.

The proposed project is projected to generate approximately 96,000 daily VMT within Shasta County.

Project Trip Distribution

The proposed project trip distribution was developed based on the Shasta County Regional Transportation Agency model. Figure 6 presents the project related trip distribution based on the current roadway circulation system.



River Crossing Marketplace Specific Plan

Figure 6

Project Trip Distribution

Alternative Transportation Modes

The following section presents the existing alternative transportation modes. All off-site and on-site mitigations would satisfy all analysis scenarios.

Pedestrian Facilities

Bechelli Lane, from Chinook Drive to S. Bonnyview Road, does not contain a continuous sidewalk along either the easterly or westerly sides of the roadway. At the intersection of Chinook Drive and Bechelli Lane, sidewalks exist on the easterly side of Bechelli Lane for approximately 605 ft. From the intersection of S. Bonnyview Road and Bechelli Lane, sidewalks exist on the westerly side of Bechelli Lane for approximately 760 ft. to the north. No marked crosswalks are present within this segment of Bechelli Lane between Chinook Drive and S. Bonnyview Road.

S. Bonnyview Road, from Bechelli Lane to I-5 SB Off/On Ramps at S. Bonnyview Road, does not contain continuous sidewalks along the northerly side of the roadway. Yet, from the intersection of the I-5 SB Off Ramp and S. Bonnyview Road, approximately 385 ft. of sidewalks exist on the southerly side of S. Bonnyview Road. Continuous sidewalks are present along the northerly side of S. Bonnyview Rd between the I-5 SB Ramps and Bechelli Lane.

Currently pedestrian activity is very light on stated roadways due to lack of connectivity and significant development in the immediate project vicinity. With the development of the proposed project, the pedestrian traffic is expected to increase slightly due to its commercial and retail components located within close proximity to surrounding residential developments and employment centers.

Project Frontage

The project proposes to provide continuous sidewalks along the project frontage.

On-Site

Pedestrian sidewalks, crosswalks, and accessible paths of travel should be provided within the project area as follows:

- Within the developed core to allow easy access to each building, plaza and crosswalk
- Where feasible, configure sidewalks to channel pedestrians to crosswalks
- Between public streets and the developed core

Bicycle Facilities

Within the City of Redding and Shasta County, the goals for bicycle and trail facilities are contained in the Bikeway Action Plan 2010-2015 (http://healthyshasta.org/downloads/biking/ReddingBikePlan2010.pdf), and the *Shasta County 2010 Bicycle Transportation Plan* (http://www.co.shasta.ca.us/docs/Public_Works/docs/2010-sc-bike-plan.pdf?sfvrsn=2).

As related to the project's study area, the plans identify the following existing and future bicycle facilities:

- Class II: Bechelli Lane from S. Bonnyview Road to Chinook Drive (Existing)
- Class II: S. Bonnyview Road from I-5 SB Ramps to Bechelli Lane (Proposed)

The California Streets and Highways Code defines the various classes of bicycle facilities as follows:

> *(a) Bike paths or shared use paths, also referred to as "Class I bikeways", which provide a completely separated right-of-way designated for the exclusive use of bicycles and pedestrians with cross-flows by motorists minimized.*
>
> *(b) Bike lanes, also referred to as "Class II bikeways", which provide a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.*
>
> *(c) Bike routes, also referred to as "Class III bikeways", which provide a right-of-way on-street or off-street, designated by signs or permanent markings and shared with pedestrians and motorists.*
>
> *(d) Cycle tracks or separated bikeways, also referred to as "Class IV bikeways", which promote active transportation and provide a right-of-way designated exclusively for bicycle travel adjacent to a roadway and which are separated from vehicular traffic. Types of separation include, but are not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.*

Under existing conditions, the study roadways have very light bicycle use. With development of the proposed project, the bicycle traffic is expected to increase slightly due to its commercial and retail components located within close proximity to surrounding residential developments.

Project Frontage

A new 6-ft. wide Class II bicycle facility is proposed on the northerly side of S. Bonnyview Road along the project frontage. All off-site roadway improvements would be designed to accommodate bicycle traffic consistent with the City and County adopted plans.

On-Site

The implementation of the City's development standards will satisfy the transportation needs of bicyclists.

Transit Services

Existing transit service is provided primarily by the Redding Area Bus Authority (RABA). RABA provides fixed route services, express route services and demand response services to the general public within the urbanized area of the Shasta County. RABA operates 15 fixed routes within the Cities of Redding, Shasta Lake and Anderson with the route maps available at: http://www.rabaride.com/stops.html.

Existing conditions indicate the absence of fixed route transit services on Bechelli Lane, S. Bonnyview Road or Churn Creek Road within the proposed project vicinity. The nearest bus stop to the proposed project is located at Loma Vista Drive and Bechelli Lane (near Lassen School), and is served by Route 4. The proposed project site is approximately 0.8 miles from this bus stop on Loma Vista Drive and Bechelli Lane.

The proposed project is expected to generate moderate demand for transit service.

Project Frontage

The proposed project should provide a transit stop along the project frontage in accordance with the City's development standards.

On-Site

Accessible paths of travel will be provided between the project's buildings and public right-of-way.

Existing Plus Project Conditions

The *Existing Plus Project* conditions is the analysis scenario in which traffic impacts associated with the proposed project are investigated in comparison to the *Existing* conditions. *Existing Plus Project* weekday AM and PM and Saturday mid-day peak hour intersection traffic operations were quantified by superimposing traffic generated by the proposed project onto *Existing* conditions.

Figure 7A presents the *Existing Plus Project* traffic volumes for the weekday AM and PM peak hour scenarios. Figure 7B presents the *Existing Plus Project* traffic volumes for the Saturday mid-day peak hour scenario. Figure 8 presents the *Existing Plus Project* ramp and freeway mainline volumes.

Intersection Operations

Table 11 presents a summary of the intersection operations for the weekday AM and PM and Saturday mid-day peak hour scenarios for the Existing Plus Project conditions.

TABLE 11
EXISTING PLUS PROJECT INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	35.6	D	-	32.1	C	-	27.1	C	-
2	S Bonnyview Rd/ Eastside Rd	Signal	D	31.2	C	-	36.9	D	-	22.4	C	-
3	S Bonnyview Rd/ E Bonnyview Rd	Signal	D	28.8	C	-	29.7	C	-	13.7	B	-
4	S Bonnyview Rd/ Indianwood Dr	Signal	D	4.8	A	-	8.3	A	-	5.1	A	-
5	S Bonnyview Rd/ Bechelli Ln	Signal	D	26.7	C	-	40.8	D	-	25.6	C	-
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	21.1	C	-	22.4	C	-	15.0	C	-
6B	S. Bonnyivew Rd/ S. Bonnyview Dwy	TWSC	D	34.8	D	-	22.1	C	-	21.6	C	-
7	**S Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**62.3**	**E**	**-**	**74.4**	**E**	**-**	25.9	C	-
8	**S Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**73.0**	**E**	**-**	**67.5**	**E**	**-**	38.9	D	-
9	S Bonnyview Rd/ Churn Creek Rd	Signal	D	20.8	C	-	22.6	C	-	21.1	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	12.3	B	-	16.4	C	-	13.7	B	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	21.4	C	-	23.9	C	-	15.2	C	-
12	Churn Creek Rd/ Huntington Dr	TWSC	D	26.5	D	-	21.5	C	-	16.4	C	-
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	20.5	C	-	**37.3**	**E**	**No**	17.8	C	-
14	Churn Creek Rd/ Rancho Rd	TWSC	C	16.9	C	-	17.8	C	-	11.1	B	-
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	13.6	B	-	11.9	B	-	10.9	B	-
16	Rancho Rd/ Shasta View Dr	TWSC	C	18.5	C	-	12.3	B	-	11.0	B	-
17	Rancho Rd/ Airport Rd	Signal	C	20.1	C	-	25.0	C	-	13.9	B	-
18	Blue Shield Dwy/ Middle Dwy	Signal	C	18.7	B	-	22.9	C	-	20.2	C	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	12.3	B	-	13.5	B	-	11.0	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	14.4	B	-	13.1	B	-	10.7	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**39.8**	**E**	**No**	**44.5**	**E**	**No**	13.9	B	-
22	Bechelli Ln/ Hartnell Ave	Signal	C	32.9	C	-	30.8	C	-	21.4	C	-
23	Churn Creek Rd/ Public ROW to Chevron	TWSC	C	13.3	B	-	15.0	C	-	11.8	B	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	11.8	B	-	10.9	B	-	10.1	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	16.5	B	-	13.5	B	-	14.0	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	31.5	C	-	12.9	B	-	7.3	A	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**40.5**	**D**	**-**	**43.4**	**D**	**-**	29.5	C	-
28	Bechelli Ln/ Northern Dwy	TWSC	C	15.4	C	-	19.6	C	-	14.9	B	-
29	Bechelli Ln/ Southern Dwy	TWSC	C	12.2	B	-	11.0	B	-	11.2	B	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*

As presented in Table 11, all study intersections except for the following, are projected to operate at or above the threshold LOS for the *Existing Plus Project* conditions:

- Intersection 7 - S. Bonnyview Road & I-5 SB Ramps
- Intersection 8 - S. Bonnyview Road & I-5 NB Ramps
- Intersection 13 - Churn Creek Road & Victor Avenue
- Intersection 21 - Bechelli Lane & Loma Vista Drive
- Intersection 27 - Churn Creek Road & Hartnell Avenue

Roadway Segment Operations

Table 12 presents a summary of the *Existing Plus Project* roadway segment operations.

TABLE 12
EXISTING PLUS PROJECT ROADWAY OPERATIONS

#	Roadway Segment	Roadway Type[1]	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	21.3	D	20.2	D	23.4	C
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	525	C	540	C	366	A
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	298	A	296	A	222	A
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	C	372	A	520	C	378	A
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	427	A	539	B	284	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Dvided Arterial	C	310	A	286	A	192	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	179	A	176	A	137	A

Notes:
1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines
2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.
3. Volume indicates Maximum Peak Hour Volume Per Lane.
Volumes are presented for all roadway segments except S. Bonnyview Rd between SR 273 & Churn Creek Rd.

As presented in Table 12, all study roadway segments are projected to operate at or above the target LOS.

Intersection Queues

Tables 13A and 13B present a summary of the *Existing Plus Project* queues obtained for critical intersections at the S. Bonnyview Road, Bechelli Lane and Churn Creek Road corridors.

TABLE 13A
EXISTING PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Existing 95th Percentile Queue (ft)			Existing Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***								
	Eastbound Left	Signal	***249***	145	126	***382***	***415***	***272***	200
	Eastbound Thru		269	237	124	782	750	403	
	Eastbound Thru/Right		147	184	68	788	740	331	
	Westbound Left/U-Turn		50	50	31	62	130	54	140
	Westbound Thru		187	212	119	249	339	181	
	Westbound Right		107	62	40	154	149	108	
	Northbound Thru/Left		62	79	48	66	83	48	
	Northbound Right		***45***	***52***	***36***	***56***	***57***	***36***	30
	Southbound Left		109	203	104	286	394	340	
	Southbound Left/Thru		77	201	79	226	392	367	
	Southbound Right		90	***160***	75	***125***	***267***	***252***	110
7	***S Bonnyview Rd & I-5 SB Ramps***								
	Eastbound Thru	Signal	***316***	207	125	***426***	***435***	***479***	250
	Eastbound Right		105	169	58	105	***254***	141	250
	Westbound Left		173	214	156	173	230	156	
	Westbound Thru		106	105	61	130	157	146	
	Southbound Left/Thru		117	164	110	***558***	***548***	***437***	175
	Southbound Right		331	264	126	567	528	538	
8	***S Bonnyview Rd & I-5 NB Ramps***								
	Eastbound Left	Signal	496	442	347	496	442	482	
	Eastbound Thru		488	330	201	488	406	239	
	Westbound Thru		188	236	137	196	249	193	
	Westbound Right		***134***	97	52	***158***	***160***	107	110
	Northbound Thru/Left		386	216	174	552	342	316	
	Northbound Right		205	98	73	***366***	104	73	285
9	***S Bonnyview Rd & Churn Creek Rd***								
	Eastbound Left	Signal	***196***	***196***	***137***	***196***	***206***	***147***	130
	Eastbound Thru		155	194	86	164	233	137	
	Eastbound Right		7	28	3	7	28	3	115
	Westbound Left		-	9	8	-	9	9	75
	Westbound Thru		135	131	78	135	144	78	
	Westbound Thru/Right		213	164	82	237	176	108	
	Northbound Left/Thru		28	29	25	28	29	26	
	Northbound Right		11	14	10	11	15	10	
	Southbound Thru/Left		119	169	96	119	177	111	
	Southbound Right		103	142	87	124	142	102	

TABLE 13B
EXISTING PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Existing 95th Percentile Queue (ft)			Existing Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***								
	Eastbound Left/Thru/Right	Signal	147	296	100	147	296	100	
	Westbound Left/Thru		4	5	-	6	7	-	
	Westbound Thru/Right		10	5	3	17	5	3	
	Northbound Left/Thru/Right		-	31	26	-	31	26	
	Southbound Left		29	36	30	32	36	30	
	Southbound Right		64	60	58	69	60	58	
22	***Bechelli Ln & Hartnell Ave***								
	Eastbound Left	Signal	24	70	32	24	70	32	140
	Eastbound Thru		99	187	82	99	187	82	
	Eastbound Right		14	70	25	18	71	32	140
	Westbound Left		***222***	***356***	145	***222***	***356***	145	150
	Westbound Thru		148	134	76	148	134	76	
	Westbound Right		23	41	36	23	41	36	155
	Northbound Left		***334***	***167***	***93***	***344***	***174***	***101***	50
	Northbound Thru		167	166	89	167	166	89	
	Southbound Left		***143***	***206***	***113***	***143***	***206***	***113***	50
	Southbound Thru		123	155	68	123	155	70	
25	***Churn Creek Rd & Loma Vista Dr***								
	Eastbound Left/Thru/Right	Signal	152	88	-	157	95	41	
	Westbound Left/Thru/Right		48	26	22	51	30	28	
	Northbound Left		***117***	44	37	***117***	44	37	60
	Northbound Thru		161	117	93	168	124	104	
	Southbound Left		22	31	15	22	32	15	75
	Southbound Thru		117	184	118	130	194	132	
27	***Churn Creek Rd & Hartnell Ave***								
	Eastbound Left	Signal	93	***113***	65	93	***114***	67	110
	Eastbound Thru		146	246	110	146	249	113	
	Eastbound Right		58	52	5	58	52	5	75
	Westbound Left		***288***	***243***	***168***	***298***	***254***	***185***	75
	Westbound Thru		184	182	112	184	182	113	
	Westbound Right		59	61	63	59	61	63	205
	Northbound Left		***420***	***150***	102	***420***	***151***	104	115
	Northbound Thru		508	294	196	526	307	214	
	Southbound Left		***161***	***581***	***368***	***161***	***587***	***376***	110
	Southbound Thru		260	335	196	266	344	209	

Note: ***Bold*** text indicates queues that exceed available storage

On-Site Driveway Queues

Table 14 presents the 95th percentile on-site queues for proposed driveways for the *Existing Plus Project* conditions.

TABLE 14
EXISTING PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS FOR DRIVEWAYS

Int. #	Intersection/Approach	Control Type	Existing Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
6B	***S. Bonnyview Rd & S. Bonnyview Dwy***					
	Southbound Right	TWSC	70	75	67	
18	***Bechelli Lane & Blue Shield Dwy/Middle Dwy***					
	Westbound Left	Signal	62	782	314	
	Westbound Left/Thru		68	808	312	
	Westbound Right		17	***103***	***66***	60
	Northbound Right		14	54	85	
	Southbound Left		55	***192***	102	125
28	***Bechelli Lane & Northern Dwy***					
	Westbound Left/Right	TWSC	51	194	69	
	Southbound Left		9	19	25	50
29	***Bechelli Lane & Southern Dwy***					
	Westbound Right	TWSC	57	67	52	

Note: ***Bold*** text indicates queues that exceed available storage

As shown in Table 14, the 95th percentile queuing is presented for project driveways for current roadway conditions without any intersection and/or roadway improvements. The 95th percentile onsite queuing is projected to be approximately 32 vehicles for the westbound Left/Thru lane at the intersection of Bechelli Lane & Blue Shield Driveway/Middle Driveway for PM peak hour (based on an average length of 25 feet per vehicle). This queuing is due to the queue spillback from the intersection of Bechelli Lane/Bonnyview Road intersection. Table 37B presents the mitigated queues and the potential mitigations are provided in a later section of the report.

Freeway and Ramp Operations

Table 15 presents a summary of the *Existing Plus Project* ramp merge, diverge, and freeway mainline operations.

TABLE 15
EXISTING PLUS PROJECT RAMP AND FREEWAY OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	719	20.8	C	515	17.7	B	178	19.7	C
2	Bonnyview Rd to Cypress Ave NB	D	Mainline	3	2700	16.0	B	2,276	13.4	B	2,705	16.0	B
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	866	19.0	B	836	16.1	B	752	18.1	B
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	692	17.9	B	585	14.5	B	513	17.1	B
5	Knighton Rd to Bonnyview Rd NB	D	Mainline	3	2526	14.9	B	2,025	12.0	B	2,466	14.6	B
6	Knighton Rd to Bonnyview Rd NB	D	Mainline	2	2526	22.4	C	2,025	18.0	B	2,466	21.9	C
7	Knighton Rd On Ramp NB	D	Merge	1	298	25.2	C	261	20.6	C	272	24.5	C
8	Knighton Rd Off Ramp SB	D	Diverge	1	243	13.6	B	362	28.0	C	296	26.0	C
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	1316	11.7	B	2,773	24.8	C	2,567	22.8	C
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	1316	7.8	A	2,773	16.4	B	2,567	15.2	B
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	476	11.9	B	821	20.1	C	513	18.0	B
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	705	12.2	B	826	19.9	B	678	18.2	B
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	1545	9.1	A	2,778	16.4	B	2,732	16.1	B
14	Cypress Ave On Ramp SB	D	Merge	1	359	11.6	B	814	19.0	C	320	17.7	B

Notes:
Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

As presented in Table 15, all study ramps and freeway segments are projected to operate at or below the target LOS.

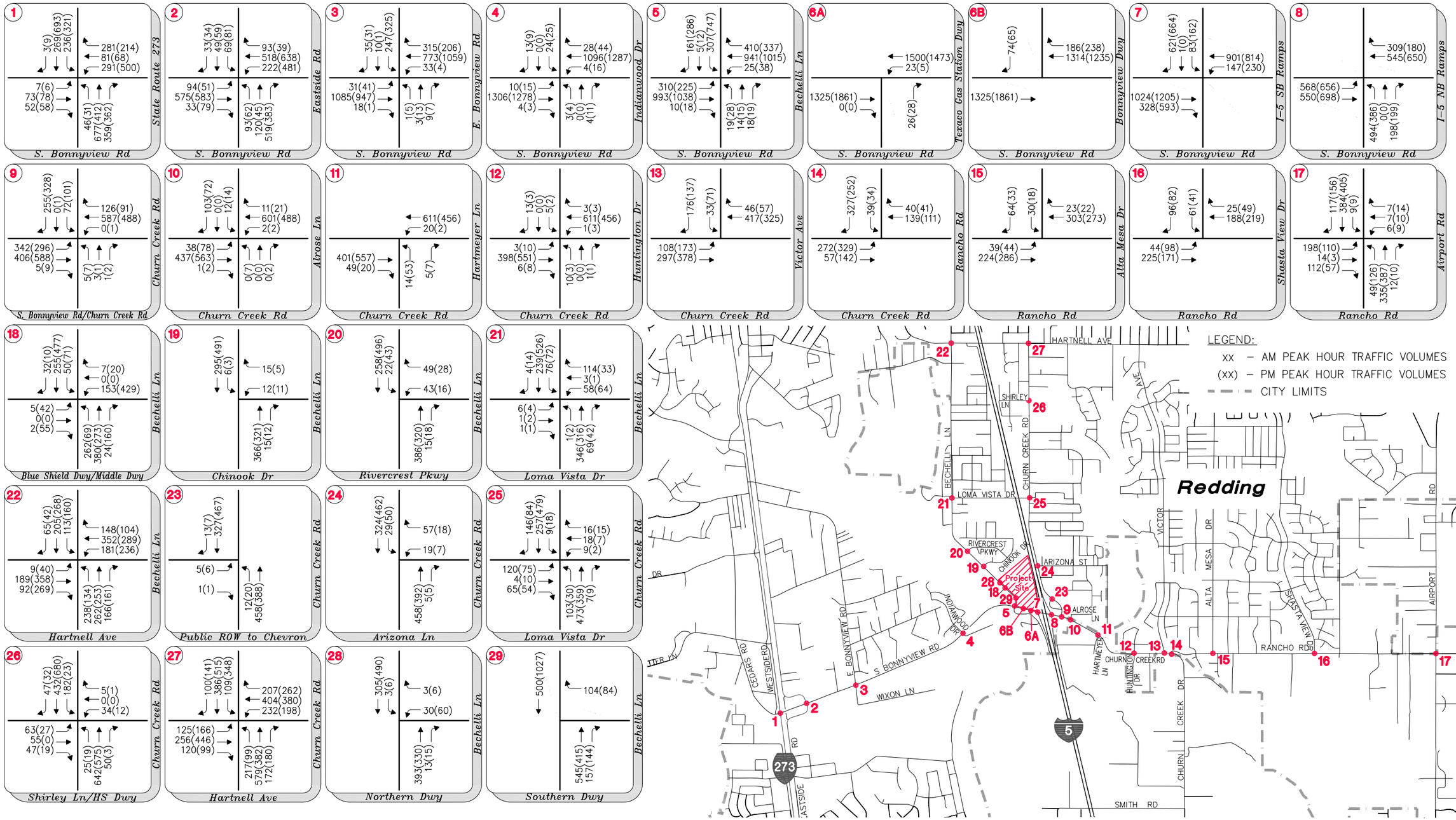


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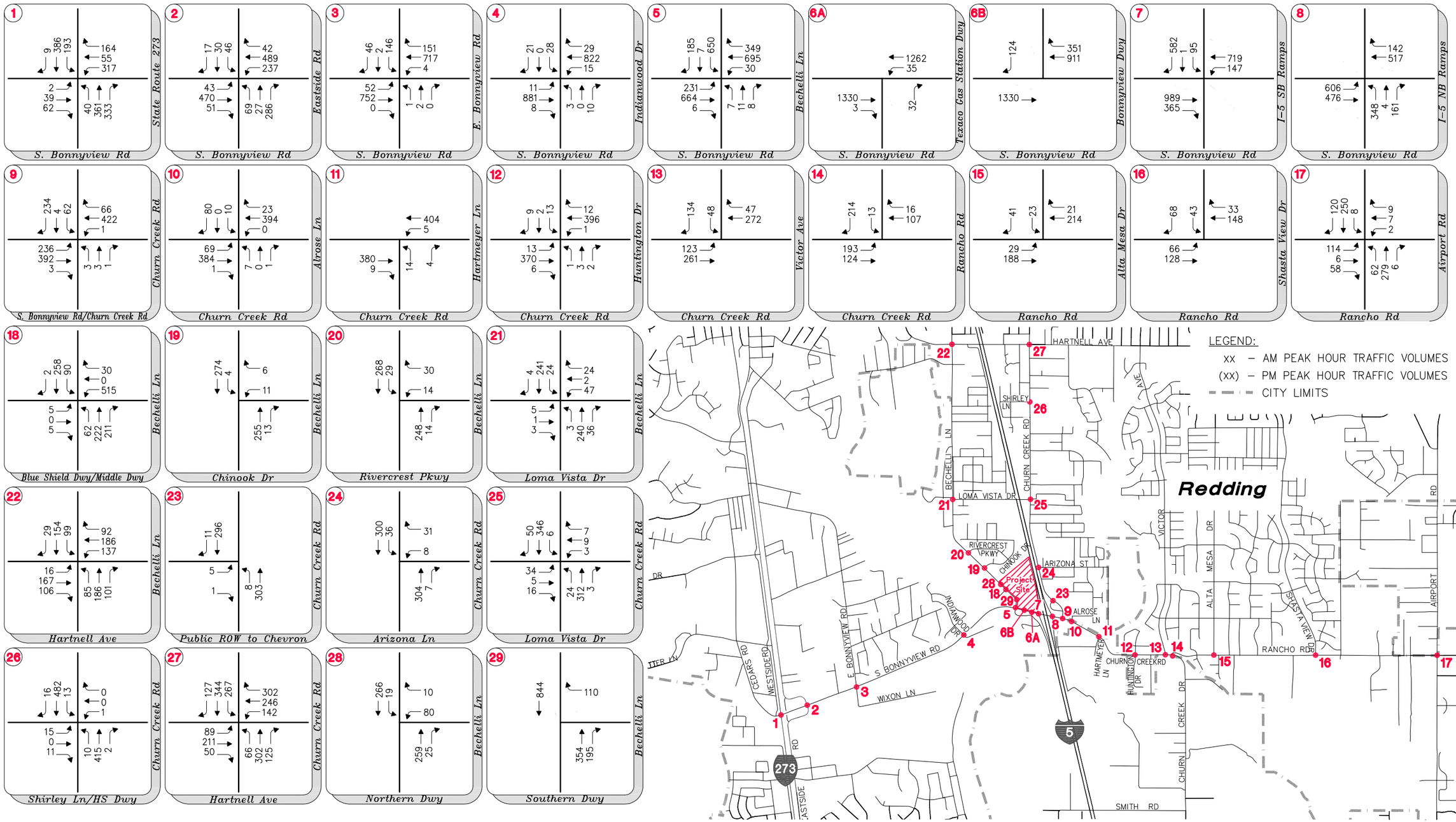
Figure 7A

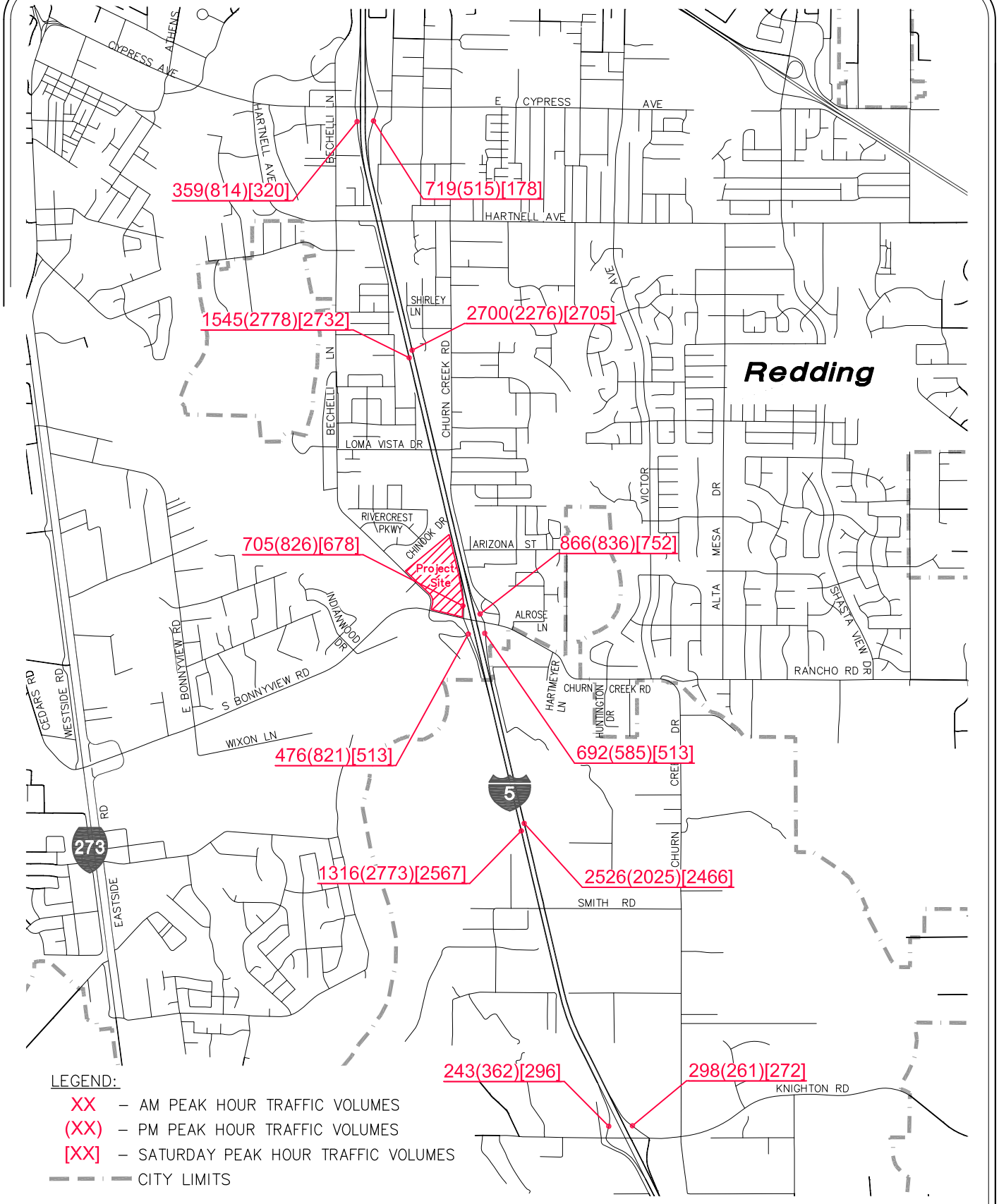
Existing Plus Project Weekday AM and PM Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR

Figure 7B

Existing Plus Project Saturday Mid-Day Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR Figure 8

Existing Plus Project Ramp and Freeway Mainline Traffic Volumes

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Short Term (Year 2020) Conditions

Short Term conditions refer to an analysis scenario at the estimated occupancy year for the proposed project. Therefore, the *Short Term* year of analysis for this study is assumed to be Year 2020.

The *Short Term* (Year 2020) forecast traffic volumes were developed using the Shasta County Travel Demand Model (SCTDM). Specifically, future volumes within the vicinity of the S. Bonnyview Interchange were forecasted using the methodology discussed within the attached memorandum (see Appendix F).

The *Short Term* (Year 2020) lane geometrics and controls are assumed to remain consistent with Existing conditions except for the intersection of S Bonnyview Road/I-5 NB Ramps and S Bonnyview Road/I-5 SB Ramps. An additional eastbound left-turn lane will be completed at the intersection of S Bonnyview Road/I-5 NB Ramps and an additional eastbound thru lane will be constructed at the intersection of S Bonnyview Road/I-5 SB Ramps by Churn Creek Marketplace.

Figures 9A and 9B present the *Year 2020 No Project* conditions for the weekday AM and PM and Saturday mid-day peak hour volumes, respectively. Figure 10 presents the ramp and freeway mainline volumes for the *Year 2020 No Project* conditions.

Year 2020 No Project Conditions

Year 2020 No Project conditions refer to analysis scenarios that would exist following approximately four years of development in the City of Redding and Shasta County.

Intersection Operations

Table 16 presents a summary of the *Year 2020 No Project* study intersection LOS conditions.

TABLE 16
YEAR 2020 NO PROJECT INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	36.0	D	-	34.6	C	-	27.2	C	-
2	S Bonnyview Rd/ Eastside Rd	Signal	D	31.9	C	-	38.7	D	-	22.7	C	-
3	S Bonnyview Rd/ E Bonnyview Rd	Signal	D	33.8	C	-	31.0	C	-	14.5	B	-
4	S Bonnyview Rd/ Indianwood Dr	Signal	D	6.1	A	-	8.0	A	-	6.9	A	-
5	S Bonnyview Rd/ Bechelli Ln	Signal	D	20.1	C	-	21.6	C	-	15.0	B	-
6A	S Bonnyview Rd/ Texaco Dwy	TWSC	D	16.9	C	-	19.1	C	-	12.8	B	-
7	S Bonnyview Rd/ I-5 SB Ramps	Signal	D	29.6	C	-	21.0	C	-	17.5	B	-
8	S Bonnyview Rd/ I-5 NB Ramps	Signal	D	30.1	C	-	24.5	C	-	23.1	C	-
9	S Bonnyview Rd/ Churn Creek Rd	Signal	D	31.1	C	-	30.3	C	-	28.8	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	13.3	B	-	20.3	C	-	14.3	B	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	23.3	C	-	27.7	D	-	14.9	B	-
12	Churn Creek Rd/ Huntington Dr	TWSC	D	28.4	D	-	20.3	C	-	18.6	C	-
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	26.9	D	-	**53.7**	**F**	**Yes**	18.5	C	-
14	Churn Creek Rd/ Rancho Rd	TWSC	C	21.2	C	-	21.8	C	-	11.8	B	-
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	15.3	C	-	12.3	B	-	11.0	B	-
16	Rancho Rd/ Shasta View Dr	TWSC	C	21.0	C	-	12.9	B	-	11.2	B	-
17	Rancho Rd/ Airport Rd	Signal	C	29.9	C	-	21.8	C	-	16.7	B	-
18	Bechelli Ln/ Blue Shield Dwy	Signal	C	7.3	A	-	6.1	A	-	3.2	A	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	12.7	B	-	13.3	B	-	10.8	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	15.3	C	-	12.9	B	-	10.6	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**69.5**	**F**	**No**	**44.8**	**E**	**No**	13.8	B	-
22	Bechelli Ln/ Hartnell Ave	Signal	C	33.1	C	-	31.5	C	-	22.3	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	14.8	B	-	20.4	C	-	19.2	B	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	12.6	B	-	11.2	B	-	10.4	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	18.6	B	-	14.0	B	-	13.5	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	33.9	C	-	14.0	B	-	9.3	A	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**43.3**	**D**	**-**	**47.2**	**D**	**-**	30.5	C	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*

As presented in Table 16, all study intersections, except the intersections listed below, are currently found to operate at or above the target LOS:

- Intersection 13 - Churn Creek Road & Victor Avenue
- Intersection 21 - Bechelli Lane & Loma Vista Drive
- Intersection 27 - Churn Creek Road & Hartnell Avenue

Roadway Segment Operations

Table 17 presents a summary of the *Year 2020* roadway segment operations.

TABLE 17
YEAR 2020 NO PROJECT ROADWAY OPERATIONS

#	Roadway Segment	Roadway Type[1]	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	21.1	D	21.2	D	25.7	C
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	581	D	587	D	370	A
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	335	A	318	A	224	A
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	C	472	C	354	A	237	A
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	450	A	537	B	265	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	335	A	338	A	231	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	205	A	200	A	160	A

Notes:
1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines
2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.
3. Volume indicates Maximum Peak Hour Volume Per Lane.
4. ***Bold*** *= Unacceptable Conditions*

As presented in Table 17, all study roadway segments are projected to operate at or above the target LOS.

Intersection Queues

Tables 18A and 18B present a summary of the *Year 2020 No Project* Queues obtained for critical intersections along the S. Bonnyview Road, Bechelli Lane and Churn Creek Road corridors.

TABLE 18A
YEAR 2020 NO PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2020 No Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***					
	Eastbound Left	Signal	***257***	135	115	200
	Eastbound Thru		202	174	106	
	Eastbound Thru/Right		184	205	117	
	Westbound Left/U-Turn		76	49	40	140
	Westbound Thru		214	225	130	
	Westbound Right		121	53	38	
	Northbound Thru/Left		64	72	54	
	Northbound Right		***58***	***60***	***36***	30
	Southbound Left/U-Turn		98	161	85	
	Southbound Left/Thru		118	204	105	
	Southbound Right		102	***179***	77	110
7	***S Bonnyview Rd & I-5 SB Ramps***					
	Eastbound Thru	Signal	193	188	130	250
	Eastbound Right		111	186	59	250
	Westbound Left		277	293	200	
	Westbound Thru		134	101	78	
	Southbound Left/Thru		***185***	***265***	150	175
	Southbound Right		331	271	141	
8	***S Bonnyview Rd & I-5 NB Ramps***					
	Eastbound Left	Signal	252	252	193	
	Eastbound Thru		173	240	153	
	Westbound Thru		231	252	153	
	Westbound Right		***235***	***132***	71	110
	Northbound Thru/Left		329	237	162	
	Northbound Right		117	194	93	285
9	***S Bonnyview Rd & Churn Creek***					
	Eastbound Left	Signal	***232***	***247***	***209***	130
	Eastbound Thru		258	272	231	
	Eastbound Right		89	115	38	115
	Westbound Left		***112***	***86***	64	75
	Westbound Thru		220	224	110	
	Westbound Thru/Right		366	258	125	
	Northbound Left/Thru		182	169	124	
	Northbound Right		69	43	29	
	Southbound Thru/Left		113	255	223	
	Southbound Right		287	269	137	

TABLE 18B
YEAR 2020 NO PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2020 No Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***					
	Eastbound Left/Thru/Right	Signal	227	398	120	
	Westbound Left/Thru		45	27	-	
	Westbound Thru/Right		70	5	5	
	Northbound Left/Thru/Right		-	41	37	
	Southbound Left		33	50	38	
	Southbound Right		95	62	65	
22	***Bechelli Ln & Hartnell Ave***					
	Eastbound Left	Signal	34	77	37	140
	Eastbound Thru		111	193	86	
	Eastbound Right		22	72	28	140
	Westbound Left		***267***	***376***	***152***	150
	Westbound Thru		173	140	80	
	Westbound Right		23	43	38	155
	Northbound Left		***368***	***175***	***97***	50
	Northbound Thru		183	172	94	
	Southbound Left		***150***	***206***	***115***	50
	Southbound Thru		136	160	73	
25	***Churn Creek Rd & Loma Vista Dr***					
	Eastbound Left/Thru/Right	Signal	174	102	-	
	Westbound Left/Thru/Right		62	38	39	
	Northbound Left		***126***	55	48	60
	Northbound Thru		185	134	108	
	Southbound Left		31	40	22	75
	Southbound Thru		142	216	140	
27	***Churn Creek Rd & Hartnell Ave***					
	Eastbound Left	Signal	95	***118***	71	110
	Eastbound Thru		154	258	120	
	Eastbound Right		67	60	10	75
	Westbound Left		***299***	***290***	***202***	75
	Westbound Thru		210	190	119	
	Westbound Right		78	61	64	205
	Northbound Left		***453***	***162***	110	115
	Northbound Thru		567	325	220	
	Southbound Left		***170***	***612***	***402***	110
	Southbound Thru		279	375	226	

Note: ***Bold*** text indicates queues that exceed available storage

Freeway and Ramp Operations

Table 19 presents a summary of the Year 2020 No Project ramp merge, diverge and freeway mainline operations.

TABLE 19
YEAR 2020 NO PROJECT RAMP AND FREEWAY OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	759	21.8	C	547	18.1	C	173	23.5	C
2	Bonnyview Rd to Cypress Ave NB	D	Mainline	3	2,858	16.9	B	2,329	13.8	B	3,377	20.0	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	930	20.0	C	760	16.2	B	605	21.3	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	685	18.4	B	515	14.7	B	370	20.7	C
5	Knighton Rd to Bonnyview Rd NB	D	Mainline	3	2,613	15.4	B	2,084	12.3	B	3,142	18.6	B
6	Knighton Rd to Bonnyview Rd NB	D	Mainline	2	2,613	23.2	C	2,084	18.5	C	3,142	28.9	D
7	Knighton Rd On Ramp NB	D	Merge	1	286	26.0	C	267	21.1	C	275	30.6	D
8	Knighton Rd Off Ramp SB	D	Diverge	1	235	14.8	B	360	29.8	D	290	27.6	D
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	1,443	12.8	B	2,958	26.8	D	2,734	24.4	C
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	1,443	8.5	A	2,958	17.5	B	2,734	16.2	B
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	500	12.7	B	715	20.8	C	375	18.6	B
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	715	13.0	B	730	20.8	C	490	19.5	B
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	1,658	9.8	A	2,973	17.6	B	2,849	16.8	B
14	Cypress Ave On Ramp SB	D	Merge	1	365	12.1	B	844	20.1	C	320	18.3	B

Notes:
Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

As presented in Table 19, all study ramps and freeway segments are projected to operate at or above the target LOS.

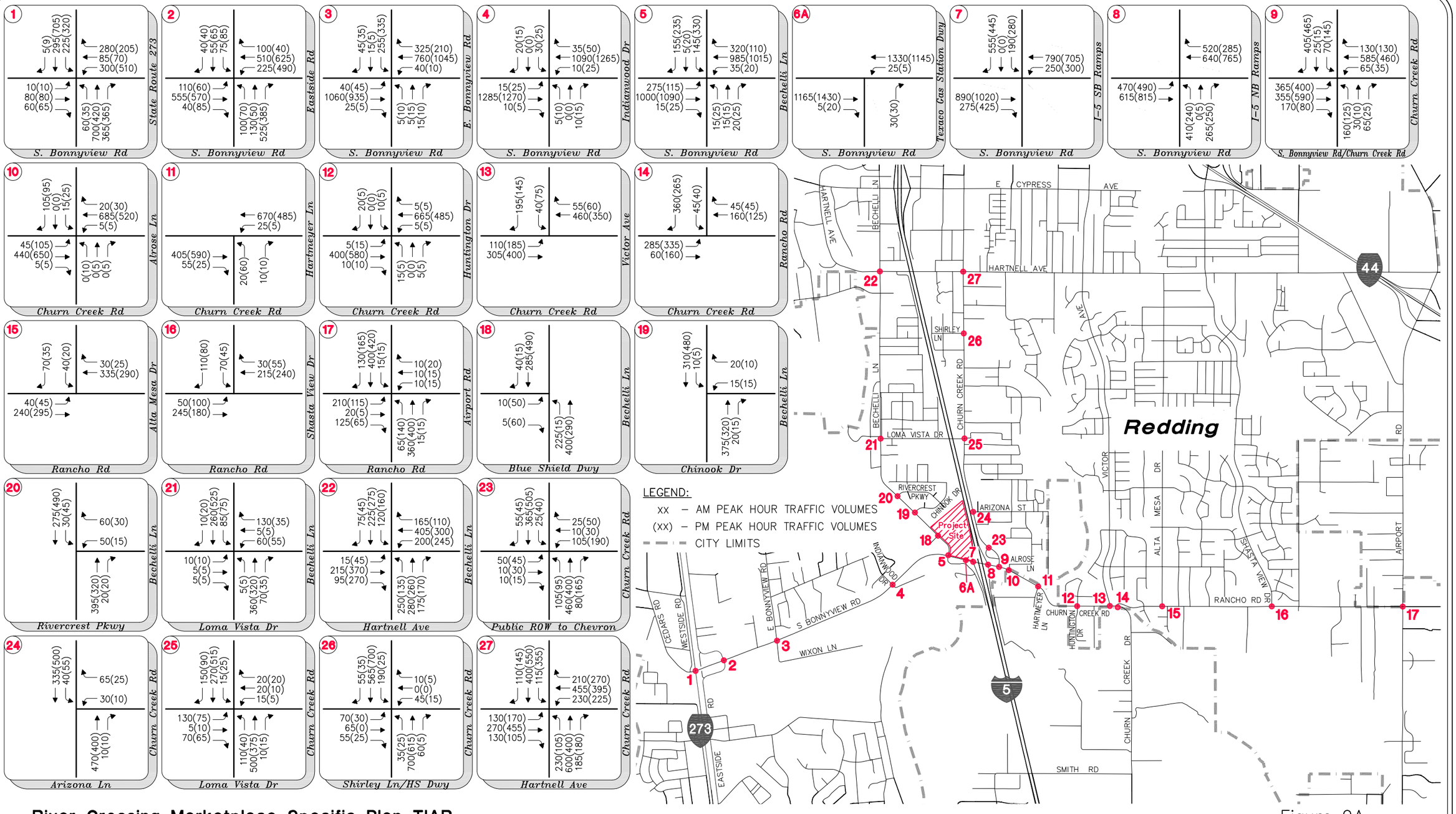

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Figure 9A

Year 2020 No Project Weekday AM and PM Peak Hour Traffic Volumes

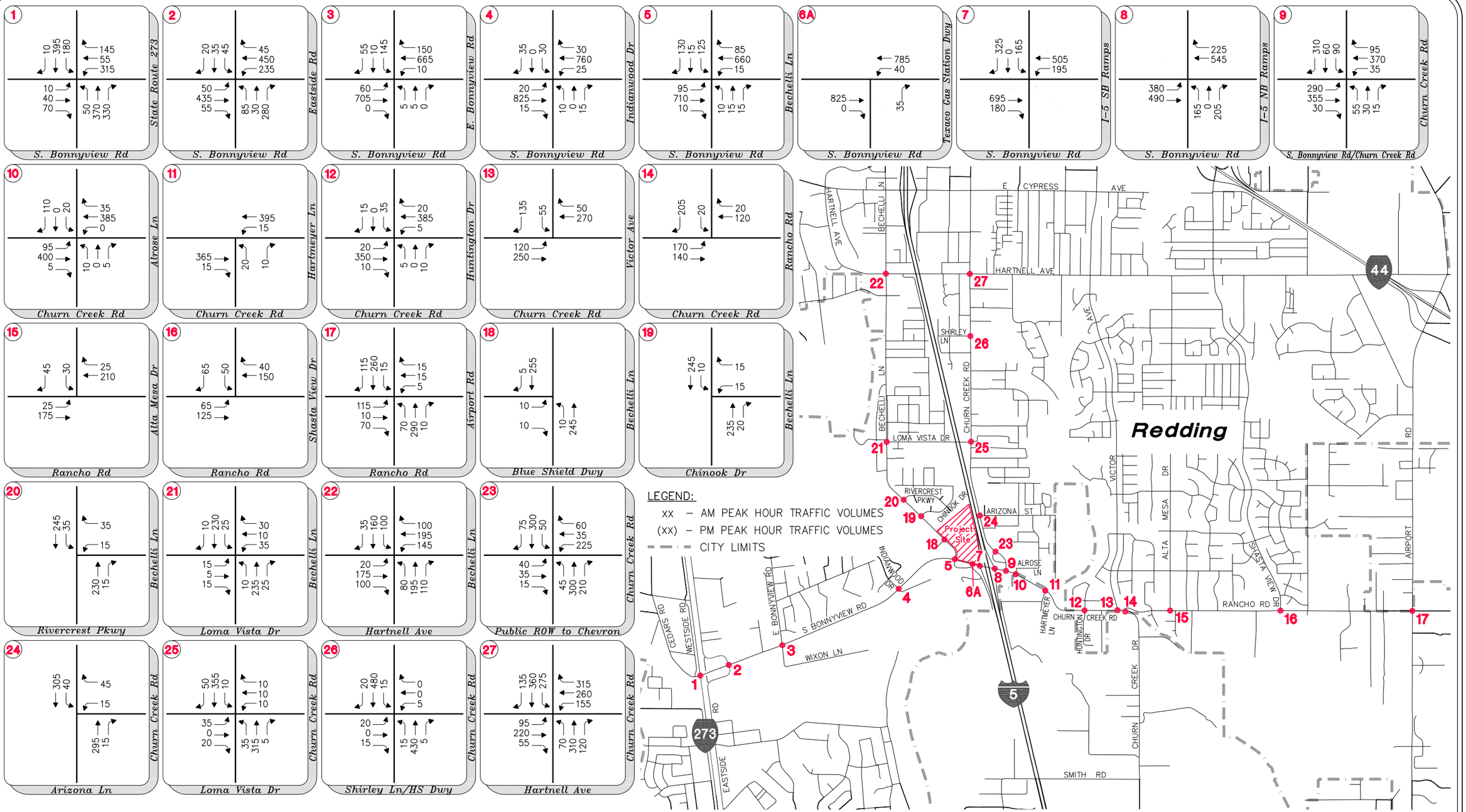

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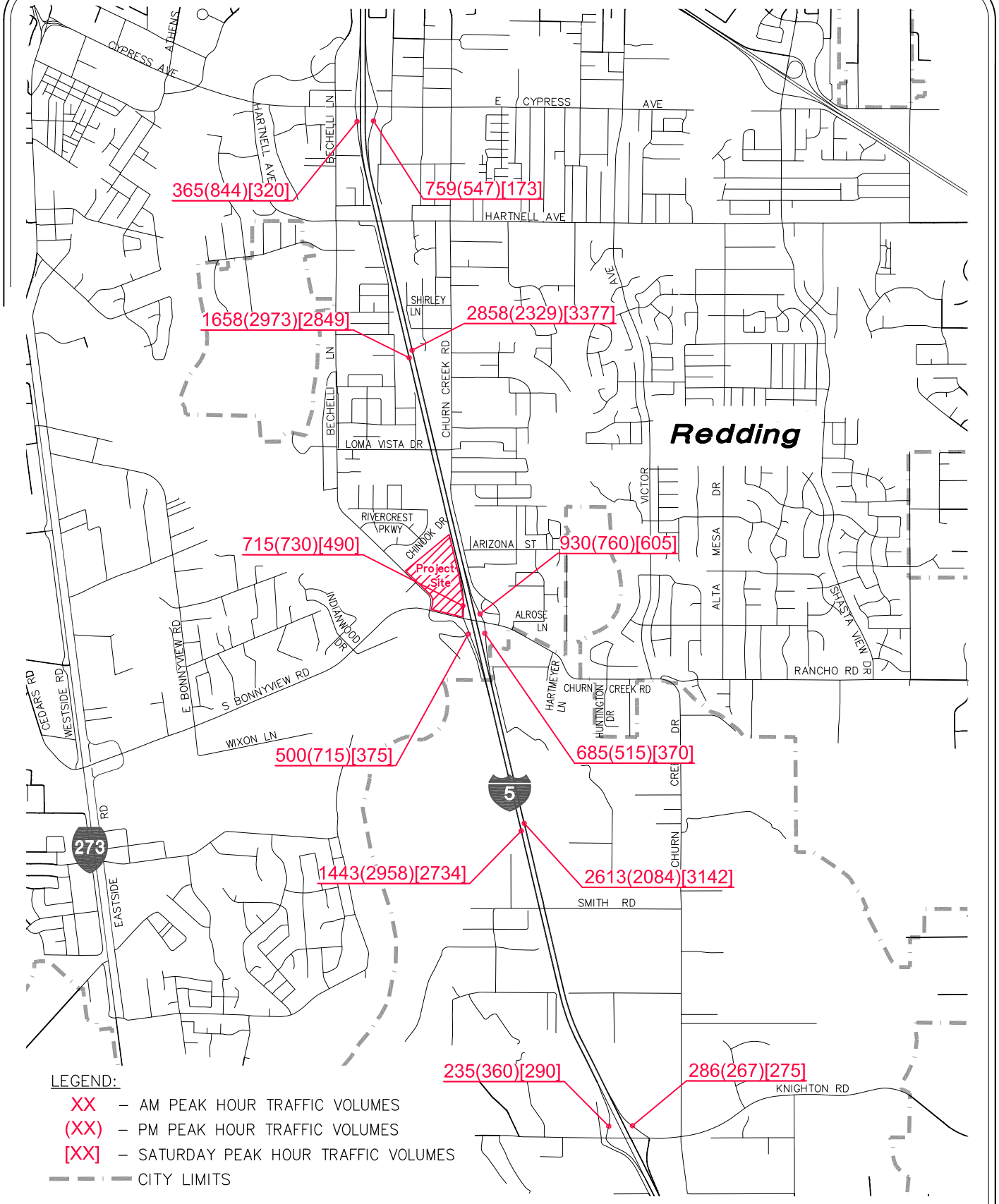
Figure 9B

Year 2020 No Project Saturday Mid-Day Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR Figure 10

Year 2020 No Project Ramp and Freeway Mainline Traffic Volumes

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Year 2020 Plus Project Conditions

Year 2020 Plus Project conditions is the analysis scenario in which traffic impacts associated with the project are investigated in comparison to the *Year 2020 No Project* conditions scenario.

The *Year 2020 Plus Project* conditions were simulated by superimposing traffic generated by the proposed project onto *Year 2020 No Project* traffic volumes.

Figure 11A presents the *Year 2020 Plus Project* traffic volumes for the weekday AM and PM peak hour conditions. Figure 11B presents the *Year 2020 Plus Project* traffic volumes for the Saturday mid-day peak hour conditions. Figure 12 presents the ramp and freeway mainline volumes for the *Year 2020 Plus Project* conditions.

Intersection Operations

Table 20 presents a summary of the intersection operations for the weekday AM and PM and the Saturday mid-day peak hour scenarios for the *Year 2020 Plus Project* conditions.

TABLE 20
YEAR 2020 PLUS PROJECT INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	36.7	D	-	35.2	D	-	27.6	C	-
2	S. Bonnyview Rd/ Eastside Rd	Signal	D	33.0	C	-	40.8	D	-	23.7	C	-
3	S. Bonnyview Rd/ E. Bonnyview Rd	Signal	D	38.4	D	-	32.5	C	-	15.0	B	-
4	S. Bonnyview Rd/ Indianwood Dr	Signal	D	6.3	A	-	8.6	A	-	7.4	A	-
5	S. Bonnyview Rd/ Bechelli Ln	Signal	D	34.9	C	-	46.2	D	-	26.3	C	-
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	19.3	C	-	26.6	D	-	17.0	C	-
6B	S. Bonnyview Rd/ S. Bonnyview Dwy	TWSC	D	27.0	D	-	22.9	C	-	22.3	C	-
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**63.7**	**E**	**-**	**75.2**	**E**	**-**	26.6	C	-
8	S. Bonnyview Rd/ I-5 NB Ramps	Signal	D	39.0	D	-	30.9	C	-	25.1	C	-
9	S. Bonnyview Rd/ Churn Creek Rd	Signal	D	31.1	C	-	30.4	C	-	29.0	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	13.8	B	-	21.6	C	-	15.3	C	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	25.9	D	-	31.7	D	-	16.9	C	-
12	Churn Creek Rd/ Huntington Dr	TWSC	D	32.5	D	-	22.3	C	-	22.4	C	-
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	32.8	D	-	**78.7**	**F**	**Yes**	23.7	C	-
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	24.3	C	-	**25.7**	**D**	**Yes**	12.5	B	-
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	16.1	C	-	12.6	B	-	11.6	B	-
16	Rancho Rd/ Shasta View Dr	TWSC	C	23.2	C	-	13.3	B	-	11.7	B	-
17	Rancho Rd/ Airport Rd	Signal	C	32.8	C	-	25.9	C	-	16.9	B	-
18	Blue Shield Dwy/ Middle Dwy	Signal	C	19.5	B	-	23.5	C	-	21.2	C	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	13.0	B	-	13.7	B	-	11.2	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	16.0	C	-	13.6	B	-	11.2	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**105.3**	**F**	**No**	**59.1**	**F**	**No**	15.5	C	-
22	Bechelli Ln/ Hartnell Ave	Signal	C	33.4	C	-	31.6	C	-	22.5	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	18.1	B	-	23.8	C	-	19.5	B	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	12.8	B	-	11.4	B	-	10.6	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	18.8	B	-	14.2	B	-	14.2	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	34.2	C	-	14.4	B	-	10.5	B	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**44.6**	**D**	**-**	**48.4**	**D**	**-**	31.5	C	-
28	Bechelli Ln/ Northern Dwy	TWSC	C	16.8	C	-	20.9	C	-	15.4	C	-
29	Bechelli Ln/ Southern Dwy	TWSC	C	~~12.4~~ **25.0**	~~B~~ **D**	-	~~10.7~~ **26.5**	~~B~~ **D**	-	~~11.1~~ 21.4	~~B~~ C	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*

As presented in Table 20, all study intersections, except the intersections listed below, are projected to operate at or above the target LOS:

- Intersection 7 - S Bonnyview Road & I-5 SB Ramps
- Intersection 13 - Churn Creek Road & Victor Avenue
- Intersection 14 - Churn Creek Road & Rancho Road
- Intersection 21 - Bechelli Lane & Loma Vista Drive
- Intersection 27 - Churn Creek Road & Hartnell Avenue
- Intersection 29 – Bechelli Lane & Sothern Driveway

Additional details on the delays at Intersection 29 are included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Roadway Segment Operations

Table 21 presents a summary of the Year 2020 Plus Project roadway segment operations.

TABLE 21
YEAR 2020 PLUS PROJECT ROADWAY SEGMENT OPERATIONS

#	Roadway Segment	Roadway Type[1]	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	19.5	D	19.7	D	23.5	C
2	**Churn Creek Rd between S. Bonnyview Rd & Rancho Rd**	**Undivided Arterial**	**D**	**614**	**E**	**623**	**E**	427	B
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	356	A	337	A	256	A
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	C	399	A	530	C	392	A
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	466	A	557	B	303	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	344	A	347	A	246	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	208	A	203	A	165	A

Notes:
1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines
2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.
3. Volume indicates Maximum Peak Hour Volume Per Lane.
*4. **Bold** = Unacceptable Conditions*

As shown in Table 21, all study roadway segments, except the segments listed below, are projected to operate at or above the target LOS:

- Segment 2 - Churn Creek Road between S. Bonnyview Road and Victor Avenue

Intersection Queues

Tables 22A and 22B present a summary of the *Year 2020 Plus Project* queues obtained for critical intersections along S. Bonnyview Road, Bechelli Lane and Churn Creek Road corridors.

TABLE 22A
YEAR 2020 PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2020 No Project 95th Percentile Queue (ft)			Yr 2020 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***								
	Eastbound Left	Signal	***257***	135	115	***300***	***209***	194	200
	Eastbound Thru		202	174	106	290	237	166	
	Eastbound Thru/Right		184	205	117	231	283	165	
	Westbound Left/U-Turn		76	49	40	81	104	81	140
	Westbound Thru		214	225	130	265	277	194	
	Westbound Right		121	53	38	156	96	104	
	Northbound Thru/Left		64	72	54	64	75	54	
	Northbound Right		***58***	***60***	***36***	***58***	***60***	***40***	30
	Southbound Left		98	161	85	192	421	396	
	Southbound Left/Thru		118	204	105	223	402	422	
	Southbound Right		102	***179***	77	***173***	***236***	***272***	110
7	***S Bonnyview Rd & I-5 SB Ramps***								
	Eastbound Thru	Signal	193	188	130	204	193	211	250
	Eastbound Right		111	186	59	140	239	160	250
	Westbound Left		277	293	200	277	293	200	
	Westbound Thru		134	101	78	190	144	160	
	Southbound Left/Thru		***185***	***265***	150	***480***	***523***	***214***	175
	Southbound Right		331	271	141	556	573	355	
8	***S Bonnyview Rd & I-5 NB Ramps***								
	Eastbound Left	Signal	252	252	193	302	278	334	
	Eastbound Thru		173	240	153	194	244	197	
	Westbound Thru		231	252	153	278	264	200	
	Westbound Right		***235***	***132***	71	***253***	***213***	95	110
	Northbound Thru/Left		329	237	162	558	283	298	
	Northbound Right		117	194	93	***393***	194	100	285
9	***S Bonnyview Rd & Churn Creek Rd***								
	Eastbound Left	Signal	***232***	***247***	***209***	***241***	***253***	***209***	130
	Eastbound Thru		258	272	231	278	295	243	
	Eastbound Right		89	115	38	102	115	38	115
	Westbound Left		***112***	***86***	64	***116***	***106***	64	75
	Westbound Thru		220	224	110	310	251	110	
	Westbound Thru/Right		366	258	125	474	331	189	
	Northbound Left/Thru		182	169	124	182	169	124	
	Northbound Right		69	43	29	69	45	30	
	Southbound Thru/Left		113	255	223	132	255	223	
	Southbound Right		287	269	137	365	363	143	

TABLE 22B
YEAR 2020 PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2020 No Project 95th Percentile Queue (ft)			Yr 2020 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***								
	Eastbound Left/Thru/Right	Signal	227	398	120	227	426	171	
	Westbound Left/Thru		45	27	-	79	36	-	
	Westbound Thru/Right		70	5	5	203	21	5	
	Northbound Left/Thru/Right		-	41	37	-	43	37	
	Southbound Left		33	50	38	47	53	43	
	Southbound Right		95	62	65	130	62	65	
22	***Bechelli Ln & Hartnell Ave***								
	Eastbound Left	Signal	34	77	37	34	77	37	140
	Eastbound Thru		111	193	86	111	193	86	
	Eastbound Right		22	72	28	26	72	36	140
	Westbound Left		***267***	***376***	***152***	***267***	***376***	***152***	150
	Westbound Thru		173	140	80	173	140	80	
	Westbound Right		23	43	38	23	43	38	155
	Northbound Left		***368***	***175***	***97***	***377***	***182***	***107***	50
	Northbound Thru		183	172	94	183	172	94	
	Southbound Left		***150***	***206***	***115***	***150***	***206***	***115***	50
	Southbound Thru		136	160	73	136	160	74	
25	***Churn Creek Rd & Loma Vista Dr***								
	Eastbound Left/Thru/Right	Signal	174	102	-	179	108	47	
	Westbound Left/Thru/Right		62	38	39	64	41	43	
	Northbound Left		***126***	55	48	***126***	55	49	60
	Northbound Thru		185	134	108	192	142	119	
	Southbound Left		31	40	22	31	40	22	75
	Southbound Thru		142	216	140	154	226	153	
27	***Churn Creek Rd & Hartnell Ave***								
	Eastbound Left	Signal	95	***118***	71	95	***118***	72	110
	Eastbound Thru		154	258	120	154	258	123	
	Eastbound Right		67	60	10	67	60	10	75
	Westbound Left		***299***	***290***	***202***	***311***	***300***	***221***	75
	Westbound Thru		210	190	119	210	190	120	
	Westbound Right		78	61	64	78	61	64	205
	Northbound Left		***453***	***162***	110	***453***	***162***	112	115
	Northbound Thru		567	325	220	583	337	240	
	Southbound Left		***170***	***612***	***402***	***170***	***612***	***414***	110
	Southbound Thru		279	375	226	286	381	240	

Note: ***Bold*** text indicates queues that exceed available storage

On-Site Driveway Queues

Table 23 presents the 95th percentile queues for proposed driveways for the Year 2020 Plus Project conditions.

TABLE 23
YEAR 2020 PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS FOR DRIVEWAYS

Int. #	Intersection/Approach	Control Type	Year 2020 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
6B	***S. Bonnyview Rd & S. Bonnyview Dwy***					
	Southbound Right	TWSC	65	62	88	
18	***Bechelli Lane & Blue Shield Dwy/Middle Dwy***					
	Westbound Left	Signal	58	512	134	
	Westbound Left/Thru		79	599	201	
	Westbound Right		19	***94***	***86***	60
	Northbound Right		18	60	66	
	Southbound Left		57	115	82	125
28	***Bechelli Lane & Northern Dwy***					
	Westbound Left/Right	TWSC	48	62	73	
	Southbound Left		10	14	15	50
29	***Bechelli Lane & Southern Dwy***					
	Westbound Left	TWSC	95	105	88	
	Westbound Right	TWSC	69	47	47	

As shown in Table 23, the 95th percentile queuing is presented for project driveways for current roadway conditions without any intersection and/or roadway improvements. The 95th percentile onsite queuing is projected to be approximately 25 vehicles for the westbound Left/Thru lane at the intersection of Bechelli Lane & Blue Shield Driveway/Middle Driveway for PM peak hour (based on an average length of 25 feet per vehicle). This queuing is due to the queue spillback from the intersection of Bechelli Lane/Bonnyview Road intersection. Table 37B presents the mitigated queues and the potential mitigations are provided in a later section of the report.

Additional Queue data for the Westbound Left turn for Intersection 29 is included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Freeway and Ramp Operations

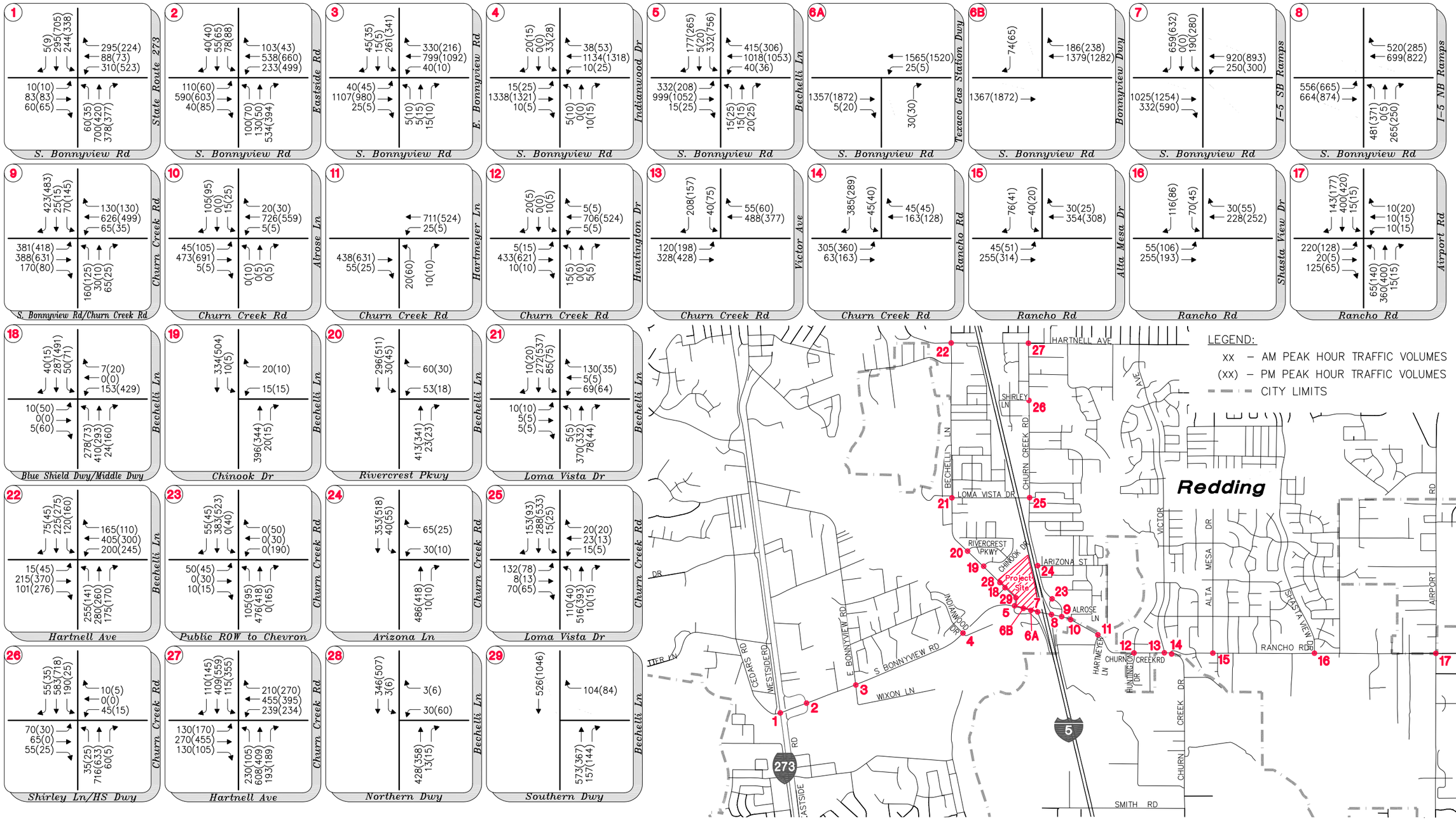
Table 24 presents a summary of the *Existing Plus Project* ramp merge, diverge and freeway mainline operations.

TABLE 24
YEAR 2020 PLUS PROJECT FREEWAY AND RAMP OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	769	22.3	C	560	18.8	C	193	24.4	C
2	Bonnyview Rd to Cypress Ave NB	D	Mainline	3	2,942	17.4	B	2,433	14.4	B	3,542	20.9	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	1,016	20.7	C	935	17.2	B	839	22.8	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	756	19.0	B	646	15.4	B	546	21.6	C
5	Knighton Rd to Bonnyview Rd NB	D	Mainline	3	2,682	15.8	B	2,144	12.7	B	3,249	19.2	B
6	Knighton Rd to Bonnyview Rd NB	D	Mainline	2	2,682	23.9	C	2,144	19.0	C	3,249	30.3	D
7	Knighton Rd On Ramp NB	D	Merge	1	292	26.7	D	273	21.7	C	285	31.6	D
8	Knighton Rd Off Ramp SB	D	Diverge	1	240	15.4	B	366	30.6	D	300	28.7	D
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	1,499	13.3	B	3,035	27.6	C	2,848	25.6	C
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	1,499	8.9	A	3,035	17.9	B	2,848	16.8	B
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	582	14.5	B	880	21.6	C	562	19.6	B
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	819	14.0	B	917	21.8	C	728	20.9	C
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	1,761	10.4	A	3,072	18.2	B	3,014	17.8	B
14	Cypress Ave On Ramp SB	D	Merge	1	374	17.5	B	853	20.6	C	335	19.2	C

Notes:
Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

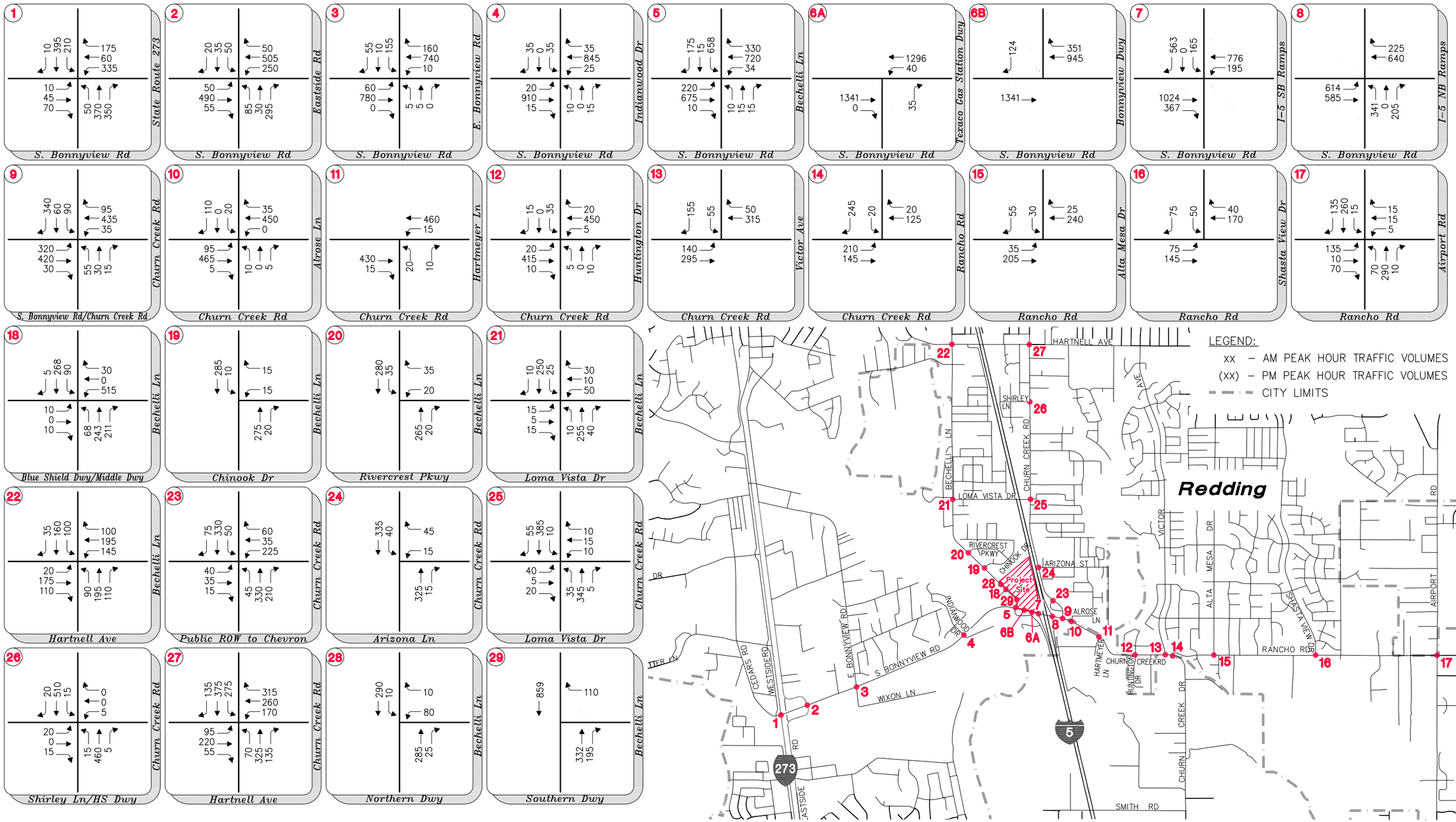
As presented in Table 24, all study ramps and freeway segments are projected to operate at or above the threshold LOS.



River Crossing Marketplace Specific Plan TIAR

Figure 11A

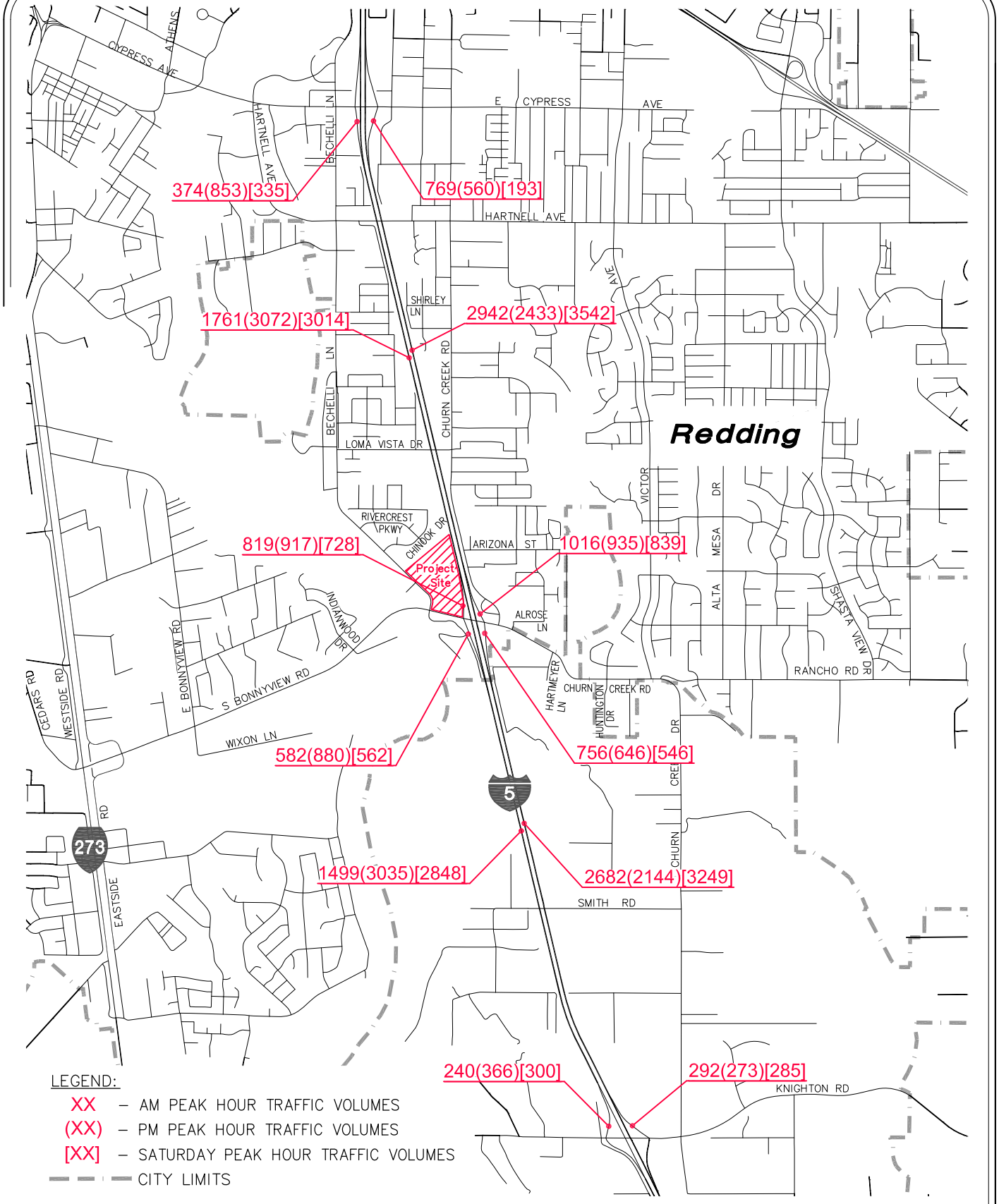
Year 2020 Plus Project Weekday AM and PM Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR

Figure 11B

Year 2020 Plus Project Saturday Mid-Day Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR Figure 12

Year 2020 Plus Project Ramp and Freeway Mainline Traffic Volumes

6/21/2017 4:43 PM K:\PRJ\2226\T2226\T2226TG001 CAD 2009.DWG

Cumulative (Year 2040) Conditions

Cumulative conditions refer to an analysis scenario approximately 23 years in the future. *Year 2040 No Project* conditions refer to the cumulative "No Project" condition where the proposed project remains undeveloped through the Year 2040, and Year 2040 model land uses are assumed elsewhere. *Year 2040 Plus Project* conditions refers to the analysis scenario in which traffic impact associated with the project are investigated in comparison to the *Year 2040 No Project* conditions.

Roadway Improvements

The Cumulative (Year 2040) lane geometrics and controls are assumed to remain consistent with Existing conditions except for the intersection of S Bonnyview Road/I-5 NB Ramps and S Bonnyview Road/I-5 SB Ramps. An additional eastbound left-turn lane will be completed at the intersection of S Bonnyview Road/I-5 NB Ramps and an additional eastbound thru lane will be constructed at the intersection of S Bonnyview Road/I-5 SB Ramps.

Shastina Ranch is an approved project that will require the extension of Shasta View Drive from Rancho Road to Airport Road. Therefore, the Shasta View Drive extension is represented in the *Year 2040* conditions.

Year 2040 No Project Conditions

The *Year 2040 No Project* conditions refer to the analysis scenario in which future operations at study locations, assuming no project development, are analyzed.

Figure 13A presents the weekday AM and PM peak hour traffic volumes for the Year 2040 No Project conditions. Figure 13B presents the *Year 2040 No Project* mid-day Saturday traffic volumes. Figure 14 presents the *Year 2040 No Project* freeway and ramp volumes.

Intersection Operations

Table 25 presents a summary of the *Year 2040 No Project* study intersection LOS conditions.

TABLE 25
YEAR 2040 NO PROJECT INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	38.6	D	-	38.8	D	-	28.9	C	-
2	S Bonnyview Rd/ Eastside Rd	Signal	D	36.8	D	-	48.8	D	-	24.8	C	-
3	S Bonnyview Rd/ E Bonnyview Rd	Signal	D	33.9	C	-	41.9	D	-	17.3	B	-
4	S Bonnyview Rd/ Indianwood Dr	Signal	D	6.8	A	-	9.5	A	-	7.7	A	-
5	S Bonnyview Rd/ Bechelli Ln	Signal	D	23.3	C	-	27.3	C	-	16.1	B	-
6A	S Bonnyview Rd/ Texaco Dwy	TWSC	D	17.9	C	-	24.6	C	-	14.2	B	-
7	S Bonnyview Rd/ I-5 SB Ramps	Signal	D	43.9	D	-	41.8	D	-	18.3	B	-
8	S Bonnyview Rd/ I-5 NB Ramps	Signal	D	46.0	D	-	29.6	C	-	25.1	C	-
9	S Bonnyview Rd/ Churn Creek Rd	Signal	D	35.9	D	-	33.5	C	-	28.9	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	14.1	B	-	23.9	C	-	14.8	B	-
11	**Churn Creek Rd/ Hartmeyer Ln**	**TWSC**	**E**	**52.3**	**F**	**No**	**81.7**	**F**	**Yes**	19.8	C	-
12	**Churn Creek Rd/ Huntington Dr**	**TWSC**	**D**	**39.3**	**E**	**No**	32.9	D	-	**36.0**	**E**	**No**
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**60.7**	**F**	**Yes**	**OVR**	**F**	**Yes**	32.8	D	-
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**36.0**	**E**	**Yes**	**52.6**	**F**	**Yes**	13.5	B	-
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	17.1	C	-	14.6	B	-	12.2	B	-
16	**Rancho Rd/ Shasta View Dr**	**TWSC**	**C**	**114.8**	**F**	**No**	**63.0**	**F**	**No**	19.1	C	-
17	**Rancho Rd/ Airport Rd**	**Signal**	**C**	**37.5**	**D**	**-**	23.6	C	-	17.7	B	-
18	Bechelli Ln/ Blue Shield Dwy	Signal	C	7.5	A	-	6.4	A	-	4.7	A	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	13.6	B	-	15.8	C	-	12.4	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	15.6	C	-	15.1	C	-	11.4	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**80.1**	**F**	**No**	**OVR**	**F**	**Yes**	19.8	C	-
22	Bechelli Ln/ Hartnell Ave	Signal	C	34.9	C	-	34.8	C	-	24.3	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	16.6	B	-	20.5	C	-	19.4	B	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	13.9	B	-	13.2	B	-	11.7	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	21.3	C	-	17.2	B	-	14.7	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	34.1	C	-	14.3	B	-	11.0	B	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**56.8**	**E**	**-**	**58.5**	**E**	**-**	33.1	C	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*
5. OVR = Delay exceeds 300 seconds

As presented in Table 25, all study intersections, except the intersections listed below, are projected to operate at or above the target LOS:

- Intersection 11 - Churn Creek Road & Hartmeyer Lane
- Intersection 12 - Churn Creek Road & Huntington Drive
- Intersection 13 - Churn Creek Road & Victor Avenue
- Intersection 14 - Churn Creek Road & Rancho Road
- Intersection 16 - Rancho Road & Shasta View Drive
- Intersection 17 - Rancho Road & Airport Road
- Intersection 21 - Bechelli Lane & Loma Vista Drive
- Intersection 27 - Churn Creek Road & Hartnell Avenue

Roadway Segment Operations

Table 26 presents a summary of the *Year 2040 No Project* roadway segment operations.

TABLE 26
YEAR 2040 NO PROJECT ROADWAY OPERATIONS

#	Roadway Segment	Capacity Configuration	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	20.2	D	18.9	D	24.5	C
2	**Churn Creek Rd between S. Bonnyview Rd & Rancho Rd**	**Undivided Arterial**	**D**	**690**	**F**	**730**	**F**	470	C
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	438	B	396	A	280	A
4	**Bechelli Ln between S. Bonnyview Rd & Chinook Dr**	**Undivided Arterial**	**C**	**582**	**D**	491	C	342	A
5	**Bechelli Ln between Chinook Dr & 3rd St**	**Divided Arterial**	**C**	542	B	**740**	**E**	365	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	405	A	429	A	~~346~~ 288	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	215	A	250	A	200	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

4. ***Bold*** *= Unacceptable Conditions*

As presented in Table 26, all study roadway segments, except the segments listed below, are projected to operate at or above the target LOS:

- Segment 2 - Churn Creek Road between S. Bonnyview Road and Victor Avenue
- Segment 4 - Bechelli Lane between S. Bonnyview Road and Chinook Drive
- Segment 5 - Bechelli Lane between Chinook Drive and 3rd Street

Intersection Queues

Tables 27A to 27B present a summary of the *Year 2040 No Project* queues projected for critical intersections along S. Bonnyview Road, Bechelli Lane and Churn Creek Road corridors.

TABLE 27A
YEAR 2040 NO PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 No Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***					
	Eastbound Left	Signal	***256***	174	169	200
	Eastbound Thru		221	236	122	
	Eastbound Thru/Right		208	295	123	
	Westbound Left/U-Turn		90	95	43	140
	Westbound Thru		245	274	141	
	Westbound Right		136	83	64	
	Northbound Thru/Left		91	95	51	
	Northbound Right		***68***	***73***	41	30
	Southbound Left/U-Turn		101	217	105	
	Southbound Left/Thru		113	276	118	
	Southbound Right		***120***	***227***	97	110
7	***S Bonnyview Rd & I-5 SB Ramps***					
	Eastbound Thru	Signal	192	230	160	250
	Eastbound Right		131	***259***	93	250
	Westbound Left		236	324	242	
	Westbound Thru		151	131	92	
	Southbound Left/Thru		***492***	***389***	139	175
	Southbound Right		506	470	171	
8	***S Bonnyview Rd & I-5 NB Ramps***					
	Eastbound Left	Signal	241	340	229	
	Eastbound Thru		226	350	127	
	Westbound Thru		279	268	191	
	Westbound Right		***252***	***214***	***118***	110
	Northbound Thru/Left		699	313	193	
	Northbound Right		***645***	270	109	285
9	***S Bonnyview Rd & Churn Creek***					
	Eastbound Left	Signal	***253***	***271***	***222***	130
	Eastbound Thru		277	317	207	
	Eastbound Right		109	***170***	18	115
	Westbound Left		***125***	***126***	52	75
	Westbound Thru		311	414	149	
	Westbound Thru/Right		451	495	207	
	Northbound Left/Thru		182	179	90	
	Northbound Right		70	45	28	
	Southbound Thru/Left		236	327	227	
	Southbound Right		288	537	175	

TABLE 27B
YEAR 2040 NO PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 No Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***					
	Eastbound Left/Thru/Right	Signal	197	347	183	
	Westbound Left/Thru		206	154	-	
	Westbound Thru/Right		349	248	7	
	Northbound Left/Thru/Right		-	52	44	
	Southbound Left		90	104	37	
	Southbound Right		177	152	62	
22	***Bechelli Ln & Hartnell Ave***					
	Eastbound Left	Signal	50	81	39	140
	Eastbound Thru		125	280	128	
	Eastbound Right		45	88	41	140
	Westbound Left		***296***	***414***	***174***	150
	Westbound Thru		188	192	115	
	Westbound Right		51	45	41	155
	Northbound Left		***435***	***201***	***116***	50
	Northbound Thru		188	236	137	
	Southbound Left		***184***	***305***	***152***	50
	Southbound Thru		153	224	105	
25	***Churn Creek Rd & Loma Vista Dr***					
	Eastbound Left/Thru/Right	Signal	237	155	2	
	Westbound Left/Thru/Right		73	59	62	
	Northbound Left		***135***	***70***	59	60
	Northbound Thru		232	213	167	
	Southbound Left		38	41	22	75
	Southbound Thru		190	361	205	
27	***Churn Creek Rd & Hartnell Ave***					
	Eastbound Left	Signal	101	***135***	81	110
	Eastbound Thru		159	285	133	
	Eastbound Right		***78***	***132***	43	75
	Westbound Left		***331***	***330***	***226***	75
	Westbound Thru		238	193	121	
	Westbound Right		99	65	66	205
	Northbound Left		***558***	***252***	***150***	115
	Northbound Thru		683	504	302	
	Southbound Left		***184***	***632***	***437***	110
	Southbound Thru		321	475	290	

Note: ***Bold*** text indicates queues that exceed available storage

Freeway and Ramp Operations

Table 28 presents a summary of the *Year 2040 No Project* ramp merge, diverge, and freeway mainline operations.

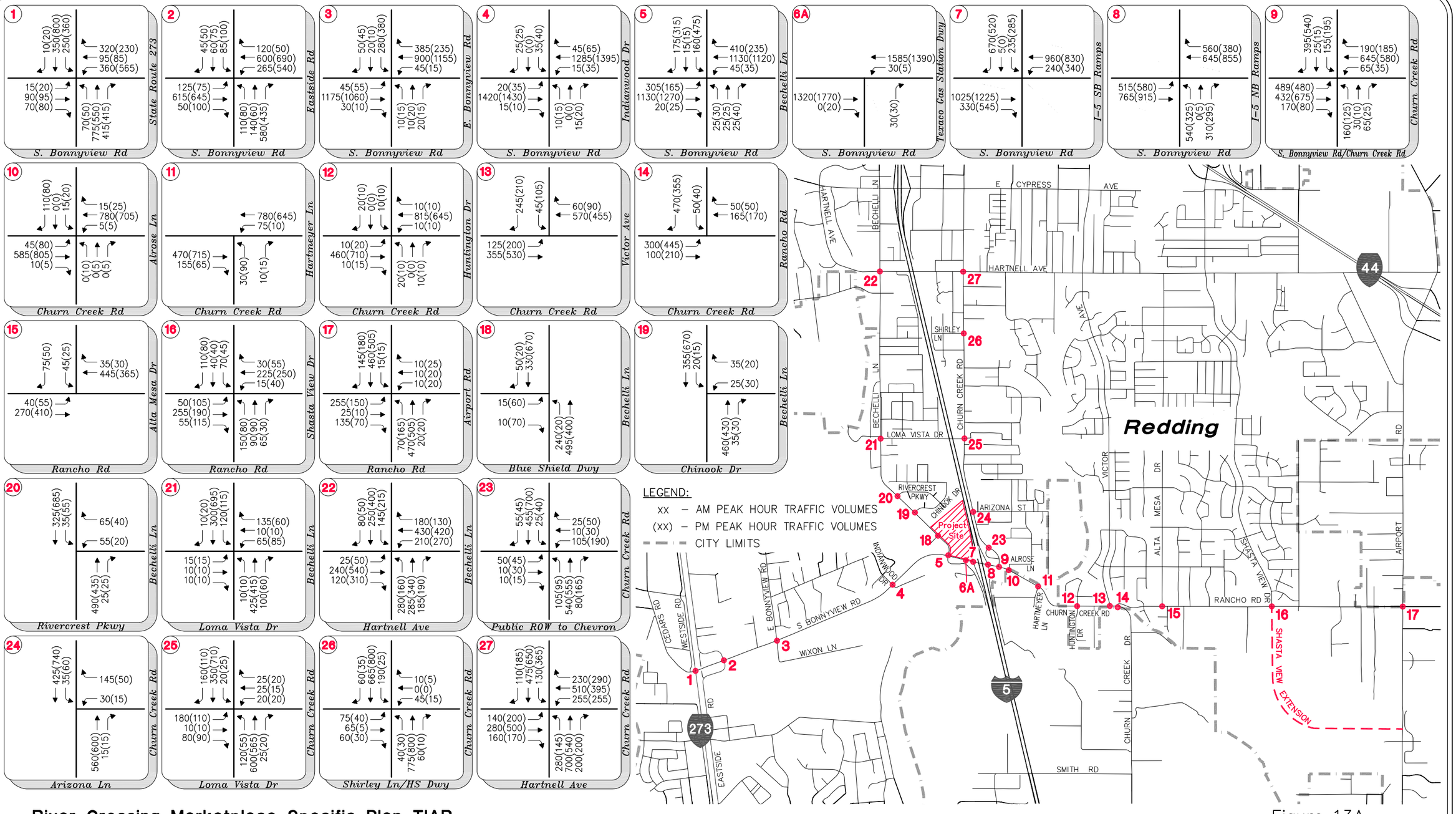
TABLE 28
YEAR 2040 NO PROJECT RAMP AND FREEWAY OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	960	27.5	D	725	22.2	C	229	24.0	C
2	S. Bonnyview Rd to Cypress Ave NB	D	Mainline	3	3,825	22.6	C	2,957	17.5	B	3,457	20.4	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	995	25.4	C	965	20.1	C	750	22.1	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	850	24.8	C	625	18.2	B	460	21.0	C
5	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	3	3,680	21.7	C	2,617	15.5	B	3,167	18.7	B
6	**Knighton Rd to S. Bonnyview Rd NB**	**D**	**Mainline**	**2**	**3,680**	**36.8**	**E**	2,617	23.3	C	3,167	29.2	D
7	**Knighton Rd On Ramp NB**	**D**	**Merge**	**1**	**261**	**35.6**	**E**	315	25.9	C	324	30.8	D
8	**Knighton Rd Off Ramp SB**	**D**	**Diverge**	**1**	224	22.2	C	**375**	**38.2**	**E**	302	34.9	D
9	**S. Bonnyview Rd to Knighton Rd SB**	**D**	**Mainline**	**2**	2,188	19.4	C	**3,802**	**39.0**	**E**	3,466	33.3	D
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	2,188	12.9	B	3,802	22.5	C	3,466	20.5	C
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	575	16.9	B	885	25.7	C	450	22.6	C
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	910	18.9	B	805	25.0	C	550	23.6	C
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	2,523	14.9	B	3,722	22.0	C	3,566	21.1	C
14	Cypress Ave On Ramp SB	D	Merge	1	425	16.8	B	1,000	24.3	C	379	22.1	C

Notes:
Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

As presented in Table 28, all study freeway segments and ramps, except the following, are projected to operate at or above the target LOS:

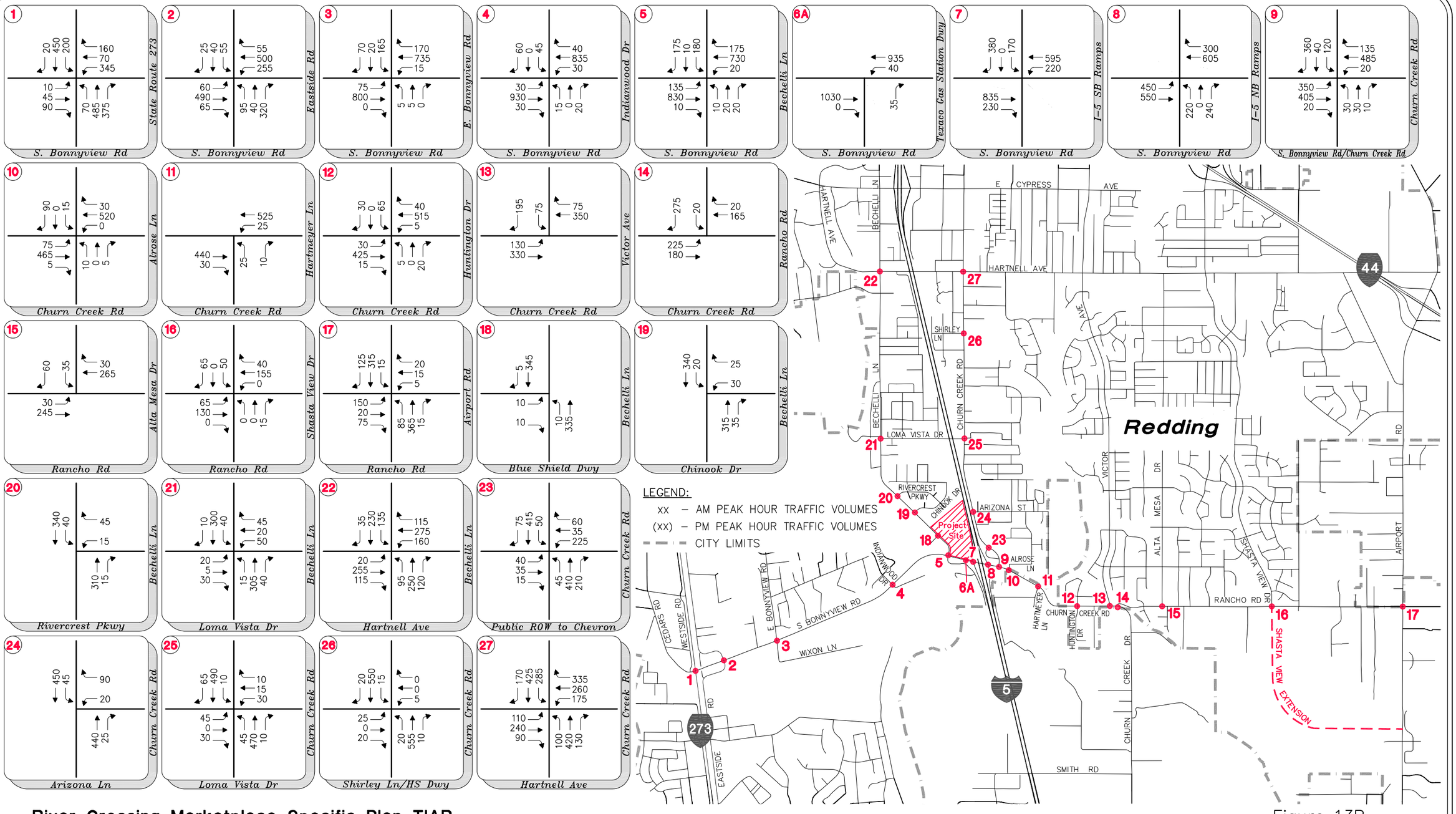
- Knighton Road to S. Bonnyview Road NB - Mainline (4-lane section)
- Knighton Road On Ramp NB - Merge
- Knighton Road Off Ramp SB - Diverge
- S. Bonnyview Road to Knighton Road SB - Mainline (4-lane section)



River Crossing Marketplace Specific Plan TIAR

Figure 13A

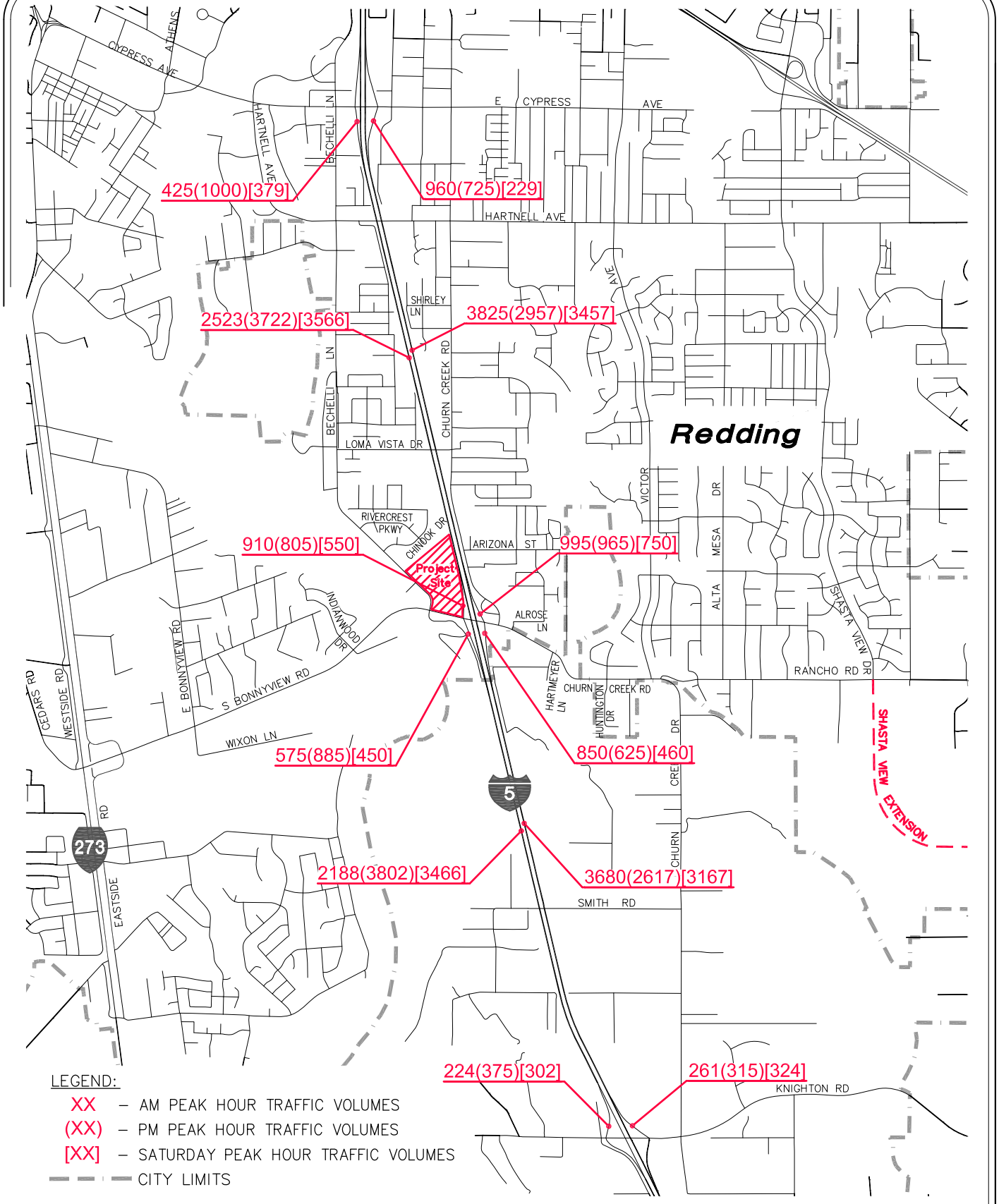
Year 2040 No Project Weekday AM and PM Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR

Figure 13B

Year 2040 No Project Saturday Mid-Day Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR Figure 14

Year 2040 No Project Ramp and Freeway Mainline Traffic Volumes

6/13/2017 8:40 AM K:\PRJ\2226\T2226\T2226TG001 CAD 2009.DWG

Year 2040 Plus Project Conditions

Year 2040 Plus Project conditions were simulated by superimposing traffic generated by the full build-out of the proposed project onto *Year 2040 No Project* traffic volumes.

Figure 15A presents the weekday AM and PM peak hour traffic volumes for the *Year 2040 Plus Project* conditions. Figure 15B presents the *Year 2040 Plus Project* Saturday mid-day traffic volumes. Figure 16 presents the *Year 2040 Plus Project* freeway and ramp volumes.

Intersection Operations

Table 29 presents a summary of the Year 2040 Plus Project study intersection LOS conditions.

TABLE 29
YEAR 2040 PLUS PROJECT INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	39.9	D	-	39.3	D	-	29.4	C	-
2	S. Bonnyview Rd/ Eastside Rd	Signal	D	39.1	D	-	50.9	D	-	25.7	C	-
3	S. Bonnyview Rd/ E. Bonnyview Rd	Signal	D	40.9	D	-	45.7	D	-	17.8	B	-
4	S. Bonnyview Rd/ Indianwood Dr	Signal	D	7.0	A	-	10.2	B	-	7.9	A	-
5	**S. Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**58.6**	**E**	**-**	**76.3**	**E**	**-**	31.6	C	-
6A	**S. Bonnyview Rd/ Texaco Dwy**	**TWSC**	**D**	20.5	C	-	**35.8**	**E**	**No**	19.4	C	-
6B	S. Bonnyview Rd/ S. Bonnyview Dwy	TWSC	D	32.2	D	-	28.8	D	-	25.9	D	-
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**83.5**	**F**	**-**	**114.7**	**F**	**-**	32.7	C	-
8	**S. Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**59.2**	**E**	**-**	40.9	D	-	27.9	C	-
9	S. Bonnyview Rd/ Churn Creek Rd	Signal	D	36.7	D	-	33.7	C	-	28.6	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	14.5	B	-	25.7	D	-	15.9	C	-
11	**Churn Creek Rd/ Hartmeyer Ln**	**TWSC**	**E**	**61.6**	**F**	**No**	**107.3**	**F**	**Yes**	23.2	C	-
12	**Churn Creek Rd/ Huntington Dr**	**TWSC**	**D**	**45.8**	**E**	**No**	**37.1**	**E**	**No**	**52.1**	**F**	**No**
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**84.5**	**F**	**Yes**	**OVR**	**F**	**Yes**	**54.2**	**F**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**45.7**	**E**	**Yes**	**72.2**	**F**	**Yes**	14.9	B	-
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	18.1	C	-	15.1	C	-	12.9	B	-
16	**Rancho Rd/ Shasta View Dr**	**TWSC**	**C**	**143.6**	**F**	**No**	**89.6**	**F**	**No**	22.0	C	-
17	**Rancho Rd/ Airport Rd**	**Signal**	**C**	**41.0**	**D**	-	26.4	C	-	18.2	B	-
18	Blue Shield Dwy/ Middle Dwy	Signal	C	19.7	B	-	24.8	C	-	22.3	C	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	14.0	B	-	16.2	C	-	12.9	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	16.3	C	-	15.9	C	-	12.1	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**116.9**	**F**	**Yes**	**OVR**	**F**	**Yes**	24.0	C	-
22	Bechelli Ln/ Hartnell Ave	Signal	C	34.7	C	-	34.9	C	-	24.4	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	18.3	B	-	24.1	C	-	24.4	C	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	14.1	B	-	13.4	B	-	12.0	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	21.6	C	-	17.5	B	-	15.4	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	34.6	C	-	14.5	B	-	11.2	B	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**59.7**	**E**	**-**	**60.4**	**E**	**-**	34.1	C	-
28	**Bechelli Ln/ Northern Dwy**	**TWSC**	**C**	20.2	C	-	**36.5**	**E**	**-**	24.7	C	-
29	Bechelli Ln/ Southern Dwy	TWSC	C	~~13.4~~ **35.5**	~~B~~ **E**	-	~~11.8~~ **48.9**	~~B~~ **E**	-	~~12.0~~ **30.0**	~~B~~ **D**	-

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*
5. OVR = Delay exceeds 300 seconds

As presented in Table 29, all study intersections, except the intersections listed below, are projected to operate at or above the target LOS:

- Intersection 5 - S. Bonnyview Road & Bechelli Lane
- Intersection 6A - S. Bonnyview Road & Texaco Driveway
- Intersection 7 - S. Bonnyview Road & I-5 SB Ramps
- Intersection 8 - S. Bonnyview Road & I-5 NB Ramps
- Intersection 11 - Churn Creek Road & Hartmeyer Lane

- Intersection 12 - Churn Creek Road & Huntington Drive
- Intersection 13 - Churn Creek Road & Victor Avenue
- Intersection 14 - Churn Creek Road & Rancho Road
- Intersection 16 - Rancho Road & Shasta View Drive
- Intersection 17 - Rancho Road & Airport Road
- Intersection 21 - Bechelli Lane & Loma Vista Drive
- Intersection 27 - Churn Creek Road & Hartnell Avenue
- Intersection 28 - Bechelli Lane & Northern Driveway
- Intersection 29 – Bechelli Lane & Southern Driveway

Additional details on the delays at Intersection 29 are included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Roadway Segment Operations

Table 30 presents a summary of the Year 2040 Plus Project roadway segment operations.

TABLE 30
YEAR 2040 PLUS PROJECT ROADWAY OPERATIONS

#	Roadway Segment	Capacity Configuration	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	**S. Bonnyview Rd between SR 273 & Churn Creek Rd**	**Divided Arterial**	**D**	**14.2**	**E**	**16.3**	**E**	22.4	C
2	**Churn Creek Rd between S. Bonnyview Rd & Rancho Rd**	**Undivided Arterial**	**D**	**722**	**F**	**766**	**F**	522	C
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	~~381~~ 458	~~A~~ B	416	B	313	A
4	**Bechelli Ln between S. Bonnyview Rd & Chinook Dr**	**Undivided Arterial**	**C**	485	C	**672**	**E**	460	B
5	**Bechelli Ln between Chinook Dr & 3rd St**	**Divided Arterial**	**C**	558	B	**760**	**E**	403	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	413	A	438	A	304	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	218	A	253	A	205	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

4. ***Bold*** *= Unacceptable Conditions*

As presented in Table 30, all study roadway segments, except the segments listed below, are projected to operate at or above the target LOS:

- Segment 1 - S. Bonnyview Road between SR 273 and Churn Creek Road
- Segment 2 - Churn Creek Road between S. Bonnyview Road and Victor Avenue
- Segment 4 - Bechelli Lane between S. Bonnyview Road and Chinook Drive
- Segment 5 - Bechelli Lane between Chinook Drive and 3rd Street

Intersection Queues

Tables 31A and 31B present a summary of the *Year 2040 Plus Project* queues projected for critical intersections along the S. Bonnyview Road, Bechelli Lane and Churn Creek Road corridors.

TABLE 31A
YEAR 2040 PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 No Project 95th Percentile Queue (ft)			Yr 2040 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***								
	Eastbound Left	Signal	***256***	174	169	***314***	***231***	***233***	200
	Eastbound Thru		221	236	122	322	343	209	
	Eastbound Thru/Right		208	295	123	316	386	197	
	Westbound Left/U-Turn		90	95	43	121	***173***	76	140
	Westbound Thru		245	274	141	285	332	216	
	Westbound Right		136	83	64	190	167	143	
	Northbound Thru/Left		91	95	51	93	95	57	
	Northbound Right		***68***	***73***	***41***	***68***	***74***	***51***	30
	Southbound Left		101	217	105	233	302	402	
	Southbound Left/Thru		113	276	118	189	320	426	
	Southbound Right		***120***	***227***	97	***159***	***234***	***264***	110
7	***S Bonnyview Rd & I-5 SB Ramps***								
	Eastbound Thru	Signal	192	230	160	235	230	243	250
	Eastbound Right		131	***259***	93	145	***291***	180	250
	Westbound Left		236	324	242	236	324	242	
	Westbound Thru		151	131	92	153	158	170	
	Southbound Left/Thru		***492***	***389***	139	***492***	***401***	***520***	175
	Southbound Right		506	470	171	506	486	586	
8	***S Bonnyview Rd & I-5 NB Ramps***								
	Eastbound Left	Signal	241	340	229	301	340	374	
	Eastbound Thru		226	350	127	382	350	209	
	Westbound Thru		279	268	191	300	280	238	
	Westbound Right		***252***	***214***	***118***	***255***	***260***	***187***	110
	Northbound Thru/Left		699	313	193	699	639	367	
	Northbound Right		***645***	270	109	***645***	***558***	162	285
9	***S Bonnyview Rd & Churn Creek Rd***								
	Eastbound Left	Signal	***253***	***271***	***222***	***277***	***271***	***238***	130
	Eastbound Thru		277	317	207	319	317	283	
	Eastbound Right		109	***170***	18	114	***170***	32	115
	Westbound Left		***125***	***126***	52	***125***	***126***	63	75
	Westbound Thru		311	414	149	409	504	157	
	Westbound Thru/Right		451	495	207	493	499	276	
	Northbound Left/Thru		182	179	90	182	179	92	
	Northbound Right		70	45	28	74	45	28	
	Southbound Thru/Left		236	327	227	236	365	231	
	Southbound Right		288	537	175	386	645	208	

TABLE 31B
YEAR 2040 PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 No Project 95th Percentile Queue (ft)			Yr 2040 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***								
	Eastbound Left/Thru/Right	Signal	197	347	183	197	389	201	
	Westbound Left/Thru		206	154	-	422	864	-	
	Westbound Thru/Right		349	248	7	492	852	10	
	Northbound Left/Thru/Right		-	52	44	-	138	45	
	Southbound Left		90	104	37	100	104	41	
	Southbound Right		177	152	62	191	174	67	
22	***Bechelli Ln & Hartnell Ave***								
	Eastbound Left	Signal	50	81	39	50	81	39	140
	Eastbound Thru		125	280	128	125	280	128	
	Eastbound Right		45	88	41	51	88	50	140
	Westbound Left		***296***	***414***	***174***	***296***	***414***	***174***	150
	Westbound Thru		188	192	115	188	192	115	
	Westbound Right		51	45	41	51	45	41	155
	Northbound Left		***435***	***201***	***116***	***444***	***208***	***126***	50
	Northbound Thru		188	236	137	188	236	137	
	Southbound Left		***184***	***305***	***152***	***184***	***305***	***152***	50
	Southbound Thru		153	224	105	153	224	107	
25	***Churn Creek Rd & Loma Vista Dr***								
	Eastbound Left/Thru/Right	Signal	237	155	2	242	162	62	
	Westbound Left/Thru/Right		73	59	62	77	62	68	
	Northbound Left		***135***	***70***	59	***136***	***71***	60	60
	Northbound Thru		232	213	167	241	221	181	
	Southbound Left		38	41	22	38	41	23	75
	Southbound Thru		190	361	205	202	378	222	
27	***Churn Creek Rd & Hartnell Ave***								
	Eastbound Left	Signal	101	***135***	81	101	***135***	82	110
	Eastbound Thru		159	285	133	159	285	135	
	Eastbound Right		***78***	***132***	43	***78***	***132***	44	75
	Westbound Left		***331***	***330***	***226***	***362***	***360***	***245***	75
	Westbound Thru		238	193	121	238	193	122	
	Westbound Right		99	65	66	99	65	66	205
	Northbound Left		***558***	***252***	***150***	***558***	***252***	***152***	115
	Northbound Thru		683	504	302	700	522	325	
	Southbound Left		***184***	***632***	***437***	***184***	***632***	***447***	110
	Southbound Thru		321	475	290	326	500	306	

Note: ***Bold*** text indicates queues that exceed available storage

On-Site Driveway Queues

Table 32 presents the 95th percentile queues for proposed driveways for the *Year 2040 Plus Project* conditions.

TABLE 32
YEAR 2040 PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS FOR DRIVEWAYS

Int. #	Intersection/Approach	Control Type	Year 2040 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
6B	***S. Bonnyview Rd & S. Bonnyview Dwy***					
	Southbound Right	TWSC	70	74	85	
18	***Bechelli Lane & Blue Shield Dwy/Middle Dwy***					
	Westbound Left	Signal	66	1035	152	
	Westbound Left/Thru		65	1015	228	
	Westbound Right		20	***97***	***76***	60
	Northbound Right		17	51	57	
	Southbound Left		53	***192***	93	125
28	***Bechelli Lane & Northern Dwy***					
	Westbound Left/Right	TWSC	53	230	72	
	Southbound Left		10	43	21	50
29	***Bechelli Lane & Southern Dwy***					
	Westbound Left	TWSC	133	170	125	
	Westbound Right	TWSC	77	58	58	

Note: ***Bold*** text indicates queues that exceed available storage

As shown in Table 32, the 95th percentile queuing is presented for project driveways for current roadway conditions without any intersection and/or roadway improvements. The 95th percentile onsite queuing is projected to be approximately 42 vehicles for the westbound left/thru lane at the intersection of Bechelli Lane & Blue Shield Driveway/Middle Driveway for the PM peak hour (based on an average length of 25 feet per vehicle). This queuing is due to the queue spillback from the Bechelli Lane/Bonnyview Road intersection. Table 37B presents the mitigated queues while the potential mitigations are provided in a later section of the report.

Additional Queue data for the westbound left turn for Intersection 29 is included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Freeway and Ramp Operations

Table 33 presents a summary of the *Year 2040 Plus Project* ramp merge, diverge, and freeway mainline operations.

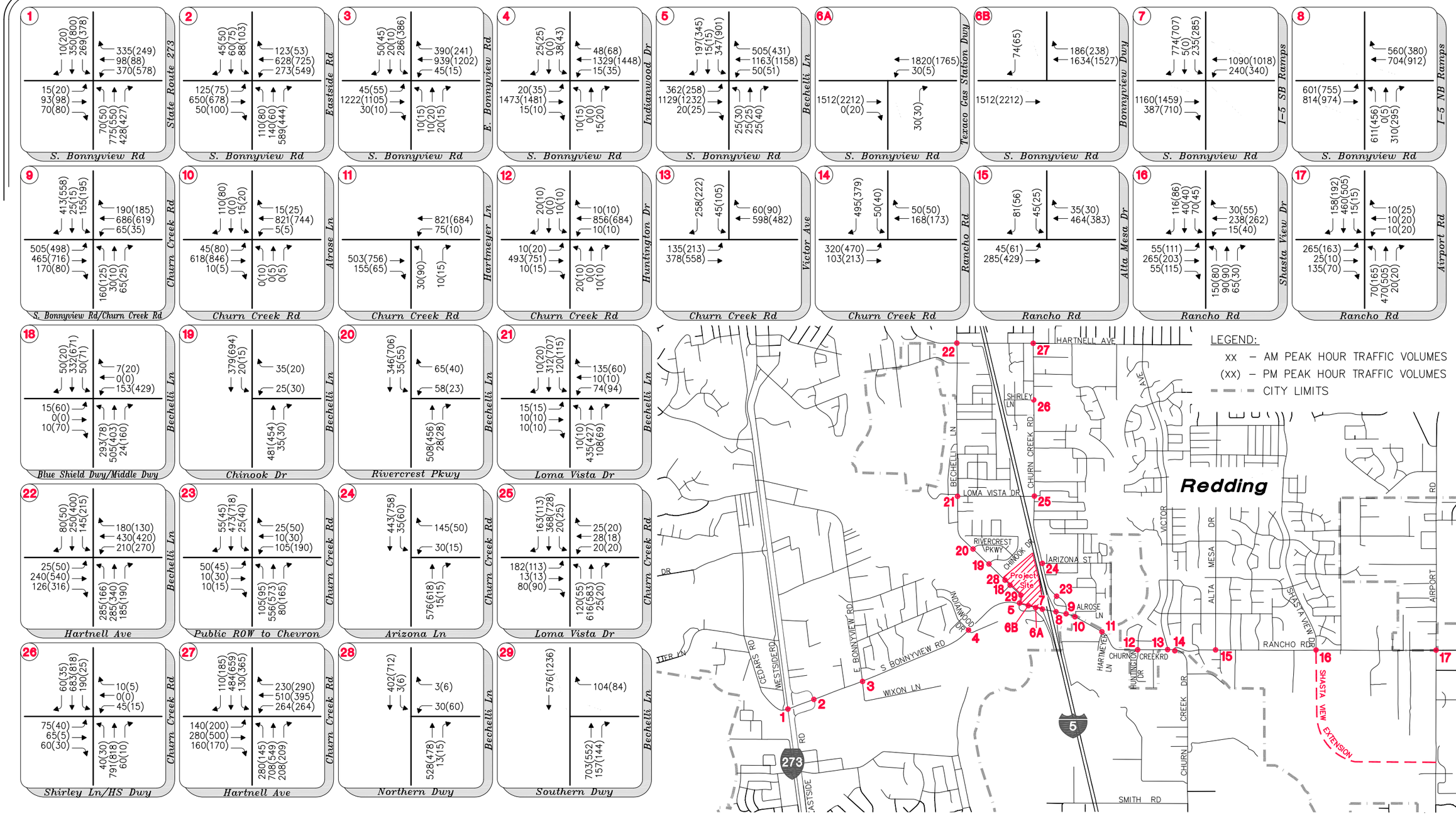
TABLE 33
YEAR 2040 PLUS PROJECT RAMP AND FREEWAY OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour Volume	AM Peak Hour Density (pc/mi/ln)	AM Peak Hour LOS	PM Peak Hour Volume	PM Peak Hour Density (pc/mi/ln)	PM Peak Hour LOS	Saturday Peak Hour Volume	Saturday Peak Hour Density (pc/mi/ln)	Saturday Peak Hour LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	970	28.0	C	738	22.8	C	249	25.0	C
2	Bonnyview Rd to Cypress Ave NB	D	Mainline	3	3,909	23.1	C	3,061	18.1	B	3,622	21.4	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	1,081	26.1	C	1,140	21.1	C	984	23.5	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	921	25.3	C	756	18.8	B	636	22.0	C
5	Knighton Rd to Bonnyview Rd NB	D	Mainline	3	3,749	22.2	C	2,677	15.8	B	3,274	19.3	B
6	**Knighton Rd to Bonnyview Rd NB**	**D**	**Mainline**	**2**	**3,749**	**38.0**	**E**	2,677	23.8	C	3,274	30.6	D
7	**Knighton Rd On Ramp NB**	**D**	**Merge**	**1**	**267**	**36.2**	**E**	321	26.4	D	334	31.8	D
8	**Knighton Rd Off Ramp SB**	**D**	**Diverge**	**1**	229	22.7	C	**381**	**39.0**	**E**	**312**	**36.0**	**E**
9	**S. Bonnyview Rd to Knighton Rd SB**	**D**	**Mainline**	**2**	2,244	19.9	B	**3,879**	**40.6**	**E**	**3,580**	**35.1**	**E**
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	2,244	13.3	B	3,879	23.0	C	3,580	21.2	C
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	632	17.4	B	1,050	26.5	C	637	23.7	C
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	1,014	19.8	B	992	25.9	C	788	25.0	C
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	2,626	15.5	B	3,821	22.6	C	3,731	22.1	C
14	Cypress Ave On Ramp SB	D	Merge	1	434	17.4	B	1,009	24.8	C	394	23.0	C

Notes:
Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

As presented in Table 33, all study freeway segments and ramps, except the following, are projected to operate at or above the threshold LOS:

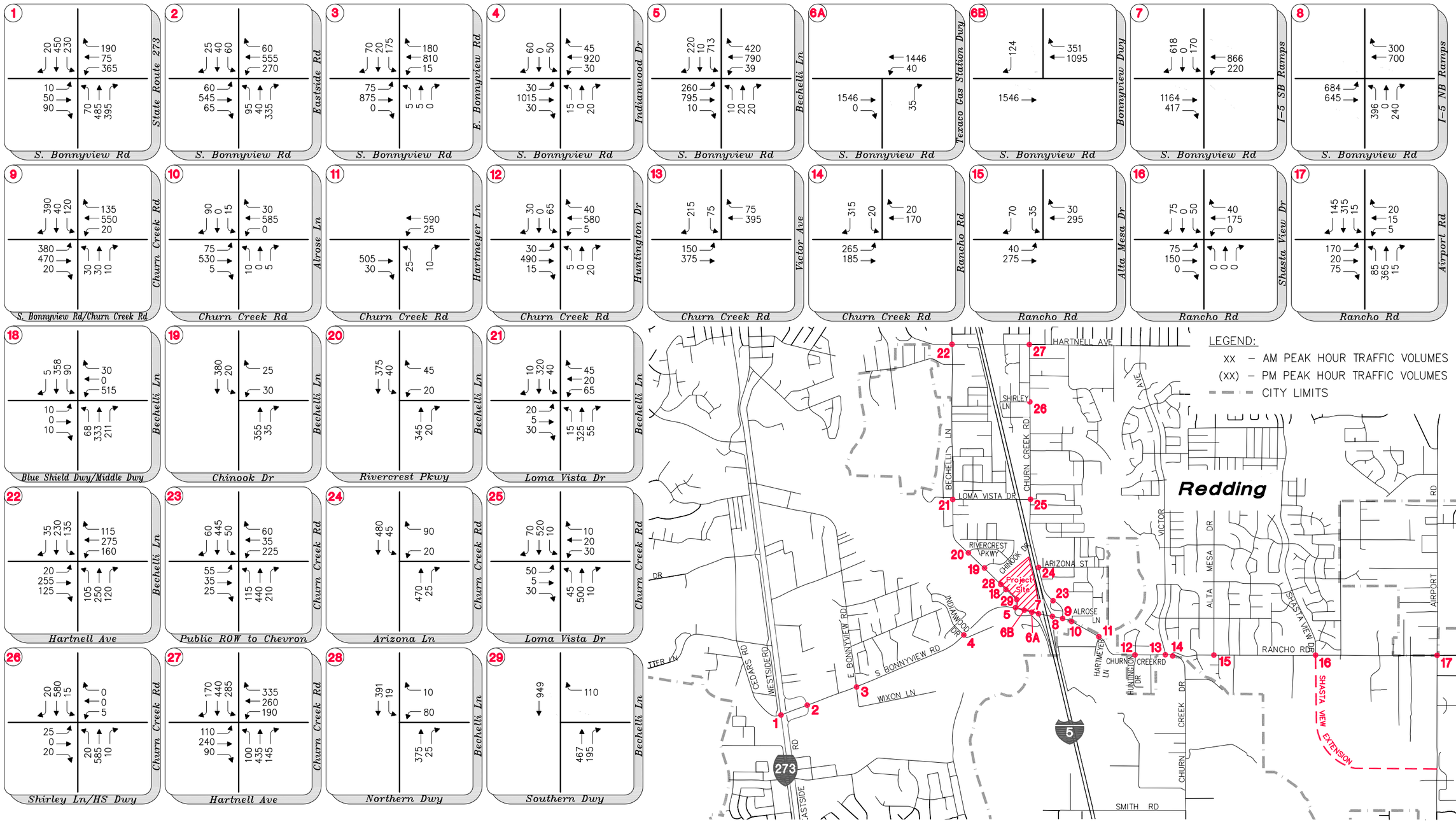
- Knighton Road to Bonnyview Road NB - Mainline (4-lane section)
- Knighton Road On ramp NB - Merge
- Knighton Road Off Ramp SB - Diverge
- S Bonnyview Road to Knighton Road SB - Mainline (4-lane section)



River Crossing Marketplace Specific Plan TIAR

Figure 15A

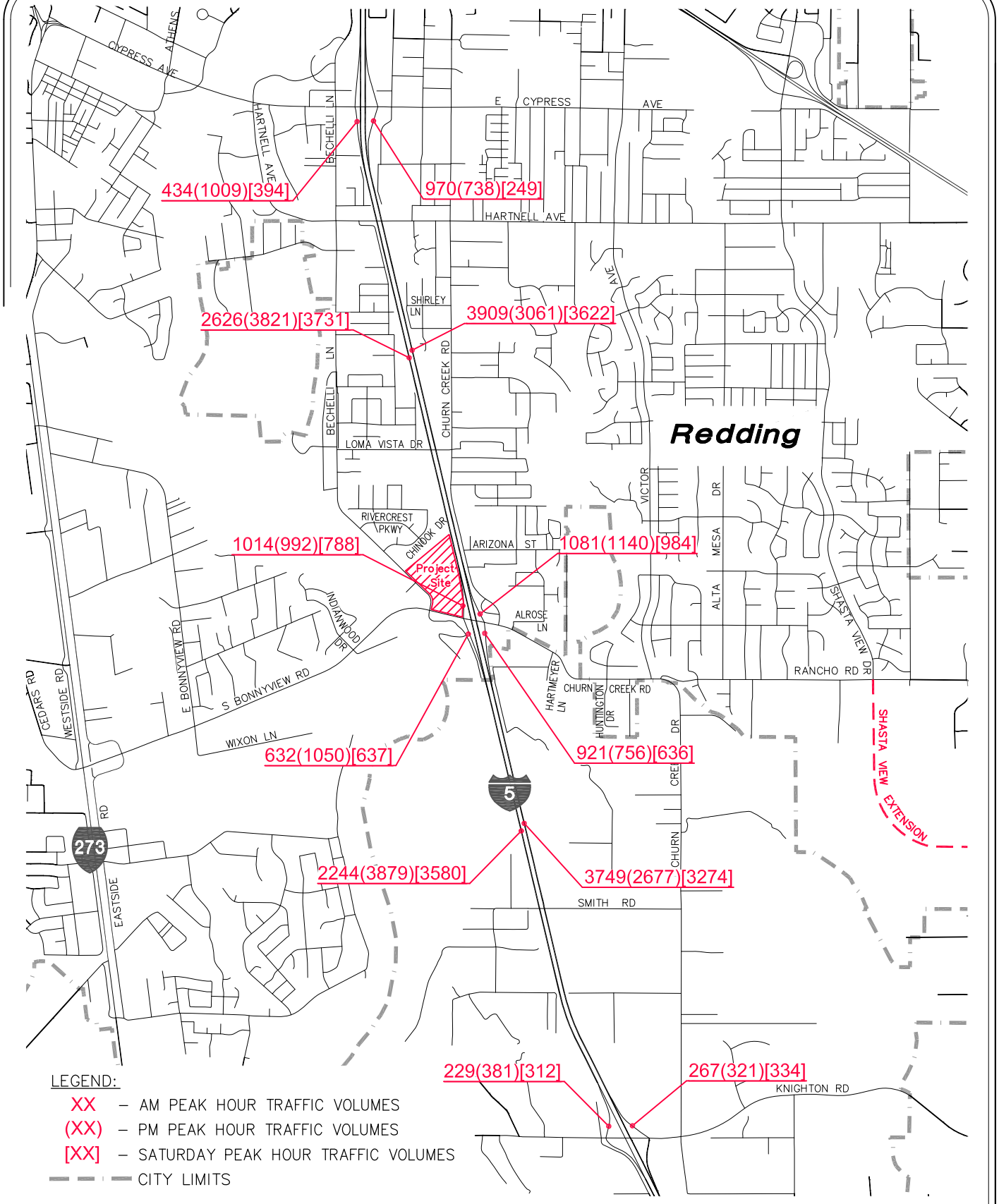
Year 2040 Plus Project Weekday AM and PM Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR

Figure 15B

Year 2040 Plus Project Saturday Mid-Day Peak Hour Traffic Volumes



River Crossing Marketplace Specific Plan TIAR Figure 16

Year 2040 Plus Project Ramp and Freeway Mainline Traffic Volumes

6/21/2017 4:44 PM K:\PRJ\2226\T2226\T2226TG001 CAD 2009.DWG

Project Impacts and Mitigation Measures

This section presents recommended project-related mitigation measures at the study intersections. These mitigation measures were developed based on the findings from the analyses presented in the prior sections of this report. The mitigations are provided for both *Existing* conditions, *Year 2020* conditions and *Year 2040* conditions separately, so it may be possible that the same mitigations at one location are applicable for all conditions.

Comparison tables of the mitigated and un-mitigated LOS are included in Appendix A.

Impact Significance Criteria

In accordance with the January 2009 City of Redding TIA Guidelines, the following thresholds of significance are used to determine if the proposed project causes a significant impact and requires mitigation:

Signalized Intersections

- The project causes an acceptable LOS to decline to an unacceptable LOS, or
- The project increases the overall average delay by more than 5 seconds per vehicle at an intersection having an unacceptable LOS without project traffic

Two-Way Stop Intersections

- The project causes the following to occur for the worst-case movement:
  - The LOS declines to an unacceptable LOS, and
  - The volume to capacity ratio exceeds 0.75, and
  - The 95th percentile queue exceeds 75 feet (3 vehicles), or
- The project causes the worst-case movement's acceptable LOS to decline to an unacceptable LOS and the peak hour volume signal warrant is met, or
- The project increases the average delay for the worst-case movement by more than 5 seconds per vehicle at an intersection that has an unacceptable LOS without the project and the intersection also meets the peak hour volume signal warrant.

Roadways

City of Redding TIA Guidelines do not have specified significance thresholds for Roadway Segments. Therefore, consistent with past reports and industry standards the following thresholds have been established. The project is considered to have a significant impact if it would:

- Result in a roadway that will operate at an acceptable LOS in the No Project condition to deteriorate to an unacceptable LOS in the Plus Project condition; or,
- Increase the V/C ratio by more than 5% at a roadway that will operate at an unacceptable LOS in the No Project condition; or,
- Decrease the average arterial speed by more than 5% at a roadway that will operate at an unacceptable LOS in the No Project condition.

Freeway Mainline/Ramp Merge-Diverge/Weave

Caltrans TIA Guidelines do not have specified significance thresholds for Roadway Segments. Therefore, consistent with past reports and industry standards the following thresholds have been established. The project is considered to have a significant impact if it would:

- Result in a facility that will operate at an acceptable LOS in the No Project condition to deteriorate to an unacceptable LOS in the Plus Project condition; or,
- Increase the density by more than 5% at a facility that will operate at an unacceptable LOS in the No Project condition.

Existing Plus Project Impacts

Table 34 presents the intersections projected to operate at unacceptable levels of service under *Existing Plus Project* conditions and determines whether a significant impact is identified.

TABLE 34
EXISTING PLUS PROJECT SIGNIFICANT IMPACTS AT INTERSECTIONS

#	Intersection	Control Type[1]	Target LOS	Existing LOS[2]	Existing Plus Project LOS[2]	Existing Delay (D1)	Existing Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
7	**S Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**C**	**E**	**24.5**	**62.3**	**37.8**	**-**	**-**	**-**	**Yes**
8	**S Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**D**	**E**	**43.3**	**73.0**	**29.7**	**-**	**-**	**-**	**Yes**
21	Bechelli Ln/ Loma Vista Dr	TWSC	C	D	E	31.2	39.8	8.6	No	0.72	6	No
27	Churn Creek Rd/ Hartnell Ave	Signal	C	D	D	39.6	40.5	0.9	-	-	-	No

PM Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Existing LOS[2]	Existing Plus Project LOS[2]	Existing Delay (D1)	Existing Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
7	**S Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**B**	**E**	**18.6**	**74.4**	**55.8**	**-**	**-**	**-**	**Yes**
8	**S Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**C**	**E**	**27.5**	**67.5**	**40.0**	**-**	**-**	**-**	**Yes**
13	Churn Creek Rd/ Victor Ave	TWSC	D	D	E	29.2	37.3	8.1	No	0.70	5	No
21	Bechelli Ln/ Loma Vista Dr	TWSC	C	E	E	35.6	44.5	8.9	No	0.57	3	No
27	Churn Creek Rd/ Hartnell Ave	Signal	C	D	D	42.3	43.4	1.1	-	-	-	No

Notes:
1. TWSC = Two Way Stop Control, OVR = >300 Seconds Delay
2. LOS = Delay based on worst minor street movement for TWSC intersections, average delay for AWSC and Signal intersections.
3. V/C and 95% Queue not reported if not required to determine significance
*4. **Bold** = Unacceptable Conditions*

Existing Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections where a project significant impact is identified for the *Existing Plus Project* conditions.

Intersections

The following improvements are proposed to provide acceptable operations at intersections where a project significant impact is identified for the *Existing Plus Project* conditions.

Intersection 7 - S. Bonnyview Road & I-5 Southbound Ramps

This signalized intersection is projected to operate at LOS E in the weekday AM and PM peak hours. The proposed project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable for both the AM and PM peak hour scenarios. The following improvements are proposed to mitigate the project impact to less than significant:

- Widen the eastbound approach to provide:
  - Two thru lanes that transition into two trap left-turn lanes at the subsequent intersection of S. Bonnyview Road & I-5 NB Ramps.
- Widen the southbound approach to provide:
  - One shared thru/left-turn lane.
  - Two right-turn lanes (each of length 175 feet).

OR

- Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.

After the mitigations stated above, the mitigated LOS is projected to be LOS B for the signal alternative and LOS B or better for the diverging diamond interchange (based on analysis performed for Year 2020 Plus Project mitigations).

Intersection 8 - S. Bonnyview Road & I-5 Northbound Ramps

This signalized intersection is projected to operate at LOS E in the weekday AM and PM peak hours. The proposed project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable for both the AM and PM peak hour scenarios. The following improvements are proposed to mitigate the project impact to less than significant:

- Widen the eastbound approach to provide:
  - An additional eastbound left turn lane.
- Widen the northbound approaches to provide:
  - ~~One left-turn lane of length 285 feet.~~
  - One shared thru/left-turn lane of length ~~285~~ 300 feet.
  - One right-turn lane of length ~~285~~ 300 feet.

OR

- Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.

After the mitigations stated above, the mitigated LOS is projected to be LOS C for the signal alternative and LOS B or better for the diverging diamond interchange (based on analysis performed for Year 2020 Plus Project mitigations).

Year 2020 Plus Project Impacts

Table 35A presents the intersections projected to operate at unacceptable levels of service under *Year 2020 Plus Project* conditions and determines whether a significant impact is identified.

TABLE 35A
YEAR 2020 PLUS PROJECT SIGNIFICANT IMPACTS AT INTERSECTIONS

AM Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2020 LOS[2]	Year 2020 Plus Project LOS[2]	Year 2020 Delay (D1)	Year 2020 Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**C**	**C**	**20.1**	**34.9**	**14.8**	**-**	**-**	**8**	**Yes**
7	**S Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**C**	**E**	**29.6**	**63.7**	**34.1**	**-**	**-**	**-**	**Yes**
21	Bechelli Ln/ Loma Vista Dr	TWSC	C	F	F	69.5	105.3	35.8	No	1.03	11	No
27	Churn Creek Rd/ Hartnell Ave	Signal	C	D	D	43.3	44.6	1.3	-	-	-	No

PM Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2020 LOS[2]	Year 2020 Plus Project LOS[2]	Year 2020 Delay (D1)	Year 2020 Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**C**	**D**	**21.6**	**46.2**	**24.6**	**-**	**-**	**17**	**Yes**
7	**S Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**C**	**E**	**21**	**75.2**	**54.2**	**-**	**-**	**-**	**Yes**
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**F**	**F**	**53.7**	**78.7**	**25.0**	**Yes**	**0.93**	**9**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**C**	**D**	**21.8**	**25.7**	**3.9**	**Yes**	**0.70**	**6**	**Yes**
21	Bechelli Ln/ Loma Vista Dr	TWSC	C	E	F	44.8	59.1	14.3	No	0.68	4	No
27	Churn Creek Rd/ Hartnell Ave	Signal	C	D	D	47.2	48.4	1.2	-	-	-	No

Saturday Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2020 LOS[2]	Year 2020 Plus Project LOS[2]	Year 2020 Delay (D1)	Year 2020 Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**B**	**C**	**15**	**26.3**	**11.3**	**-**	**-**	**16**	**Yes**

Notes:
1. TWSC = Two Way Stop Control, OVR = >300 Seconds Delay
2. LOS = Delay based on worst minor street movement for TWSC intersections, average delay for AWSC and Signal intersections.
3. V/C and 95% Queue not reported if not required to determine significance
*4. **Bold** = Unacceptable Conditions*

Table 35B presents the roadway segments projected to operate at unacceptable levels of service under *Year 2020 Plus Project* conditions and determines whether a significant impact is identified.

TABLE 35B
YEAR 2020 PLUS PROJECT SIGNIFICANT IMPACTS AT ROADWAY SEGMENTS

AM Peak Hour									
#	Roadway Segment	Control Type[1]	Target LOS	Year 2020 LOS[2]	Year 2020 Plus Project LOS[2]	Year 2020 V/C Ratio (V/C_1)	Year 2020 Plus Project V/C Ratio (V/C_2)	Percentage Increase in V/C Ratio (V/C_1-V/C_2)	Significant Impact?
2	**Churn Creek Rd between S. Bonnyview Rd & Rancho Rd**	**Undivided Arterial**	**D**	**D**	**E**	**0.95**	**1.01**	**5.6%**	**Yes**

PM Peak Hour									
#	Roadway Segment	Control Type[1]	Target LOS	Year 2020 LOS[2]	Year 2020 Plus Project LOS[2]	Year 2020 V/C Ratio (V/C_1)	Year 2020 Plus Project V/C Ratio (V/C_2)	Percentage Increase in V/C Ratio (V/C_1-V/C_2)	Significant Impact?
2	**Churn Creek Rd between S. Bonnyview Rd & Rancho Rd**	**Undivided Arterial**	**D**	**D**	**E**	**0.963**	**1.022**	**6.1%**	**Yes**

Notes:
*1. **Bold** = Unacceptable Conditions*

Year 2020 Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections where a project significant impact is identified for the *Year 2020 Plus Project* conditions and determines whether a significant impact is identified.

Intersection 5 - S. Bonnyview Road & Bechelli Lane

This signalized intersection is projected to experience unacceptable queues in the southbound direction (left-turn) for the weekday AM and PM and Saturday mid-day peak hours. The proposed project creates a significant impact at this intersection ~~by causing the southbound queue to spill back to the existing signal at the Blue Shield Driveway~~ since the southbound

vehicle queue would be increased in the vicinity of a southbound horizontal curve on Bechelli Lane.

- Widen the southbound approach to provide:
  - Two left-turn pockets of length 325 feet.
  - One shared thru/left-turn lane of length 325 feet.
  - One right-turn lane of length 325 feet.

  OR

  - Construct a multi-lane roundabout.

After the mitigations stated above, the mitigated LOS is projected to be LOS D for the signal alternative and LOS A for the multi-lane roundabout alternative.

Intersection 7 - S. Bonnyview Road & I-5 Southbound Ramps

This signalized intersection is projected to operate at LOS E in the weekday AM and PM peak hours. The proposed project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable for both the AM and PM peak hour scenarios. The following improvements are proposed to mitigate the project impact to less than significant:

- Provide improvements recommended under *Existing Plus Project* conditions
- Extend the southbound right-turn lanes to 275 feet

OR

- Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.

After the mitigations stated above, the mitigated LOS is projected to be LOS C for the signal alternative and LOS B for the diverging diamond interchange alternative.

Intersection 13 - Churn Creek Road & Victor Avenue

This unsignalized intersection is projected to operate at LOS F during the PM peak hour. Although this intersection operates at an unacceptable LOS F in the "no project" condition, the proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle. The following improvements are proposed to mitigate the project impact to less than significant:

- Construct a southbound right-turn pocket.

After the mitigations stated above, the mitigated LOS is projected to be LOS D.

Intersection 14 - Churn Creek Road & Rancho Road

This unsignalized intersection is projected to operate at LOS D during the PM peak hour. The proposed project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable, and meeting the peak hour traffic signal warrant. The following improvements are proposed to mitigate the project impact to less than significant:

- Construct a southbound right-turn pocket.

After the mitigations stated above, the mitigated LOS is projected to be LOS C.

Roadway Segments

The following improvements are proposed to provide acceptable operations at roadways where a project significant impact is identified for the *Year 2020 Plus Project* conditions.

Segment 2 - Churn Creek Road (from S. Bonnyview Road to Victor Avenue)

This roadway segment is projected to operate at LOS E during the weekday AM and PM peak hour. The proposed project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable. The following improvements are proposed to mitigate the project impact to less than significant:

- Improvements to Intersection 11- Churn Creek Road & Hartmeyer Lane:
  - Eliminate the westbound left movement.
  - Provide a receiving lane on westbound Churn Creek Road for northbound left-turns from Hartmeyer Lane.
  - Provide a northbound right-turn lane.
  - Widen adjacent bridge to accommodate intersection improvements.
- Improvements to Intersection 12 - Churn Creek Road & Huntington Drive:
  - ~~Provide~~ Construct a Two-Way-Left-Turn-Lane (TWLTL), from approximately the bridge over Churn Creek to intersections 13 & 14 ~~along eastbound –westbound Churn Creek Road~~.

  OR

  - Construct a TWLTL, from approximately the bridge over Churn Creek to intersections 13 & 14, however, eliminate left-turns at Huntington Drive, close gap in Huntington Drive, and construct a compact roundabout at Victor Avenue/El Verano Drive intersection.
- Improvements to Intersections 13 & 14 (Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road):
  - Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single-lane roundabout.

Year 2040 Plus Project Impacts

Table 36A presents the intersections projected to operate at unacceptable levels of service under *Year 2040 Plus Project* conditions and determines whether a significant impact is identified.

TABLE 36A
YEAR 2040 PLUS PROJECT SIGNIFICANT IMPACTS AT INTERSECTIONS

AM Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 Delay (D1)	Year 2040 Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**C**	**E**	**23.3**	**58.6**	**35.3**	**-**	**-**	**-**	**Yes**
7	**S Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**D**	**F**	**43.9**	**83.5**	**39.6**	**-**	**-**	**-**	**Yes**
8	**S Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**D**	**E**	**46.0**	**59.2**	**13.2**	**-**	**-**	**-**	**Yes**
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	F	F	52.3	61.6	9.3	No	0.41	2	No
12	Churn Creek Rd/ Huntington Dr	TWSC	D	E	E	39.3	45.8	6.5	No	0.27	1	No
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**F**	**F**	**60.7**	**84.5**	**23.8**	**Yes**	**1.00**	**11**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**E**	**E**	**36.0**	**45.7**	**9.7**	**Yes**	**0.93**	**13**	**Yes**
16	Rancho Rd/ Shasta View Dr	TWSC	C	F	F	114.8	143.6	28.8	No	0.35	2	No
17	Rancho Rd/ Airport Rd	Signal	C	D	D	37.5	41.0	3.5	No	-	-	No
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**F**	**F**	**80.1**	**116.9**	**36.8**	**Yes**	**0.92**	**9**	**Yes**
27	Churn Creek Rd/ Hartnell Ave	Signal	C	E	E	56.8	59.7	2.9	-	-	-	No

PM Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 Delay (D1)	Year 2040 Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**C**	**E**	**27.3**	**76.3**	**49.0**	**-**	**-**	**-**	**Yes**
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	C	E	24.6	35.8	11.2	No	0.32	2	No
7	**S Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**D**	**F**	**41.8**	**114.7**	**72.9**	**-**	**-**	**-**	**Yes**
11	**Churn Creek Rd/ Hartmeyer Ln**	**TWSC**	**E**	**F**	**F**	**81.7**	**107.3**	**25.6**	**Yes**	**0.85**	**6**	**Yes**
12	Churn Creek Rd/ Huntington Dr	TWSC	D	D	E	32.9	37.1	4.2	No	0.16	1	No
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**F**	**F**	**OVR**	**OVR**	**>5**	**Yes**	**1.84**	**26**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**F**	**F**	**52.6**	**72.2**	**19.6**	**Yes**	**1.00**	**13**	**Yes**
16	Rancho Rd/ Shasta View Dr	TWSC	C	F	F	63.0	89.6	26.6	No	0.19	1	No
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**F**	**F**	**OVR**	**OVR**	**>5**	**Yes**	**1.82**	**15**	**Yes**
27	Churn Creek Rd/ Hartnell Ave	Signal	C	E	E	58.5	60.4	1.9	No	-	-	No

Saturday Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 Delay (D1)	Year 2040 Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
12	**Churn Creek Rd/ Huntington Dr**	**TWSC**	**D**	**E**	**F**	**36**	**52.1**	**16.1**	**Yes**	**0.59**	**4**	**Yes**
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**D**	**F**	**32.8**	**54.2**	**21.4**	**Yes**	**0.87**	**9**	**Yes**

Notes:
1. TWSC = Two Way Stop Control, OVR = >300 Seconds Delay
2. LOS = Delay based on worst minor street movement for TWSC intersections, average delay for AWSC and Signal intersections.
3. V/C and 95% Queue not reported if not required to determine significance
*4. **Bold** = Unacceptable Conditions*
5. OVR = Delay exceeds 300 seconds

Table 36B presents the roadway segments projected to operate at unacceptable levels of service under *Year 2040 Plus Project* conditions and determines whether a significant impact is identified.

TABLE 36B
YEAR 2040 PLUS PROJECT SIGNIFICANT IMPACTS AT ROADWAY SEGMENTS

AM Peak Hour										
#	Roadway Segment	Control Type[1]	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 V/C Ratio (V/C_1) or Ave. Arterial Speed (AAS_1)	Year 2040+P V/C Ratio (V/C_2) or Ave. Arterial Speed (AAS_2)	Percentage Increase in V/C Ratio (V/C_1-V/C_2) or Decrease in Ave. Arterial Speed (AAS_1-AAS_2)	Significant Impact?
1	**S. Bonnyview Rd between SR 273 & Churn Creek Rd**	**Divided Arterial**	**D**	**D**	**E**	**20.2**	**14.2**	**29.7%**	**Yes**
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	F	F	1.13	1.18	4.8%	No

PM Peak Hour										
#	Roadway Segment	Control Type[1]	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 V/C Ratio (V/C_1) or Ave. Arterial Speed (AAS_1)	Year 2040+P V/C Ratio (V/C_2) or Ave. Arterial Speed (AAS_2)	Percentage Increase in V/C Ratio (V/C_1-V/C_2) or Decrease in Ave. Arterial Speed (AAS_1-AAS_2)	Significant Impact?
1	**S. Bonnyview Rd between SR 273 & Churn Creek Rd**	**Divided Arterial**	**D**	**D**	**E**	**18.90**	**16.30**	**13.8%**	**Yes**
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	F	F	1.20	1.26	4.9%	No
4	**Bechelli Ln between S. Bonnyview Rd & Chinook Dr**	**Undivided Arterial**	**C**	**C**	**E**	**0.91**	**1.24**	**36.8%**	**Yes**
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	E	E	1.14	1.17	2.7%	No

Notes:

1. ***Bold*** *= Unacceptable Conditions*

Table 36C presents the freeway mainline and ramp segments projected to operate at unacceptable levels of service under *Year 2040 Plus Project* conditions and determines whether a significant impact is identified.

TABLE 36C
YEAR 2040 PLUS PROJECT SIGNIFICANT IMPACTS AT FREEWAY MAINLINE & RAMPS

AM Peak Hour									
#	Freeway Segment	Segment Type	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 Density (pc/mi/ln) (D1)	Year 2040+P Density (pc/mi/ln) (D2)	Percentage Increase in Density (D2-D1)	Significant Impact?
6	Knighton Rd to Bonnyview Rd NB	Mainline	D	E	E	36.8	38	3%	No
7	Knighton Rd On Ramp NB	Merge	D	E	E	35.6	36.2	2%	No

PM Peak Hour									
#	Freeway Segment	Segment Type	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 Density (pc/mi/ln) (D1)	Year 2040+P Density (pc/mi/ln) (D2)	Percentage Increase in Density (D2-D1)	Significant Impact?
8	Knighton Rd Off Ramp SB	Diverge	D	E	E	38.2	39.0	2.1%	No
9	S. Bonnyview Rd to Knighton Rd SB	Mainline	D	E	E	39.0	40.6	4.1%	No

Saturday Peak Hour									
#	Freeway Segment	Segment Type	Target LOS	Year 2040 LOS[2]	Year 2040 Plus Project LOS[2]	Year 2040 Density (pc/mi/ln) (D1)	Year 2040+P Density (pc/mi/ln) (D2)	Percentage Increase in Density (D2-D1)	Significant Impact?
8	**Knighton Rd Off Ramp SB**	**Diverge**	**D**	**D**	**E**	**34.9**	**36.0**	**3.2%**	**Yes**
9	**S. Bonnyview Rd to Knighton Rd SB**	**Mainline**	**D**	**D**	**E**	**33.3**	**35.1**	**5.4%**	**Yes**

Notes:

1. ***Bold*** *= Unacceptable Conditions*

Year 2040 Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections where a project significant impact is identified for the *Year 2040 Plus Project* conditions and determines whether a significant impact is identified.

Intersection 5 - S. Bonnyview Road & Bechelli Lane

This signalized intersection is projected to operate at LOS E for the weekday AM and PM peak hour scenarios. The proposed project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable for the AM and PM peak hours. The following improvements are proposed to mitigate the project impact to less than significant:

- Provide improvements recommended under *Year 2020 Plus Project* conditions
- Widen the eastbound approach to provide:
    - One left-turn lane of length 400 feet.
    - Two thru lanes of length 400 feet.
    - One shared thru/right-turn lane of length 350 feet.

  OR
- Construct a multi-lane roundabout

After the mitigations stated above, the mitigated LOS is projected to be LOS D for the signal alternative and LOS B for the multi-lane roundabout alternative.

Intersection 7 - S. Bonnyview Road & I-5 Southbound Ramps

This signalized intersection is projected to operate at LOS F in the weekday AM and PM peak hours. The proposed project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable for the AM and PM peak hours. Furthermore, the proposed project causes the delay to increase by more than 5 seconds per vehicle. The following improvements are proposed to mitigate the project impact to less than significant:

- Provide improvements recommended under *Existing Plus Project* conditions and *2020 Plus Project* conditions
- Widen the westbound approach to provide:
    - Two left-turn lanes.
- Extend southbound right-turn lanes and thru/left pocket to 400 feet.

  OR
- Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.

After the mitigations stated above, the mitigated LOS is projected to be LOS D for the signal alternative and LOS C for the diverging diamond interchange alternative.

Intersection 8 - S. Bonnyview Road & I-5 Northbound Ramps

This signalized intersection is projected to operate at LOS E in the weekday AM peak hour. The proposed project creates a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable in the AM peak hour. The following improvements are proposed to mitigate the project impact to less than significant:

- Provide improvements recommended under *Existing Plus Project* conditions

- Add Northbound left-turn lane and
- Extend all northbound turn lanes to 500 feet.

  OR

- Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange.

After the mitigations stated above, the mitigated LOS is projected to be LOS C for the signal alternative and LOS C for the diverging diamond interchange alternative.

Intersection 11 - Churn Creek Road & Hartmeyer Lane

This unsignalized intersection is projected to operate at LOS F in the weekday PM peak hour. The proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably, and meets the PM peak hour signal warrant for the PM peak hour. The following improvements are proposed to mitigate the project impact to less than significant:

- Reconstruct intersection to achieve the following:
  - Eliminate westbound left-turn movement.
  - Provide a receiving lane on westbound Churn Creek Road for northbound left-turns.
  - Provide a northbound right-turn lane.
  - Widen adjacent bridge to accommodate intersection improvements.

After the mitigations stated above, the mitigated LOS is projected to be LOS C.

Intersection 12 - Churn Creek Road & Huntington Drive

This unsignalized intersection is projected to operate at LOS F during the Saturday mid-day peak hour of the "plus project" condition. The proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating at an unacceptable LOS and meets the peak hour signal warrant. As Churn Creek Road does not operate exclusively within an urban setting in the vicinity of Huntington Drive, the peak hour signal warrant was conducted for rural conditions. The following improvements are proposed to mitigate the project impact to less than significant:

- Reconstruct the intersection to achieve the following:
  - A two-way-left-turn lane (TWLTL) along eastbound-westbound Churn Creek Road

After the mitigations stated above, the mitigated LOS is projected to be LOS C.

Intersection 13 - Churn Creek Road & Victor Avenue

This unsignalized intersection is projected to operate at LOS F during the weekday AM and PM, and Saturday mid-day peak hours of the "plus project" condition. The proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating at an unacceptable LOS and meets the peak hour signal warrant. The following improvements are proposed to mitigate the project impact to less than significant:

- Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single lane roundabout.

After the mitigations stated above, the mitigated LOS is projected to be LOS B.

Intersection 14 - Churn Creek Road & Rancho Road

This unsignalized intersection is projected to operate at LOS E and LOS F during the weekday AM and PM peak hours. The proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably, and meets the peak hour signal warrant. The following improvements are proposed to mitigate the project to less than significant:

- Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single lane roundabout.

After the mitigations stated above, the mitigated LOS is projected to be LOS B.

Intersection 21 - Bechelli Lane & Loma Vista Drive

This unsignalized intersection is projected to operate at LOS F during the weekday AM and PM peak hours. The proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably, and meets the peak hour signal warrant. The following improvements are proposed to mitigate the project to less than significant:

- Construct a traffic signal with split phasing for the eastbound and westbound approaches, and protected left-turn movements on northbound and southbound approaches

OR

- Construct a 4-leg, single-lane roundabout.

After the mitigations stated above, the mitigated LOS is projected to be LOS C for the signal alternative and LOS B for the single-lane roundabout alternative.

Roadway Segments

The following improvements are proposed to provide acceptable operations at roadways where a project significant impact is identified for the *Year 2040 Plus Project* conditions.

Segment 1 - S. Bonnyview Road (from SR 273 to Churn Creek Road)

This roadway segment is projected to operate at LOS E in the weekday AM and PM peak hours. The proposed project creates a significant impact by causing the average arterial speed to decrease by more than 5% at a roadway operating unacceptably. The following improvement is proposed to mitigate the project impact to less than significant:

- Construct improvements identified for *Year 2040 Plus Project* at intersections of 5, 7, and 8 to provide acceptable roadway operations.

Segment 4 – Bechelli Lane (from S. Bonnyview Road to Chinook Drive)

This roadway segment is projected to operate at LOS E during the ~~Saturday mid-day~~ PM peak hour. The proposed project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable. The following intersection improvements are proposed to mitigate the project impact to less than significant:

- Construct a TWLTL on Bechelli Lane from Chinook Drive to Northern Driveway.

Freeway Mainline and Ramp Segments

The following improvements are proposed to provide acceptable operations on freeway mainline segments and ramps where a project significant impact is identified for the *Year 2040 Plus Project* conditions.

Segment 8 - I-5 SB Knighton Road Off Ramp (Diverge)

This freeway diverge ramp is projected to operate at LOS E during the Saturday mid-day peak hour. The project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable. The following improvement can mitigate the project impact to less than significant:

- Widen the mainline segment from two (2) lanes to three (3) lanes in each direction.

Segment 9 - I-5 SB from S. Bonnyview Road to Knighton Road

This freeway mainline segment is projected to operate at LOS E during the Saturday mid-day peak hour. The project creates a significant impact by causing the LOS to deteriorate from acceptable to unacceptable and by causing the lane density to increase by 5%. the following improvement can mitigate the project impact to less than significant:

- Widen the mainline segment from two (2) lanes to three (3) lanes in each direction.

Proposed Improvements for Site Access

The following section presents proposed improvements for site access at the four proposed project driveways.

Driveway Throat Depths

The following section presents the minimum throat depths necessary to service the projected queues for the "plus project" conditions. Table 37A presents a summary of the driveway queues projected for the Existing Plus Project, Year 2020 Plus Project and Year 2040 Plus Project scenarios.

TABLE 37A
SUMMARY OF NON-MITIGATED PROJECTED 95TH PERCENTILE QUEUE LENGTHS FOR PROJECT DRIVEWAYS

Int. #	Intersection/Approach	Control Type	Existing Plus Project 95th Percentile Queue (ft)			Year 2020 Plus Project 95th Percentile Queue (ft)			Year 2040 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
6B	***S. Bonnyview Rd & S. Bonnyview Dwy***											
	Southbound Right	TWSC	70	75	67	65	62	88	70	74	~~88~~ 85	
18	***Bechelli Lane & Blue Shield Dwy/Middle Dwy***											
	Westbound Left	Signal	62	782	314	58	512	134	66	1035	152	
	Westbound Left/Thru		68	808	312	79	599	201	~~79~~ 65	1015	228	
	Westbound Right		17	***103***	***66***	19	***94***	***86***	20	***97***	***~~86~~ 76***	60
	Northbound Right		14	54	85	18	60	66	~~18~~ 17	51	~~66~~ 57	
	Southbound Left		55	***192***	102	57	115	82	~~57~~ 53	***192***	93	125
28	***Bechelli Lane & Northern Dwy***											
	Westbound Left/Right	TWSC	51	194	69	48	62	73	53	230	~~73~~ 72	
	Southbound Left		9	19	25	10	14	15	10	43	21	50
29	***Bechelli Lane & Southern Dwy***											
	Westbound Left	TWSC	-	-	-	95	105	88	133	170	125	
	Westbound Right		57	67	52	69	47	47	77	58	58	

Note: ***Bold*** text indicates queues that exceed available storage

Additional Queue data for the westbound left turn for Intersection 29 is included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Table 37B presents a summary of the driveway queues projected for the Year 2020 Plus Project and Year 2040 Plus Project scenarios with all recommended reference off-site mitigations.

TABLE 37B
SUMMARY OF MITIGATED PROJECTED 95TH PERCENTILE QUEUE LENGTHS FOR PROJECT DRIVEWAYS

Int. #	Intersection/Approach	Control Type	Year 2020 Plus Project 95th Percentile Queue (ft)			Year 2040 Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
6B	***S. Bonnyview Rd & S. Bonnyview Dwy***								
	Southbound Right	TWSC	102	69	72	99	110	85	
18	***Bechelli Lane & Blue Shield Dwy/Middle Dwy***								
	Westbound Left	Signal	63	132	129	71	151	166	
	Westbound Left/Thru		69	149	157	71	162	151	
	Westbound Right		19	47	60	16	42	41	60
	Northbound Right		17	57	64	18	53	70	
	Southbound Left		57	80	75	58	75	81	125
28	***Bechelli Lane & Northern Dwy***								
	Westbound Left/Right	TWSC	46	58	59	52	73	75	
	Southbound Left		8	14	14	10	13	22	
29	***Bechelli Lane & Southern Dwy***								
	Westbound Left	TWSC	95	105	88	133	170	125	
	Westbound Right		54	52	50	69	59	58	

Note: ***Bold*** text indicates queues that exceed available storage

Additional Queue data for the westbound left turn for Intersection 29 is included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Intersection 6B - S. Bonnyview Road & S. Bonnyview Driveway

At this intersection, queues are created by vehicles exiting the project via a southbound right-turn movement from S. Bonnyview Driveway to S. Bonnyview Road. After all proposed

mitigations, a driveway with a minimum throat depth of 110 feet is adequate to service queues projected for the weekday AM, PM and Saturday mid-day peak hours of the *Existing Plus Project*, *Short Term Plus Project* and *Cumulative Plus Project* conditions.

Intersection 18 - Bechelli Lane & Blue Shield Driveway/Middle Driveway

At this intersection, queues are created by vehicles exiting the project via westbound right, thru and left-turn movements from Middle Driveway to Bechelli Lane & Blue Shield Driveway. After all proposed mitigations, a driveway with a minimum throat depth of 175 feet is adequate to service queues projected for the westbound left-turn movement during the weekday AM, PM and Saturday mid-day peak hours of the *Existing Plus Project*, *Short Term Plus Project* and *Cumulative Plus Project* conditions.

Intersection 28 - Bechelli Lane & Northern Driveway

At this intersection, queues are created by vehicles exiting the project via ~~a~~ westbound right- and left-turn movements from the ~~Southern~~ Northern Driveway to Bechelli Lane. After all proposed mitigations, a driveway with a minimum throat depth of 80 feet is adequate to service queues projected for the weekday AM, PM and Saturday mid-day peak hours of the *Existing Plus Project*, *Short Term Plus Project* and *Cumulative Plus Project* conditions.

Intersection 29 - Bechelli Lane & Southern Driveway

At this intersection, queues are created by vehicles exiting the project via a westbound right-turn movement from the ~~Northern~~ Southern Driveway to Bechelli Lane. After all proposed mitigations, a driveway with a minimum throat depth of ~~80~~ 170 feet is adequate to service queues projected for the weekday AM, PM and Saturday mid-day peak hours of the *Existing Plus Project*, *Short Term Plus Project* and *Cumulative Plus Project* conditions.

Additional Queue data for Intersection 29 is included in the Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum (See Appendix I).

Diverging Diamond Interchange Mitigations

A Diverging Diamond Interchange (DDI) only has signals for the traffic crossing the interchange. The traffic entering and exiting the freeway only has to yield to existing through traffic within the interchange. Therefore, a DDI would reduce the delay of an impacted intersection by allowing easier access to and from the freeway.

Roundabout Mitigations

A roundabout as a mitigation would reduce the projected queue length and delay of an impacted intersection. This is achieved by encouraging all traffic entering the intersection to yield to existing traffic within the circulatory roadway, thereby enabling traffic to flow more freely through the roundabout.

Fair Share of Improvement Cost Calculations

Fair-share calculations have been identified for all intersections, which are projected to operate at an unacceptable LOS under *No Project* conditions, and experience an increase in delay with the addition of project traffic. Below is a listing of each of the study intersections warranting improvements, the corresponding improvements that the proposed project would be required to pay a Fair-Share of Improvement cost towards, and the proposed project's equitable share of these improvements. The proposed project's equitable share is calculated using the method for calculating equitable mitigation measures outlined in the *Caltrans Guide for the Preparation of Traffic Impact Studies* (State of California, DOT, December 2002), which is shown below:

$$P = T / (T_B - T_E) \text{ where,}$$

P = The equitable share for the project's traffic impact.

T = The vehicle trips generated by the project during the peak hour of adjacent roadway facility in vehicles per hour (vph).

T_B = The forecasted traffic volume on an impacted roadway facility at the time of general plan build-out (e.g. 20-year model or the furthest model date feasible), vph.

T_E = The traffic volume existing on the impacted roadway facility plus other approved projects that will generate traffic that has yet to be constructed/opened, vph.

Note that the percent Fair-Share calculated using the above formula is reported to the nearest whole number and the calculations are based on the highest fair share percentage from all three peak hour scenarios.

Year 2040 Plus Project Fair-Share

Upon the City's direction, fair share cost calculations were conducted for only the Cumulative (Year 2040) conditions.

Intersections

Table 38 presents a summary of the fair share cost calculations performed for intersections with significant impacts for the Year 2040 Plus Project conditions.

TABLE 38
SUMMARY OF FAIR SHARE CALCULATIONS FOR INTERSECTIONS

#	Intersection Name	T	Tb	Te	P
5	S. Bonnyview Road & Bechelli Lane	799	4511	3017	53%
7	S. Bonnyview Road & I-5 SB Ramps	774	4519	2894	48%
8	S. Bonnyview Road & I-5 NB Ramps	265	3600	2388	22%
11	Churn Creek Road & Hartmeyer Lane	80	1620	1015	13%
12	Churn Creek Rd & Huntington Dr	130	1280	698	22%
13	Churn Creek Road & Victor Avenue	130	1285	755	25%
14	Churn Creek Road & Rancho Road	51	1186	823	14%
21	Bechelli Lane & Loma Vista Drive	39	1249	879	11%

Roadways

Table 39 presents a summary of the fair share cost calculations performed for roadways with significant impacts for the Year 2040 Plus Project conditions.

TABLE 39
SUMMARY OF FAIR SHARE CALCULATIONS FOR ROADWAY SEGMENTS

#	Roadway Segment Name	Begin	End	T	Tb	Te	P
1	S. Bonnyview Road	SR 273	Churn Creek	517	2975	2138	62%
4	Bechelli Lane	Bonnyview Road	Chinook Drive	341	1419	732	50%

Freeway Mainline Segments and Ramps

Table 40 presents a summary of the fair share cost calculations performed for roadways with significant impacts for the Year 2040 Plus Project conditions.

TABLE 40
SUMMARY OF FAIR SHARE CALCULATIONS FOR FREEWAY MAINLINE SEGMENTS AND RAMPS

#	Freeway Segment/Ramp Name	Begin	End	T	Tb	Te	P
9	I-5 SB from S. Bonnyview Road to Knighton Road	S. Bonnyivew Rd	Knighton Rd	114	3580	2453	10%

Development Impact Fee Program

The following development impact fee programs include transportation facility improvements that may be applicable to this project:

I-5/South Bonnyview Road Interchange: Cost TBD.

Churn Creek Road / Victor Avenue / Rancho Road Roundabout: Cost TBD.

Shasta County Public Facilities Fee

- I-5/South Bonnyview Phase I: $7,000,000.
- I-5/South Bonnyview Phase II: $10,000,000.

Shasta County Major Road Impact Fee Program:

- South Bonnyview Road/Churn Creek Road: SR 273 to Rancho Road. Construct separation, widen, add signals. I-5 Interchange improvements including reconstruction of overcrossing and bridge. $20,750,000.

Appendices

Appendix A: Intersection Turning Movement Counts

& Project Only Traffic Figures

Appendix B: Synchro Outputs

Appendix C: HCS Outputs

Appendix D: Signal Warrant Analysis Worksheets

Appendix E: Memorandum by Kittelson & Associates on Redding Costco /Trip Information (September 13, 2016)

Appendix F: Traffic Operations and Forecasts for the Bonnyview Interchange PSR (May 2017)

Appendix G: ~~Schematic Layouts of Off Site Mitigations~~ Conceptual Designs of Proposed Improvements

Appendix H: Loma Vista Cut-Through Memorandum

Appendix I: Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum

Appendix J: Proposed Project and “Plus Rancheria” Impacts Comparison Memorandum

Appendix A: Intersection Turning Movement Counts & Project Only Traffic Figures

EXISTING PLUS PROJECT INTERSECTION MITIGATION LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
				Un-Mitigated		Mitigated		Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	63.7	E	16.9	B	75.2	E	20.0	B	-	-	-	-
8	S. Bonnyview Rd/ I-5 NB Ramps	Signal	D	39.0	D	22.3	C	30.9	C	27.1	C	-	-	-	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for

YEAR 2020 PLUS PROJECT INTERSECTION MITIGATION LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
				Un-Mitigated		Mitigated		Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
5	S. Bonnyview Rd/ Bechelli Ln	Signal	D	34.9	C	52.0	D	46.2	D	31.3	C	26.3	C	32.8	C
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	63.7	E	23.3	C	75.2	E	22.5	C	-	-	-	-
13	Churn Creek Rd/ Victor Ave	TWSC	D	-	-	-	-	78.7	F	32.8	D	-	-	-	-
14	Churn Creek Rd/ Rancho Rd	TWSC	C	-	-	-	-	25.7	D	15.3	C	-	-	-	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for

YEAR 2040 PLUS PROJECT INTERSECTION MITIGATION LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
				Un-Mitigated		Mitigated		Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
5	S. Bonnyview Rd/ Bechelli Ln	Signal	D	58.6	E	48.1	D	76.3	E	47.1	D	-	-	-	-
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	83.5	F	23.8	C	114.7	F	36.3	D	-	-	-	-
8	S. Bonnyview Rd/ I-5 NB Ramps	Signal	D	59.2	E	30.2	C	-	-	-	-	-	-	-	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	-	-	-	-	107.3	F	24.8	C	-	-	-	-
12	Churn Creek Rd/ Huntington Dr	TWSC	D	-	-	-	-	-	-	-	-	52.1	F	18.6	C
13	Churn Creek Rd/ Victor Ave	RNDBT	D	84.5	F	10.7	B	OVR	F	13.9	B	54.2	D	8.1	A
14	Churn Creek Rd/ Rancho Rd	RNDBT	C	45.7	D	10.7	B	72.2	E	13.9	B	-	-	-	-
21	Bechelli Ln/ Loma Vista Dr	Signal	C	116.9	F	21.4	C	OVR	F	27.5	C	-	-	-	-
21	Bechelli Ln/ Loma Vista Dr	RNDBT	C	116.9	F	8.2	A	OVR	F	11.3	A	-	-	-	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for

3. OVR = Delay exceeds 300 seconds

YEAR 2020 PLUS PROJECT ROADWAY SEGMENT MITIGATION LOS

#	Roadway Segment	Capacity Configuration Un-Mitigated	Capacity Configuration Mitigated	Target LOS	AM Peak Hour				PM Peak Hour			
					Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
					ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	Divided Arterial	D	614	E	614	C	623	E	623	C

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

YEAR 2040 PLUS PROJECT ROADWAY SEGMENT MITIGATION LOS

#	Roadway Segment	Capacity Configuration Un-Mitigated	Capacity Configuration Mitigated	Target LOS	AM Peak Hour				PM Peak Hour			
					ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	Divided Arterial	D	14.2	E	17.2	D	16.3	E	17	D
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	Divided Arterial	C	-	-	-	-	672	E	630	C

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

YEAR 2040 PLUS PROJECT ROADWAY SEGMENT MITIGATION LOS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes Un-Mitigated	No. of Lanes Mitigated	Saturday Peak Hour					
						Un-Mitigated			Mitigated		
						Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)										
8	Knighton Rd Off Ramp SB	D	Diverge	1	1	312	36.0	E	312	24.3	C
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	3	3,580	35.1	E	3,580	21.2	C

Notes:

Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln

Appendix B: Synchro Outputs

Mitigated LOS

Appendix C: HCS Outputs

Mitigated HCS

Appendix D: Signal Warrant Analysis Worksheets

Appendix E: Memorandum by Kittelson & Associates on Redding Costco/Trip Information (September 13, 2016)

Appendix F: Traffic Operations and Forecasts for the Bonnyview Interchange PSR (May 2017)

Appendix G: ~~Schematic Layout of Off Site Mitigations~~ Conceptual Designs of Proposed Improvements

Appendix H: Loma-Vista Cut-Through Memorandum

Appendix I: Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum

Appendix J: Proposed and “Plus Rancheria” Impacts Comparison Memorandum

Appendices

Appendix A: Intersection Turning Movement Counts

& Project Only Traffic Figures

Appendix B: Synchro Outputs

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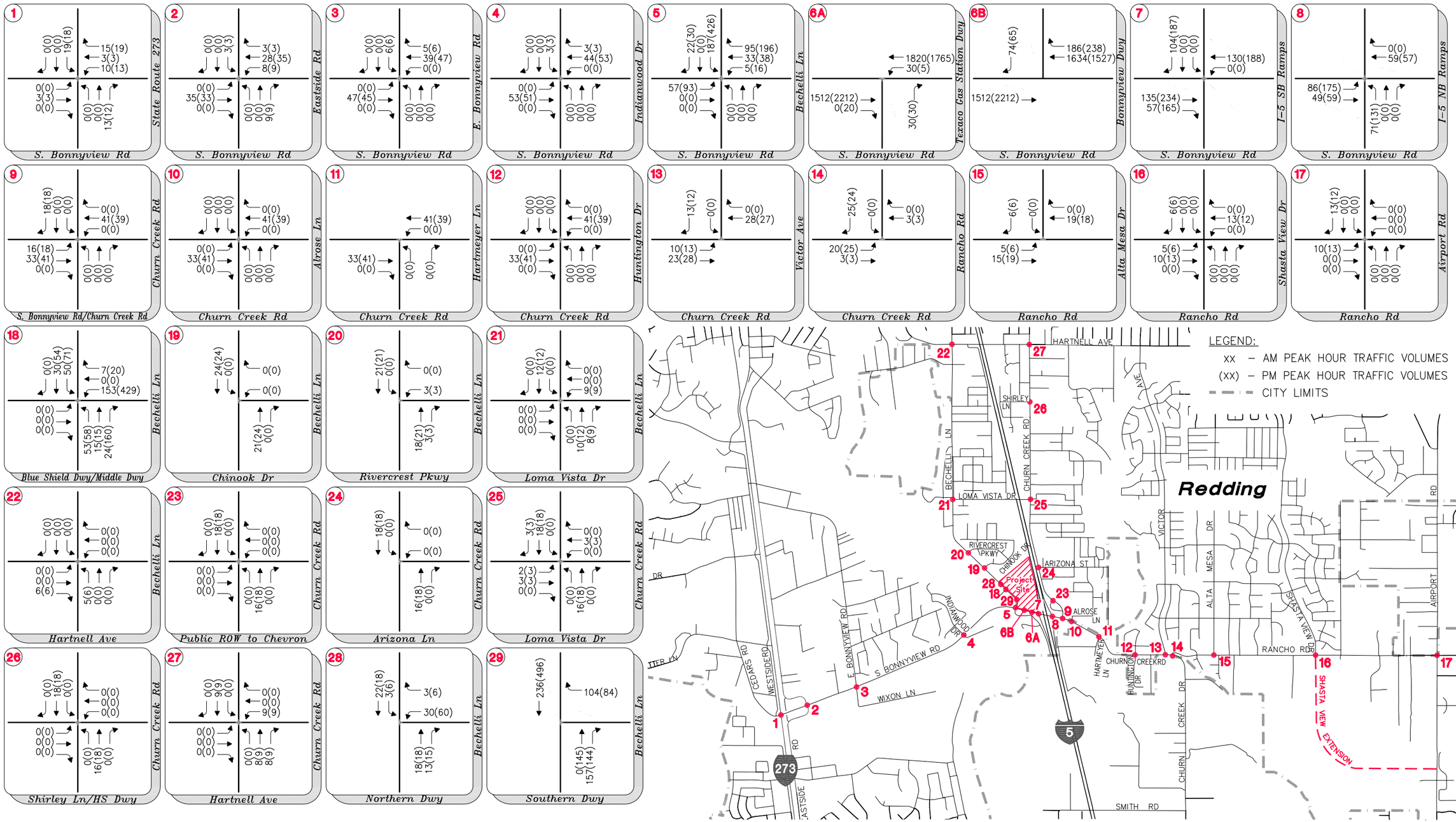
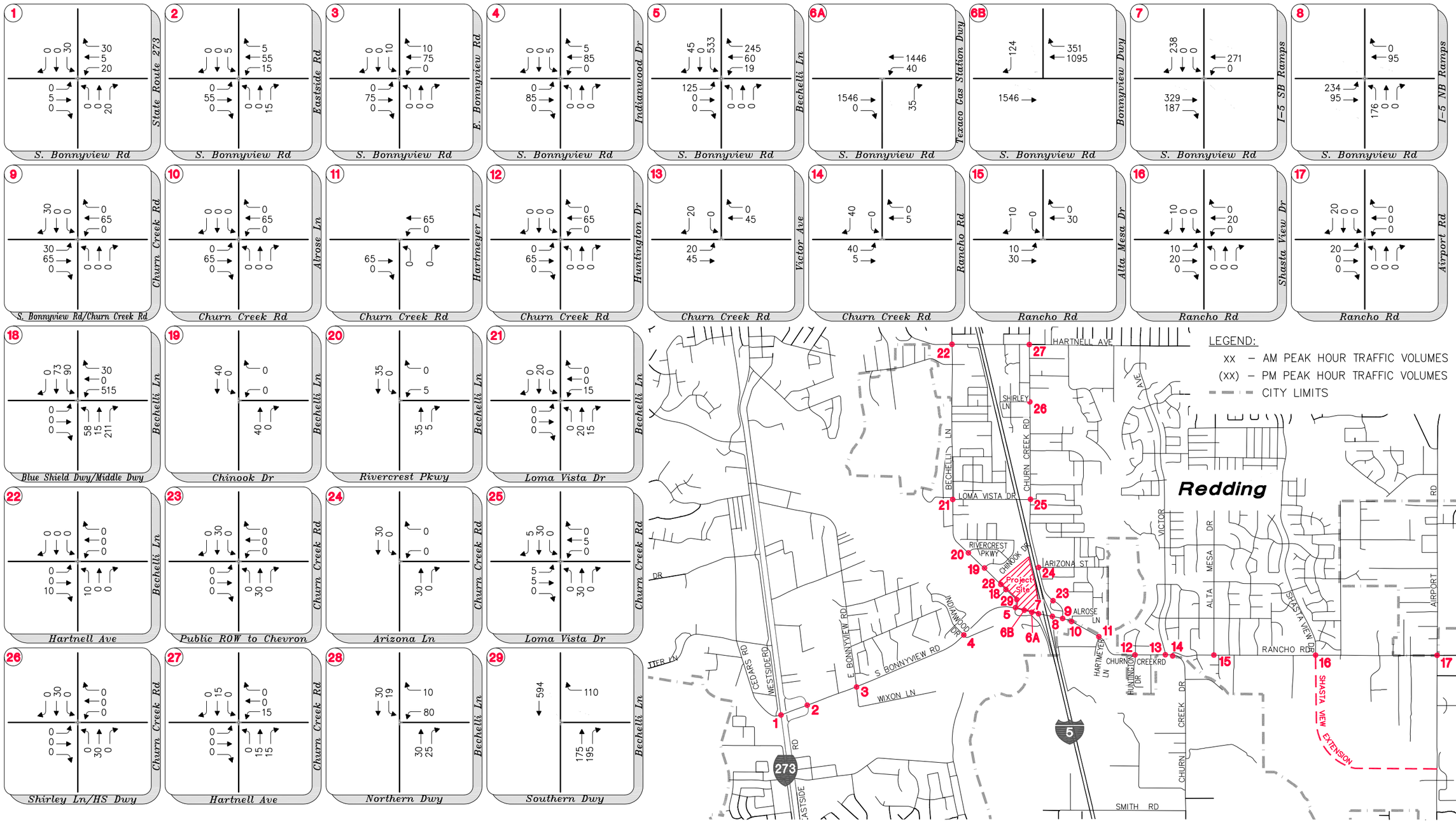


River Crossing Marketplace Specific Plan TIAR

Project Only Weekday AM and PM Peak Hour Traffic Volumes



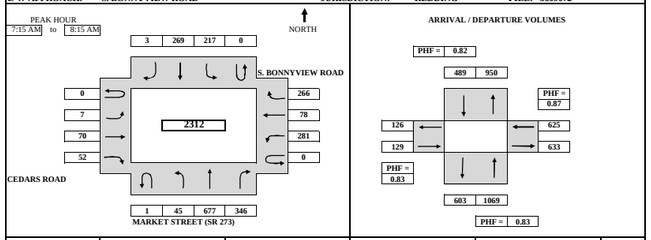
River Crossing Marketplace Specific Plan TIAR

Project Only Saturday Mid-Day Peak Hour Traffic Volumes

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: MARKET STREET (SR 273) — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM	0	5	121	70	0	27	48	0	0	12	9	0	65	14	52	0	**423**
7:15 AM	7:30 AM	1	13	265	151	0	78	106	0	3	29	28	0	126	32	100	0	**932**
7:30 AM	7:45 AM	1	31	451	269	0	147	186	1	4	51	44	0	204	43	156	0	**1588**
7:45 AM	8:00 AM	1	42	626	357	0	201	245	3	5	67	54	0	282	71	230	0	**2184**
8:00 AM	8:15 AM	1	50	798	416	0	244	317	3	7	82	61	0	346	92	318	0	**2735**
8:15 AM	8:30 AM	1	57	931	465	0	288	397	3	11	103	71	0	413	115	366	0	**3221**
8:30 AM	8:45 AM	2	60	1053	540	0	325	459	4	12	122	78	0	466	132	421	0	**3674**
8:45 AM	9:00 AM	2	72	1165	615	0	373	527	4	12	136	91	0	536	145	486	0	**4164**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	5	121	70	0	27	48	0	0	12	9	0	65	14	52	0	**423**
7:15 AM	7:30 AM	1	8	144	81	0	51	58	0	0	3	17	19	0	61	18	48	**509**
7:30 AM	7:45 AM	0	18	186	118	0	69	80	1	0	1	22	16	0	78	11	56	**656**
7:45 AM	8:00 AM	0	11	175	88	0	54	59	2	0	1	16	10	0	78	28	74	**596**
8:00 AM	8:15 AM	0	8	172	59	0	43	72	0	0	2	15	7	0	64	21	88	**551**
8:15 AM	8:30 AM	0	7	133	49	0	44	80	0	0	4	21	10	0	67	23	48	**486**
8:30 AM	8:45 AM	1	3	122	75	0	37	62	1	0	1	19	7	0	53	17	55	**453**
8:45 AM	9:00 AM	0	12	112	75	0	48	68	0	0	0	14	13	0	70	13	65	**490**
HOURLY TOTALS																		
7:00 AM	8:00 AM	1	42	626	357	0	201	245	3	0	5	67	54	0	282	71	230	**2184**
7:15 AM	8:15 AM	1	45	677	346	0	217	269	3	0	7	70	52	0	281	78	266	**2312**
7:30 AM	8:30 AM	0	44	666	314	0	210	291	3	0	8	74	43	0	287	83	266	**2289**
7:45 AM	8:45 AM	1	29	602	271	0	178	273	3	0	8	71	34	0	262	89	265	**2086**
8:00 AM	9:00 AM	1	30	539	258	0	172	282	1	0	7	69	37	0	254	74	256	**1980**

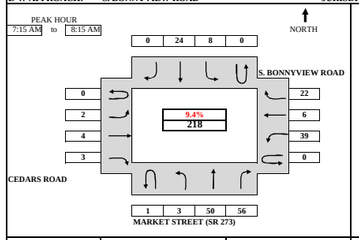
7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
PEAK HOUR SUMMARY	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	1	45	677	346	0	217	269	3	0	7	70	52	0	281	78	266	**2312**
PHF BY MOVEMENT	0.25	0.63	0.91	0.73	0.00	0.79	0.84	0.38	0.00	0.58	0.80	0.68	0.00	0.90	0.70	0.76	OVERALL
PHF BY APPROACH	0.83				0.82				0.83				0.87				0.88
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	110		74		32		67		9		68		67		9		**218**
TRUCK PERCENTAGE	10.3%		7.8%		6.5%		11.1%		7.0%		10.7%		10.7%		7.1%		**9.4%**
BICYCLE	0				0				1				0				**1**
PEDESTRIAN BY DIR:	1				1				0				2				**4**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				2				0				2				**4**

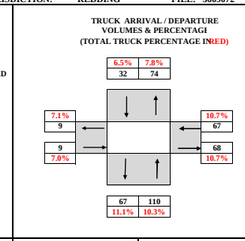
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: MARKET STREET (SR 273) — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM	0	0	7	18	0	0	3		0	1	2		8	4	4		**47**
7:15 AM	7:30 AM	0	0	19	28	0	2	9		0	3	4		17	5	6		**93**
7:30 AM	7:45 AM	1	2	31	48	0	5	12		0	4	4		28	7	10		**152**
7:45 AM	8:00 AM	1	3	42	65	0	5	16		0	5	4		38	7	16		**202**
8:00 AM	8:15 AM	1	3	57	74	0	8	27		2	5	5		47	10	26		**265**
8:15 AM	8:30 AM	1	3	66	81	0	11	36		2	9	5		55	12	30		**311**
8:30 AM	8:45 AM	1	3	79	90	0	15	42		2	11	5		69	16	40		**373**
8:45 AM	9:00 AM	1	4	87	99	0	15	48		2	12	7		83	19	41		**418**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	7	18	0	0	3	0	0	0	1	2	0	8	4	4	**47**
7:15 AM	7:30 AM	0	0	12	10	0	2	6	0	0	0	2	2	0	9	1	2	**46**
7:30 AM	7:45 AM	1	2	12	20	0	3	3	0	0	0	1	0	0	11	2	4	**59**
7:45 AM	8:00 AM	0	1	11	17	0	0	4	0	0	0	1	0	0	10	0	6	**50**
8:00 AM	8:15 AM	0	0	15	9	0	3	11	0	0	2	0	1	0	9	3	10	**63**
8:15 AM	8:30 AM	0	0	9	7	0	3	9	0	0	0	4	0	0	8	2	4	**46**
8:30 AM	8:45 AM	0	0	13	9	0	4	6	0	0	2	0	0	0	14	4	10	**62**
8:45 AM	9:00 AM	0	1	8	9	0	0	6	0	0	0	1	2	0	14	3	1	**45**
HOURLY TOTALS																		
7:00 AM	8:00 AM	1	3	42	65	0	5	16	0	0	0	5	4	0	38	7	16	**202**
7:15 AM	8:15 AM	1	3	50	56	0	8	24	0	0	2	4	3	0	39	6	22	**218**
7:30 AM	8:30 AM	1	3	47	53	0	9	27	0	0	2	6	1	0	38	7	24	**218**
7:45 AM	8:45 AM	0	1	48	42	0	10	30	0	0	2	7	1	0	41	9	30	**221**
8:00 AM	9:00 AM	0	1	45	34	0	10	32	0	0	2	7	3	0	45	12	25	**216**

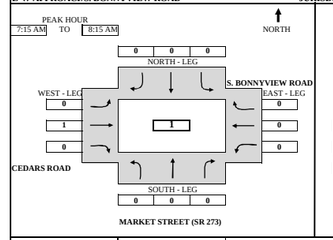
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

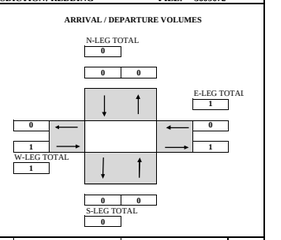
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	110	74	32	67	9	68	67	9	218
TRUCK PERCENTAGE	10.3%	7.8%	6.5%	11.1%	7.0%	10.7%	10.7%	7.1%	9.4%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: MARKET STREET (SR 273) — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	**2**
8:30 AM	8:45 AM	0	1	0	0	0	0	0	3	0	0	0	0	**4**
8:45 AM	9:00 AM	0	1	0	0	0	0	0	3	0	0	1	0	**5**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:30 AM	8:45 AM	0	1	0	0	0	0	0	1	0	0	0	0	**2**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:45 AM	8:45 AM	0	1	0	0	0	0	0	2	0	0	0	0	**3**
8:00 AM	9:00 AM	0	1	0	0	0	0	0	2	0	0	1	0	**4**

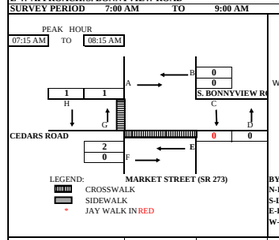
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

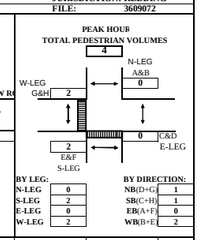
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: MARKET STREET (SR 273) — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	A	B	C *	D	E	F	G	H	TOTAL
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	**0**
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	1	**1**
07:30 AM	--- 07:45 AM	0	0	0	0	1	0	0	1	**2**
07:45 AM	--- 08:00 AM	0	0	0	0	1	0	0	1	**2**
08:00 AM	--- 08:15 AM	0	0	0	0	2	0	1	1	**4**
08:15 AM	--- 08:30 AM	0	0	1	0	2	0	1	1	**5**
08:30 AM	--- 08:45 AM	0	0	1	0	2	0	1	1	**5**
08:45 AM	--- 09:00 AM	0	0	1	0	2	0	1	1	**5**
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	**0**
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	1	**1**
07:30 AM	--- 07:45 AM	0	0	0	0	1	0	0	0	**1**
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	**0**
08:00 AM	--- 08:15 AM	0	0	0	0	1	0	1	0	**2**
08:15 AM	--- 08:30 AM	0	0	1	0	0	0	0	0	**1**
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	**0**
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	1	0	0	1	**2**
07:15 AM	--- 08:15 AM	0	0	0	0	2	0	1	1	**4**
07:30 AM	--- 08:30 AM	0	0	1	0	2	0	1	0	**4**
07:45 AM	--- 08:45 AM	0	0	1	0	1	0	1	0	**3**
08:00 AM	--- 09:00 AM	0	0	1	0	1	0	1	0	**3**

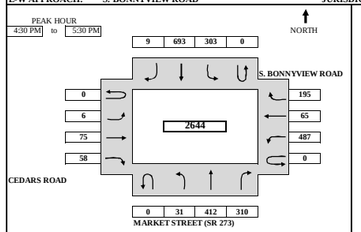
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

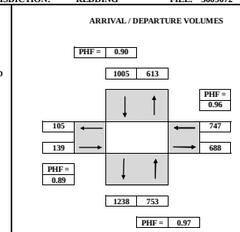
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	1	1	0	2	**4**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	2	0	2	**4**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: MARKET STREET (SR 273) **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		9	130	84		63	127	1		2	15	24		83	24	61	**623**
4:15 PM	4:30 PM		19	221	151		109	286	4		4	22	43		188	44	105	**1196**
4:30 PM	4:45 PM		28	336	221		168	439	8		4	41	58		305	63	163	**1834**
4:45 PM	5:00 PM		37	440	299		244	598	9		5	64	72		436	81	200	**2485**
5:00 PM	5:15 PM		39	544	376		330	784	11		9	84	87		555	95	256	**3170**
5:15 PM	5:30 PM		50	633	461		412	979	13		10	97	101		675	109	300	**3840**
5:30 PM	5:45 PM		58	716	553		472	1120	16		10	107	122		791	127	350	**4442**
5:45 PM	6:00 PM		70	799	613		510	1224	16		10	115	132		886	139	390	**4904**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	9	130	84	0	63	127	1	0	2	15	24	0	83	24	61	**623**
4:15 PM	4:30 PM	0	10	91	67	0	46	159	3	0	2	7	19	0	105	20	44	**573**
4:30 PM	4:45 PM	0	9	115	70	0	59	153	4	0	0	19	15	0	117	19	58	**638**
4:45 PM	5:00 PM	0	9	104	78	0	76	159	1	0	1	23	14	0	131	18	37	**651**
5:00 PM	5:15 PM	0	2	104	77	0	86	186	2	0	4	20	15	0	119	14	56	**685**
5:15 PM	5:30 PM	0	11	89	85	0	82	195	2	0	1	13	14	0	120	14	44	**670**
5:30 PM	5:45 PM	0	8	83	92	0	60	141	3	0	0	10	21	0	116	18	50	**602**
5:45 PM	6:00 PM	0	12	83	60	0	38	104	0	0	0	8	10	0	95	12	40	**462**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	37	440	299	0	244	598	9	0	5	64	72	0	436	81	200	**2485**
4:15 PM	5:15 PM	0	30	414	292	0	267	657	10	0	7	69	63	0	472	71	195	**2547**
4:30 PM	5:30 PM	0	31	412	310	0	303	693	9	0	6	75	58	0	487	65	195	**2644**
4:45 PM	5:45 PM	0	30	380	332	0	304	681	8	0	6	66	64	0	486	64	187	**2608**
5:00 PM	6:00 PM	0	33	359	314	0	266	626	7	0	5	51	60	0	450	58	190	**2419**

PEAK HOUR SUMMARY

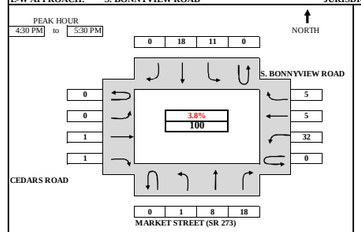
4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	31	412	310	0	303	693	9	0	6	75	58	0	487	65	195	**2644**
PHF BY MOVEMENT	0.00	0.70	0.90	0.91	0.00	0.88	0.89	0.56	0.00	0.38	0.82	0.97	0.00	0.93	0.86	0.84	OVERALL
PHF BY APPROACH		0.97				0.90				0.89				0.96			0.96
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	27		13		29		51		2		30		42		6		**100**
TRUCK PERCENTAGE	3.6%		2.1%		2.9%		4.1%		1.4%		4.4%		5.6%		5.7%		**3.8%**
BICYCLE	1				0				0				1				**2**
PEDESTRIAN BY DIR:	1				0				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				1				**1**

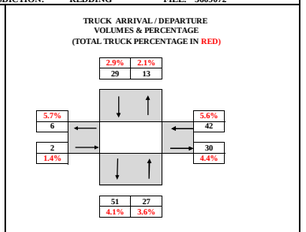
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: MARKET STREET (SR 273) **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	4	4		5	4	0		1	0	0		5	1	5	**29**
4:15 PM	4:30 PM		0	4	8		6	10	0		1	0	1		10	4	6	**50**
4:30 PM	4:45 PM		0	6	9		7	16	0		1	0	1		17	4	9	**70**
4:45 PM	5:00 PM		1	10	14		10	21	0		1	1	1		29	6	9	**103**
5:00 PM	5:15 PM		1	11	21		15	26	0		1	1	1		35	7	10	**129**
5:15 PM	5:30 PM		1	12	26		17	28	0		1	1	2		42	9	11	**150**
5:30 PM	5:45 PM		1	13	30		17	32	0		1	1	2		49	12	14	**172**
5:45 PM	6:00 PM		2	15	33		20	34	0		1	2	3		52	12	16	**190**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	4	4	0	5	4	0	0	1	0	0	0	5	1	5	**29**
4:15 PM	4:30 PM	0	0	4	4	0	1	6	0	0	0	0	1	0	5	3	1	**21**
4:30 PM	4:45 PM	0	0	2	1	0	1	6	0	0	0	0	0	0	7	0	3	**20**
4:45 PM	5:00 PM	0	1	4	5	0	3	5	0	0	0	1	0	0	12	2	0	**33**
5:00 PM	5:15 PM	0	0	1	7	0	5	5	0	0	0	0	0	0	6	1	1	**26**
5:15 PM	5:30 PM	0	0	1	5	0	2	2	0	0	0	0	1	0	7	2	1	**21**
5:30 PM	5:45 PM	0	0	1	4	0	0	4	0	0	0	0	0	0	7	3	3	**22**
5:45 PM	6:00 PM	0	1	2	3	0	3	2	0	0	0	1	1	0	3	0	2	**18**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	1	10	14	0	10	21	0	0	1	1	1	0	29	6	9	**103**
4:15 PM	5:15 PM	0	1	7	17	0	10	22	0	0	0	1	1	0	30	6	5	**100**
4:30 PM	5:30 PM	0	1	8	18	0	11	18	0	0	0	1	1	0	32	5	5	**100**
4:45 PM	5:45 PM	0	1	7	21	0	10	16	0	0	0	1	1	0	32	8	5	**102**
5:00 PM	6:00 PM	0	1	5	19	0	10	13	0	0	0	1	2	0	23	6	7	**87**

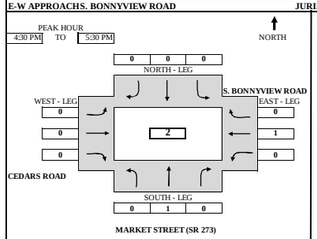
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

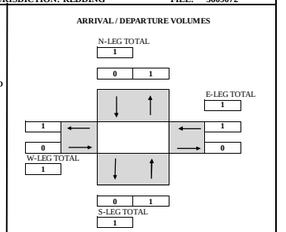
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	27	13	29	51	2	30	42	6	100
TRUCK PERCENTAGE	3.6%	2.1%	2.9%	4.1%	1.4%	4.4%	5.6%	5.7%	3.8%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: MARKET STREET (SR 273) **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACHS. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	1	1	0	**2**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	**2**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	1	1	0	**2**
4:45 PM	5:00 PM	0	1	0	0	0	0	0	0	0	1	1	0	**3**
5:00 PM	5:15 PM	0	1	0	0	0	0	0	0	0	1	2	0	**4**
5:15 PM	5:30 PM	0	1	0	0	0	0	0	0	0	1	2	0	**4**
5:30 PM	5:45 PM	0	1	0	0	0	0	0	0	1	1	3	0	**6**
5:45 PM	6:00 PM	0	1	0	0	1	0	0	0	1	1	3	0	**7**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	1	1	0	**2**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	1	1	0	**1**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	1	1	0	**2**
5:45 PM	6:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	1	0	0	0	0	0	0	0	1	1	0	**3**
4:15 PM	5:15 PM	0	1	0	0	0	0	0	0	0	0	1	0	**2**
4:30 PM	5:30 PM	0	1	0	0	0	0	0	0	0	1	1	0	**2**
4:45 PM	5:45 PM	0	1	0	0	0	0	0	0	1	0	2	0	**4**
5:00 PM	6:00 PM	0	0	0	0	1	0	0	0	1	0	2	0	**4**

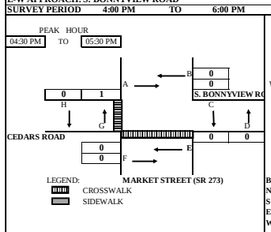
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

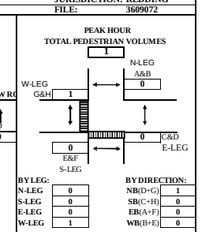
4:30 PM to 5:30 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH					
BICYCLE	1	0	0	1	**2**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016
N-S APPROACH: MARKET STREET (SR 273) **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM **FILE:** 3609072





BY LEG:

N-LEG	0
S-LEG	0
E-LEG	0
W-LEG	1

BY DIRECTION:

NB(D+G)	1
SB(C+H)	0
EB(A+F)	0
WB(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	0	0	0	0	0	0	1	0	***1***
04:45 PM	05:00 PM	0	0	0	0	0	0	1	0	***1***
05:00 PM	05:15 PM	0	0	0	0	0	0	1	0	***1***
05:15 PM	05:30 PM	0	0	0	0	0	0	1	0	***1***
05:30 PM	05:45 PM	0	0	0	0	0	1	2	0	***3***
05:45 PM	06:00 PM	0	0	0	0	0	1	3	1	***6***
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	0	0	0	0	0	0	1	0	***1***
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	05:45 PM	0	0	0	0	0	1	1	0	***2***
05:45 PM	06:00 PM	0	0	0	0	0	1	2	1	***3***
HOURLY TOTALS										
04:00 PM	05:00 PM	0	0	0	0	0	0	1	0	***1***
04:15 PM	05:15 PM	0	0	0	0	0	0	1	0	***1***
04:30 PM	05:30 PM	0	0	0	0	0	0	1	0	***1***
04:45 PM	05:45 PM	0	0	0	0	0	1	1	0	***2***
05:00 PM	06:00 PM	0	0	0	0	0	1	2	1	***5***

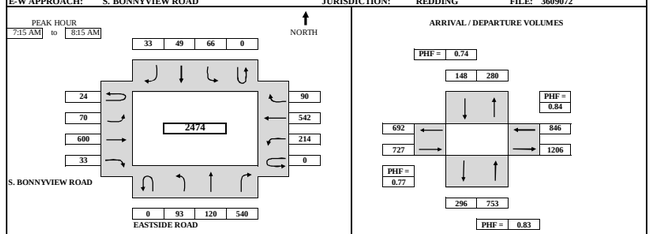
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

4:30 PM to 5:30 PM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION					
PEDESTRIAN	1	0	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	1	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: EASTSIDE ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		31	22	95		16	4	7	5	19	86	5		41	86	11	**428**
7:15 AM	7:30 AM		50	56	223		31	16	8	10	37	218	11		89	198	25	**972**
7:30 AM	7:45 AM		72	88	395		48	35	22	13	53	390	19		133	312	55	**1635**
7:45 AM	8:00 AM		98	114	515		59	45	27	24	76	581	31		199	475	78	**2322**
8:00 AM	8:15 AM		124	142	635		82	53	40	29	89	686	38		255	628	101	**2902**
8:15 AM	8:30 AM		142	148	720		98	66	45	34	109	798	52		304	773	116	**3405**
8:30 AM	8:45 AM		159	159	804		123	81	52	37	114	891	57		338	900	131	**3846**
8:45 AM	9:00 AM		180	167	895		141	89	59	39	125	1028	66		380	1024	152	**4345**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	31	22	95	0	16	4	7	5	19	86	5	0	41	86	11	**428**
7:15 AM	7:30 AM	0	19	34	128	0	15	12	1	5	18	132	6	0	48	112	14	**544**
7:30 AM	7:45 AM	0	22	32	172	0	17	19	14	3	16	172	8	0	44	114	30	**663**
7:45 AM	8:00 AM	0	26	26	120	0	11	10	5	11	23	191	12	0	66	163	23	**687**
8:00 AM	8:15 AM	0	26	28	120	0	23	8	13	5	13	105	7	0	56	153	23	**580**
8:15 AM	8:30 AM	0	18	6	85	0	16	13	5	5	20	112	14	0	49	145	15	**503**
8:30 AM	8:45 AM	0	17	11	84	0	25	15	7	3	5	93	5	0	34	127	15	**441**
8:45 AM	9:00 AM	0	21	8	91	0	18	8	7	2	11	137	9	0	42	124	21	**499**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	98	114	515	0	59	45	27	24	76	581	31	0	199	475	78	**2322**
7:15 AM	8:15 AM	0	93	120	540	0	66	49	33	24	70	600	33	0	214	542	90	**2474**
7:30 AM	8:30 AM	0	92	92	497	0	67	50	37	24	72	580	41	0	215	575	91	**2433**
7:45 AM	8:45 AM	0	87	71	409	0	75	46	30	24	61	501	38	0	205	588	76	**2211**
8:00 AM	9:00 AM	0	82	53	380	0	82	44	32	15	49	447	35	0	181	549	74	**2023**

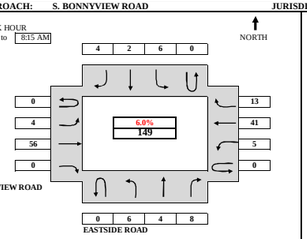
7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
PEAK HOUR SUMMARY	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	93	120	540	0	66	49	33	24	70	600	33	0	214	542	90	**2474**
PHF BY MOVEMENT	0.00	0.89	0.88	0.78	0.00	0.72	0.64	0.59	0.55	0.76	0.79	0.69	0.00	0.81	0.83	0.75	OVERALL
PHF BY APPROACH		0.83				0.74				0.77				0.84			0.90
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	18		21		12		7		60		70		59		51		**149**
TRUCK PERCENTAGE	2.4%		7.5%		8.1%		2.4%		8.3%		5.8%		7.0%		7.4%		**6.0%**
BICYCLE	0				0				1				0				**1**
PEDESTRIAN BY DIR:	0				3				0				3				**6**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	3				0				0				3				**6**

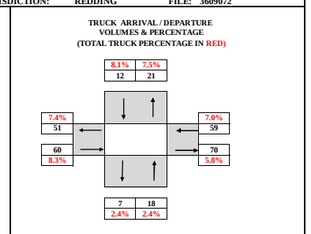
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: EASTSIDE ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0	0	2		6	2	4		2	8	0		1	6	3	**34**
7:15 AM	7:30 AM		1	1	5		8	3	4		4	17	0		1	13	4	**61**
7:30 AM	7:45 AM		2	3	6		10	4	7		4	37	0		2	23	5	**103**
7:45 AM	8:00 AM		4	3	7		10	4	7		6	48	0		4	34	10	**137**
8:00 AM	8:15 AM		6	4	10		12	4	8		6	64	0		6	47	16	**183**
8:15 AM	8:30 AM		6	4	11		19	4	9		6	75	0		7	63	19	**223**
8:30 AM	8:45 AM		6	4	11		19	4	9		6	85	0		8	74	19	**245**
8:45 AM	9:00 AM		6	4	12		23	6	11		6	96	0		9	85	21	**279**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	2	0	6	2	4	0	2	8	0	0	1	6	3	**34**
7:15 AM	7:30 AM	0	1	1	3	0	2	1	0	0	2	9	0	0	0	7	1	**27**
7:30 AM	7:45 AM	0	1	2	1	0	2	1	3	0	0	20	0	0	1	10	1	**42**
7:45 AM	8:00 AM	0	2	0	1	0	0	0	0	0	2	11	0	0	2	11	5	**34**
8:00 AM	8:15 AM	0	2	1	3	0	2	0	1	0	0	16	0	0	2	13	6	**46**
8:15 AM	8:30 AM	0	0	0	1	0	7	0	1	0	0	11	0	0	1	16	3	**40**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	1	11	0	**22**
8:45 AM	9:00 AM	0	0	0	1	0	4	2	2	0	0	11	0	0	1	11	2	**34**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	4	3	7	0	10	4	7	0	6	48	0	0	4	34	10	**137**
7:15 AM	8:15 AM	0	6	4	8	0	6	2	4	0	4	56	0	0	5	41	13	**149**
7:30 AM	8:30 AM	0	5	3	6	0	11	1	5	0	2	58	0	0	6	50	15	**162**
7:45 AM	8:45 AM	0	4	1	5	0	9	0	2	0	2	48	0	0	6	51	14	**142**
8:00 AM	9:00 AM	0	2	1	5	0	13	2	4	0	0	48	0	0	5	51	11	**142**

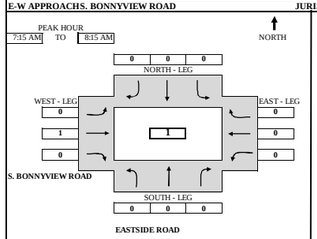
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

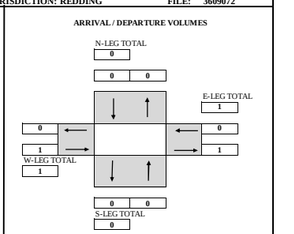
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	18	21	12	7	60	70	59	51	149
TRUCK PERCENTAGE	2.4%	7.5%	8.1%	2.4%	8.3%	5.8%	7.0%	7.4%	6.0%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH:EASTSIDE ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACHS. BONNYVIEW ROAD **JURISDICTION: REDDING** **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	1	0	2	0	0	**3**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	1	0	2	0	0	**3**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	1	0	2	0	0	**3**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	1	0	2	0	0	**3**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	1	0	2	0	0	**2**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	1	0	2	0	0	**2**

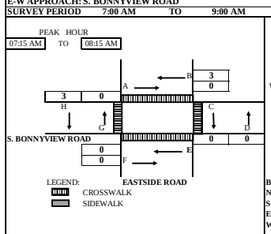
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

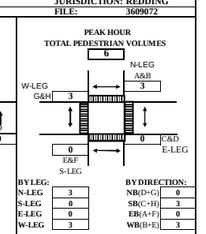
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016
N-S APPROACH: EASTSIDE ROAD **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM **FILE:** 3609072





BY LEG:	
N-LEG	3
S-LEG	0
E-LEG	0
W-LEG	3

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	3
EB(A+F)	0
WB(B+E)	3

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	A	B	C	D	E	F	G	H	TOTAL
SURVEY DATA										
07:00 AM	07:15 AM	0	0	0	0	0	0	0	0	**0**
07:15 AM	07:30 AM	0	1	0	0	0	0	0	1	**2**
07:30 AM	07:45 AM	0	2	0	0	0	0	0	2	**4**
07:45 AM	08:00 AM	0	2	0	0	0	0	0	2	**4**
08:00 AM	08:15 AM	0	3	0	0	0	0	0	3	**6**
08:15 AM	08:30 AM	0	3	0	0	0	0	0	3	**6**
08:30 AM	08:45 AM	0	3	0	0	0	0	0	3	**6**
08:45 AM	09:00 AM	0	3	0	0	0	1	0	3	**7**
TOTAL BY PERIOD										
07:00 AM	07:15 AM	0	0	0	0	0	0	0	0	**0**
07:15 AM	07:30 AM	0	1	0	0	0	0	0	1	**2**
07:30 AM	07:45 AM	0	1	0	0	0	0	0	1	**2**
07:45 AM	08:00 AM	0	0	0	0	0	0	0	0	**0**
08:00 AM	08:15 AM	0	1	0	0	0	0	0	1	**2**
08:15 AM	08:30 AM	0	0	0	0	0	0	0	0	**0**
08:30 AM	08:45 AM	0	0	0	0	0	0	0	0	**0**
08:45 AM	09:00 AM	0	0	0	0	0	1	0	0	**1**
HOURLY TOTALS										
07:00 AM	08:00 AM	0	2	0	0	0	0	0	2	**4**
07:15 AM	08:15 AM	0	3	0	0	0	0	0	3	**6**
07:30 AM	08:30 AM	0	2	0	0	0	0	0	2	**4**
07:45 AM	08:45 AM	0	1	0	0	0	0	0	1	**2**
08:00 AM	09:00 AM	0	1	0	0	0	1	0	1	**3**

Tel : (510) 232-1271 *Fax: (510) 232-1272*

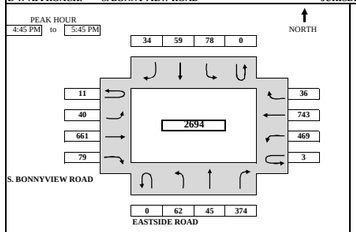
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	3	0	3	**6**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	3	0	0	3	**6**

B.A.Y.M.E.T.R.I.C.S.

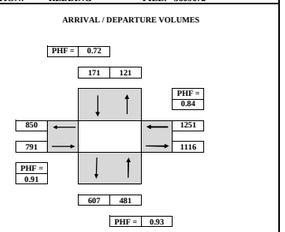
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: EASTSIDE ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:45 PM to 5:45 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		16	12	57		23	16	9	5	10	137	24	1	77	159	12	**558**
4:15 PM	4:30 PM		28	24	138		38	33	22	7	16	247	41	2	180	353	35	**1164**
4:30 PM	4:45 PM		46	32	207		52	57	28	9	21	363	60	4	276	531	47	**1733**
4:45 PM	5:00 PM		58	46	299		73	70	39	14	32	545	80	4	346	763	62	**2431**
5:00 PM	5:15 PM		76	58	397		102	91	48	16	46	716	99	5	490	903	67	**3114**
5:15 PM	5:30 PM		96	66	498		117	106	54	20	55	883	117	7	640	1115	77	**3851**
5:30 PM	5:45 PM		108	77	581		130	116	62	20	61	1024	139	7	745	1274	83	**4427**
5:45 PM	6:00 PM		125	83	692		146	129	67	23	71	1136	145	7	815	1406	95	**4940**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	16	12	57	0	23	16	9	1	10	137	24	1	77	159	12	**558**
4:15 PM	4:30 PM	0	12	12	81	0	15	17	13	2	6	110	17	1	103	194	23	**606**
4:30 PM	4:45 PM	0	18	8	69	0	14	24	6	2	5	116	19	2	96	178	12	**569**
4:45 PM	5:00 PM	0	12	14	92	0	21	13	11	5	11	182	20	0	70	232	15	**698**
5:00 PM	5:15 PM	0	18	12	98	0	29	21	9	2	14	171	19	1	144	140	5	**683**
5:15 PM	5:30 PM	0	20	8	101	0	15	15	6	4	9	167	18	2	150	212	10	**737**
5:30 PM	5:45 PM	0	12	11	83	0	13	10	8	0	6	141	22	0	105	159	6	**576**
5:45 PM	6:00 PM	0	17	6	111	0	16	13	5	3	10	112	6	0	70	132	12	**513**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	58	46	299	0	73	70	39	14	32	545	80	4	346	763	62	**2431**
4:15 PM	5:15 PM	0	60	46	340	0	79	75	39	11	36	579	75	4	413	744	55	**2556**
4:30 PM	5:30 PM	0	68	42	360	0	79	73	32	13	39	636	76	5	460	762	42	**2687**
4:45 PM	5:45 PM	0	62	45	374	0	78	59	34	11	40	661	79	3	469	743	36	**2694**
5:00 PM	6:00 PM	0	67	37	393	0	73	59	28	9	39	591	65	3	469	643	33	**2509**

PEAK HOUR SUMMARY

4:45 PM to 5:45 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	62	45	374	0	78	59	34	11	40	661	79	3	469	743	36	**2694**
PHF BY MOVEMENT	0.00	0.78	0.80	0.93	0.00	0.67	0.70	0.77	0.55	0.71	0.91	0.90	0.38	0.78	0.80	0.60	OVERALL
PHF BY APPROACH	0.93				0.72				0.91				0.84				0.91
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	7		11		19		8		29		46		52		42		**107**
TRUCK PERCENTAGE	1.5%		9.1%		11.1%		1.3%		3.7%		4.1%		4.2%		4.9%		**4.0%**
BICYCLE	0				0				0				1				**1**
PEDESTRIAN BY DIR:	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				0				**0**

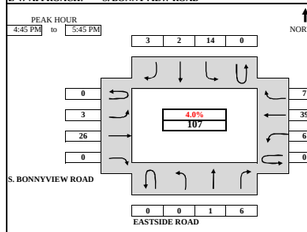
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

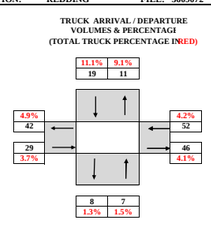
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: EASTSIDE ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:45 PM to 5:45 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE INCED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0	2		3	0	0		0	5	2		4	18	3	**37**
4:15 PM	4:30 PM		0	0	3		6	0	0		0	10	2		4	25	11	**61**
4:30 PM	4:45 PM		0	1	4		8	0	2		0	10	2		5	32	13	**77**
4:45 PM	5:00 PM		0	1	5		12	0	2		2	14	2		6	43	15	**102**
5:00 PM	5:15 PM		0	1	8		16	1	4		2	21	2		7	53	17	**132**
5:15 PM	5:30 PM		0	1	10		18	2	5		2	33	2		9	60	19	**161**
5:30 PM	5:45 PM		0	2	10		22	2	5		3	36	2		11	71	20	**184**
5:45 PM	6:00 PM		0	2	11		27	2	6		4	41	2		11	80	21	**207**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	2	0	3	0	0	0	0	5	2	0	4	18	3	**37**
4:15 PM	4:30 PM	0	0	0	1	0	3	0	0	0	0	5	0	0	0	7	8	**24**
4:30 PM	4:45 PM	0	0	1	1	0	2	0	2	0	0	0	0	0	1	7	2	**16**
4:45 PM	5:00 PM	0	0	0	1	0	4	0	0	0	2	4	0	0	1	11	2	**25**
5:00 PM	5:15 PM	0	0	0	3	0	4	1	2	0	0	7	0	0	1	10	2	**30**
5:15 PM	5:30 PM	0	0	0	2	0	2	1	1	0	0	12	0	0	2	7	2	**29**
5:30 PM	5:45 PM	0	0	1	0	0	4	0	0	0	1	3	0	0	2	11	1	**23**
5:45 PM	6:00 PM	0	0	0	1	0	5	0	1	0	1	5	0	0	0	9	1	**23**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	1	5	0	12	0	2	0	2	14	2	0	6	43	15	**102**
4:15 PM	5:15 PM	0	0	1	6	0	13	1	4	0	2	16	0	0	3	35	14	**95**
4:30 PM	5:30 PM	0	0	1	7	0	12	2	5	0	2	23	0	0	5	35	8	**100**
4:45 PM	5:45 PM	0	0	1	6	0	14	2	3	0	3	26	0	0	6	39	7	**107**
5:00 PM	6:00 PM	0	0	1	6	0	15	2	4	0	2	27	0	0	5	37	6	**105**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

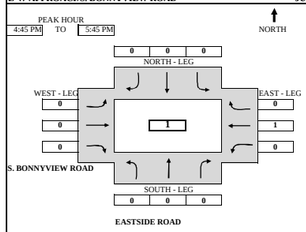
4:45 PM to 5:45 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	7	11	19	8	29	46	52	42	107
TRUCK PERCENTAGE	1.5%	9.1%	11.1%	1.3%	3.7%	4.1%	4.2%	4.9%	4.0%

B.A.Y.M.E.T.R.I.C.S.

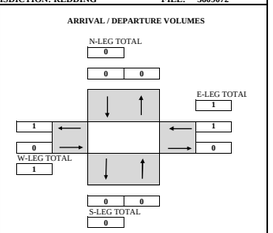
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: EASTSIDE ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:45 PM to 5:45 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	**2**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	**2**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	**2**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	**2**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	**1**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

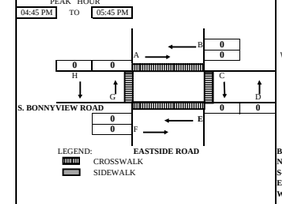
4:45 PM to 5:45 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	1	**1**

B.A.Y.M.E.T.R.I.C.S.

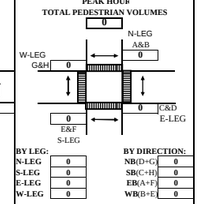
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: EASTSIDE ROAD — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:45 PM to 05:45 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:	
N-LEG	0
S-LEG	0
E-LEG	0
W-LEG	0

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	0
EB(A+F)	0
WB(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	1	0	0	0	0	0	1	0	***2***
04:45 PM	05:00 PM	1	0	0	0	0	0	1	0	***2***
05:00 PM	05:15 PM	1	0	0	0	0	0	1	0	***2***
05:15 PM	05:30 PM	1	0	0	0	0	0	1	0	***2***
05:30 PM	05:45 PM	1	0	0	0	0	0	1	0	***2***
05:45 PM	06:00 PM	1	0	0	0	0	0	1	0	***2***
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	1	0	0	0	0	0	1	0	***2***
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	05:45 PM	1	0	0	0	0	0	1	0	***2***
05:45 PM	06:00 PM	1	0	0	0	0	0	1	0	***2***
HOURLY TOTALS										
04:00 PM	05:00 PM	1	0	0	0	0	0	1	0	***2***
04:15 PM	05:15 PM	1	0	0	0	0	0	1	0	***2***
04:30 PM	05:30 PM	1	0	0	0	0	0	1	0	***2***
04:45 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	06:00 PM	0	0	0	0	0	0	0	0	***0***

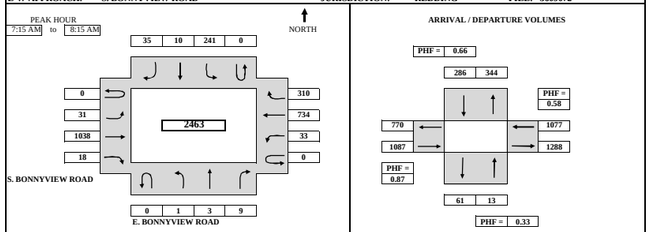
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

4:45 PM to 5:45 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: E. BONNYVIEW ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0	0	0		35	1	6		7	178	0		0	142	37	**406**
7:15 AM	7:30 AM		0	1	0		87	4	15		20	461	3		6	313	105	**1015**
7:30 AM	7:45 AM		0	2	0		179	8	28		29	762	6		8	409	182	**1613**
7:45 AM	8:00 AM		0	2	1		208	10	38		35	1009	8		18	742	303	**2374**
8:00 AM	8:15 AM		1	3	9		276	11	41		38	1216	18		33	876	347	**2869**
8:15 AM	8:30 AM		12	9	29		316	16	48		41	1397	35		58	1044	372	**3377**
8:30 AM	8:45 AM		19	12	42		351	17	53		48	1597	38		59	1195	409	**3840**
8:45 AM	9:00 AM		20	12	45		389	18	63		54	1804	40		59	1342	442	**4288**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	35	1	6	0	7	178	0	0	0	142	37	**406**
7:15 AM	7:30 AM	0	0	1	0	0	52	3	9	0	13	283	3	0	6	171	68	**609**
7:30 AM	7:45 AM	0	0	1	0	0	92	4	13	0	9	301	3	0	2	96	77	**598**
7:45 AM	8:00 AM	0	0	0	1	0	29	2	10	0	6	247	2	0	10	333	121	**761**
8:00 AM	8:15 AM	0	1	1	8	0	68	1	3	0	3	207	10	0	15	134	44	**495**
8:15 AM	8:30 AM	0	11	6	20	0	40	5	7	0	3	181	17	0	25	168	25	**508**
8:30 AM	8:45 AM	0	7	3	13	0	35	1	5	0	7	200	3	0	1	151	37	**463**
8:45 AM	9:00 AM	0	1	0	3	0	38	1	10	0	6	207	2	0	0	147	33	**448**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	2	1	0	208	10	38	0	35	1009	8	0	18	742	303	**2374**
7:15 AM	8:15 AM	0	1	3	9	0	241	10	35	0	31	1038	18	0	33	734	310	**2463**
7:30 AM	8:30 AM	0	12	8	29	0	229	12	33	0	21	936	32	0	52	731	267	**2362**
7:45 AM	8:45 AM	0	19	10	42	0	172	9	25	0	19	835	32	0	51	786	227	**2227**
8:00 AM	9:00 AM	0	20	10	44	0	181	8	25	0	19	795	32	0	41	600	139	**1914**

7:15 AM to 8:15 AM

PEAK HOUR SUMMARY

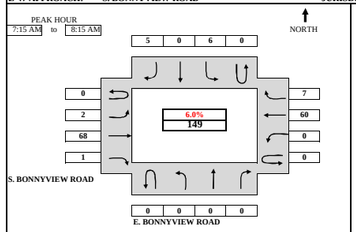
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	1	3	9	0	241	10	35	0	31	1038	18	0	33	734	310	**2463**
PHF BY MOVEMENT	0.00	0.25	0.75	0.28	0.00	0.65	0.63	0.67	0.00	0.60	0.86	0.45	0.00	0.55	0.55	0.64	OVERALL
PHF BY APPROACH	0.33				0.66				0.87				0.58				0.81
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		9		11		1		71		74		67		65		**149**
TRUCK PERCENTAGE	0.0%		2.6%		3.8%		1.6%		6.5%		5.7%		6.2%		8.4%		**6.0%**
BICYCLE	0				1				1				1				**3**
PEDESTRIAN BY DIR:	0				0				1				2				**3**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	3				0				0				0				**3**

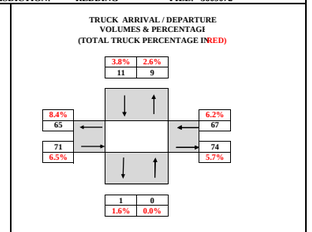
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: E. BONNYVIEW ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0				2	1			2	13	0		8	1		**27**
7:15 AM	7:30 AM		0				2	1			3	29	0		17	2		**54**
7:30 AM	7:45 AM		0				4	3			4	51	0		34	3		**99**
7:45 AM	8:00 AM		0				7	6			4	67	0		57	6		**147**
8:00 AM	8:15 AM		0				8	6			4	81	1		68	8		**176**
8:15 AM	8:30 AM		1				9	7			4	99	1		84	8		**213**
8:30 AM	8:45 AM		1				10	8			4	113	1		101	9		**247**
8:45 AM	9:00 AM		1				10	10			4	132	1		118	11		**287**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	2	0	1	0	2	13	0	0	8	1		**27**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	1	16	0	0	9	1		**27**
7:30 AM	7:45 AM	0	0	0	0	0	2	0	2	0	1	22	0	0	17	1		**45**
7:45 AM	8:00 AM	0	0	0	0	0	3	0	3	0	0	16	0	0	23	3		**48**
8:00 AM	8:15 AM	0	0	0	0	0	1	0	0	0	0	14	1	0	11	2		**29**
8:15 AM	8:30 AM	0	0	1	0	0	1	0	1	0	0	18	0	0	16	0		**37**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	1	0	0	14	0	0	17	1		**34**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	2	0	0	19	0	0	17	2		**40**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	7	0	6	0	4	67	0	0	57	6		**147**
7:15 AM	8:15 AM	0	0	0	0	0	6	0	5	0	2	68	1	0	60	7		**149**
7:30 AM	8:30 AM	0	0	1	0	0	7	0	6	0	1	70	1	0	67	6		**159**
7:45 AM	8:45 AM	0	0	1	0	0	6	0	5	0	0	62	1	0	67	6		**148**
8:00 AM	9:00 AM	0	0	1	0	0	3	0	4	0	0	65	1	0	61	5		**140**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

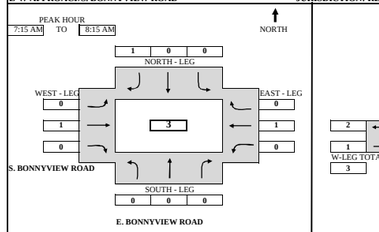
7:15 AM to 8:15 AM

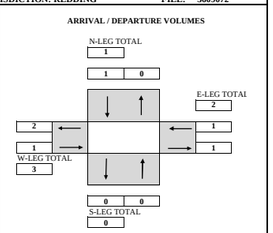
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	9	11	1	71	74	67	65	149
TRUCK PERCENTAGE	0.0%	2.6%	3.8%	1.6%	6.5%	5.7%	6.2%	8.4%	6.0%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: E. BONNYVIEW ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	7:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	**2**
7:45 AM	8:00 AM	0	0	0	0	0	1	0	1	0	0	1	0	**3**
8:00 AM	8:15 AM	0	0	0	0	0	1	0	1	0	0	1	0	**3**
8:15 AM	8:30 AM	0	0	0	0	0	1	0	1	0	0	1	2	**5**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	1	0	0	3	2	**7**
8:45 AM	9:00 AM	0	0	0	0	0	1	0	1	0	0	3	2	**7**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
7:30 AM	7:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	**1**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	**2**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	**2**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	1	0	1	0	0	1	0	**3**
7:15 AM	8:15 AM	0	0	0	0	0	1	0	1	0	0	1	0	**3**
7:30 AM	8:30 AM	0	0	0	0	0	1	0	1	0	0	1	2	**4**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	3	2	**5**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	2	2	**4**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

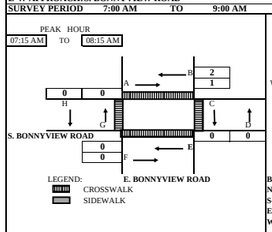
7:15 AM to 8:15 AM

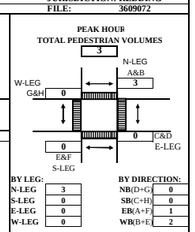
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	1	1	1	**3**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016
N-S APPROACH: E. BONNYVIEW ROAD **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM **TO** 9:00 AM **FILE:** 3609072





BY LEG:	
N-LEG	3
S-LEG	0
E-LEG	0
W-LEG	0

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	0
EB(A+F)	1
WB(B+E)	2

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	1	0	0	0	0	0	0	***1***
07:30 AM	--- 07:45 AM	0	1	0	0	0	0	0	0	***1***
07:45 AM	--- 08:00 AM	1	2	0	0	0	0	0	0	***3***
08:00 AM	--- 08:15 AM	1	2	0	0	0	0	0	0	***3***
08:15 AM	--- 08:30 AM	1	2	0	0	0	0	0	0	***3***
08:30 AM	--- 08:45 AM	1	2	0	0	0	0	0	0	***3***
08:45 AM	--- 09:00 AM	1	2	0	0	0	0	0	0	***3***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	1	0	0	0	0	0	0	***1***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	1	1	0	0	0	0	0	0	***2***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	1	2	0	0	0	0	0	0	***3***
07:15 AM	--- 08:15 AM	1	2	0	0	0	0	0	0	***3***
07:30 AM	--- 08:30 AM	1	1	0	0	0	0	0	0	***2***
07:45 AM	--- 08:45 AM	1	1	0	0	0	0	0	0	***2***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 Fax: (510) 232-1272

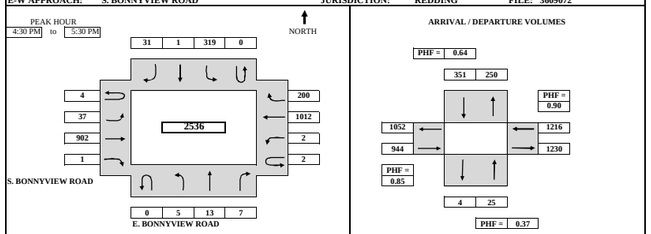
7:15 AM to 8:15 AM

VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	1	2	**3**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	3	0	0	0	**3**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: E. BONNYVIEW ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	2	1		46	0	12	1	6	216	1	0	0	221	46	**552**
4:15 PM	4:30 PM		0	2	4		81	0	24	1	11	396	1	0	1	465	93	**1079**
4:30 PM	4:45 PM		3	12	8		142	1	32	2	20	610	1	0	1	707	140	**1679**
4:45 PM	5:00 PM		3	12	9		203	1	39	2	26	804	1	2	3	973	178	**2256**
5:00 PM	5:15 PM		5	13	11		335	1	45	4	36	1069	1	2	3	1204	228	**2957**
5:15 PM	5:30 PM		5	15	11		400	1	55	5	48	1298	2	2	3	1477	293	**3615**
5:30 PM	5:45 PM		5	16	12		449	2	60	6	56	1528	2	2	3	1719	340	**4200**
5:45 PM	6:00 PM		5	17	12		488	2	69	7	61	1704	2	2	3	1898	377	**4647**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	2	1	0	46	0	12	1	6	216	1	0	0	221	46	**552**
4:15 PM	4:30 PM	0	0	0	3	0	35	0	12	0	5	180	0	0	1	244	47	**527**
4:30 PM	4:45 PM	0	3	10	4	0	61	1	8	1	9	214	0	0	0	242	47	**600**
4:45 PM	5:00 PM	0	0	0	1	0	61	0	7	0	6	194	0	2	2	266	38	**577**
5:00 PM	5:15 PM	0	2	1	2	0	132	0	6	2	10	265	0	0	0	231	50	**701**
5:15 PM	5:30 PM	0	0	2	0	0	65	0	10	1	12	229	1	0	0	273	65	**658**
5:30 PM	5:45 PM	0	0	1	1	0	49	1	5	1	8	230	0	0	0	242	47	**585**
5:45 PM	6:00 PM	0	0	1	0	0	39	0	9	1	5	176	0	0	0	179	37	**447**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	3	12	9	0	203	1	39	2	26	804	1	2	3	973	178	**2256**
4:15 PM	5:15 PM	0	5	11	10	0	289	1	33	3	30	853	0	2	3	983	182	**2405**
4:30 PM	5:30 PM	0	5	13	7	0	319	1	31	4	37	902	1	2	2	1012	200	**2536**
4:45 PM	5:45 PM	0	2	4	4	0	307	1	28	4	36	918	1	2	2	1012	200	**2521**
5:00 PM	6:00 PM	0	2	5	3	0	285	1	30	5	35	900	1	0	0	925	199	**2391**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	5	13	7	0	319	1	31	4	37	902	1	2	2	1012	200	**2536**
PHF BY MOVEMENT	0.00	0.42	0.33	0.44	0.00	0.60	0.25	0.78	0.50	0.77	0.85	0.25	0.25	0.25	0.93	0.77	OVERALL
PHF BY APPROACH	0.37				0.64				0.85				0.90				0.90
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		2		4		0		37		39		46		46		**87**
TRUCK PERCENTAGE	0.0%		0.8%		1.1%		0.0%		3.9%		3.2%		3.8%		4.4%		**3.4%**
BICYCLE	0				0				0				1				**1**
PEDESTRIAN BY DIR:	1				0				1				0				**2**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	1				0				1				0				**2**

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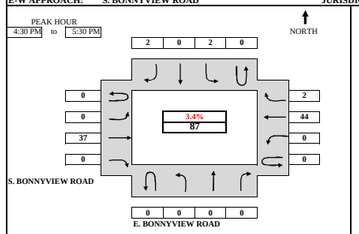
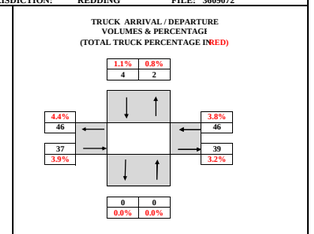
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: E. BONNYVIEW ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						1	2			1	9			12	1		**26**
4:15 PM	4:30 PM						2	2			1	17			28	3		**53**
4:30 PM	4:45 PM						3	3			1	22			42	4		**75**
4:45 PM	5:00 PM						3	4			1	30			52	5		**95**
5:00 PM	5:15 PM						3	4			1	44			59	5		**116**
5:15 PM	5:30 PM						4	4			1	54			72	5		**140**
5:30 PM	5:45 PM						5	5			1	60			82	5		**158**
5:45 PM	6:00 PM						5	5			1	68			88	5		**172**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	1	0	2	0	1	9	0	0	0	12	1	**26**
4:15 PM	4:30 PM	0	0	0	0	0	1	0	0	0	0	8	0	0	0	16	2	**27**
4:30 PM	4:45 PM	0	0	0	0	0	1	0	1	0	0	5	0	0	0	14	1	**22**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	1	0	0	8	0	0	0	10	1	**20**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	14	0	0	0	7	0	**21**
5:15 PM	5:30 PM	0	0	0	0	0	1	0	0	0	0	10	0	0	0	13	0	**24**
5:30 PM	5:45 PM	0	0	0	0	0	1	0	1	0	0	6	0	0	0	10	0	**18**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	6	0	**14**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	3	0	4	0	1	30	0	0	0	52	5	**95**
4:15 PM	5:15 PM	0	0	0	0	0	2	0	2	0	0	35	0	0	0	47	4	**90**
4:30 PM	5:30 PM	0	0	0	0	0	2	0	2	0	0	37	0	0	0	44	2	**87**
4:45 PM	5:45 PM	0	0	0	0	0	2	0	2	0	0	38	0	0	0	40	1	**83**
5:00 PM	6:00 PM	0	0	0	0	0	2	0	1	0	0	38	0	0	0	36	0	**77**

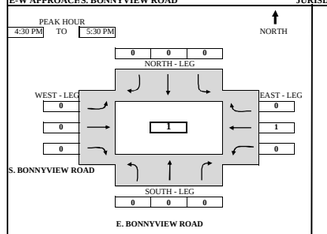
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

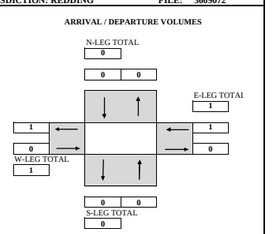
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	2	4	0	37	39	46	46	**87**
TRUCK PERCENTAGE	0.0%	0.8%	1.1%	0.0%	3.9%	3.2%	3.8%	4.4%	**3.4%**

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: E. BONNYVIEW ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	**2**
5:15 PM	5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	**2**
5:30 PM	5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	**2**
5:45 PM	6:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	**2**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	**1**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	**1**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	**1**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	**1**

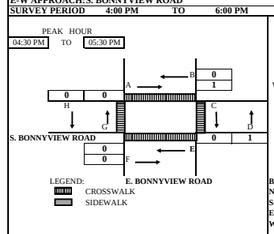
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

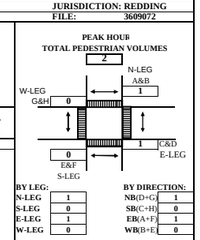
4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	1	**1**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: E. BONNYVIEW ROAD — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





BY LEG:

N-LEG	1
S-LEG	0
E-LEG	1
W-LEG	0

BY DIRECTION:

NB(D+G)	1
SB(C+H)	0
EB(A+F)	1
WB(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	1	0	0	0	0	0	0	0	***1***
04:45 PM	05:00 PM	1	0	0	0	0	0	0	0	***1***
05:00 PM	05:15 PM	1	0	0	1	0	0	0	0	***2***
05:15 PM	05:30 PM	1	0	0	1	0	0	0	0	***2***
05:30 PM	05:45 PM	1	0	0	1	0	0	0	0	***2***
05:45 PM	06:00 PM	1	2	0	1	0	0	0	0	***4***
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	1	0	0	0	0	0	0	0	***1***
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	05:15 PM	0	0	0	1	0	0	0	0	***1***
05:15 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	06:00 PM	0	2	0	0	0	0	0	0	***2***
HOURLY TOTALS										
04:00 PM	05:00 PM	1	0	0	0	0	0	0	0	***1***
04:15 PM	05:15 PM	1	0	0	1	0	0	0	0	***2***
04:30 PM	05:30 PM	1	0	0	1	0	0	0	0	***2***
04:45 PM	05:45 PM	0	0	0	1	0	0	0	0	***1***
05:00 PM	06:00 PM	0	2	0	1	0	0	0	0	***3***

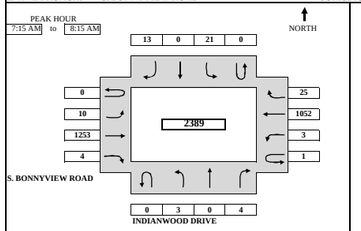
Tel : (510) 232-1271 Fax: (510) 232-1272

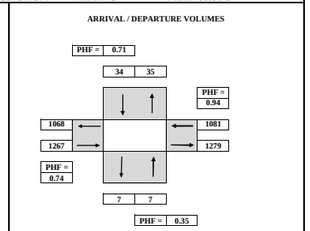
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	1	0	1	0	**2**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	1	0	1	0	**2**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: INDIANWOOD DRIVE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		1	0		10	3			1	1	226	0	0	1	183	7	**433**
7:15 AM	7:30 AM		1	0		13	9			1	3	523	2	0	2	413	20	**987**
7:30 AM	7:45 AM		4	2		21	13			1	7	944	3	0	4	684	27	**1710**
7:45 AM	8:00 AM		4	4		25	15			1	11	1240	4	0	4	969	31	**2308**
8:00 AM	8:15 AM		4	4		31	16			1	11	1479	4	1	4	1235	32	**2822**
8:15 AM	8:30 AM		5	6		33	17			1	13	1730	5	2	11	1461	43	**3327**
8:30 AM	8:45 AM		6	9		39	20			1	15	1952	8	2	18	1658	48	**3776**
8:45 AM	9:00 AM		9	15		43	23			1	17	2207	8	2	23	1827	52	**4227**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	1	0	0	0	10	0	3	1	1	226	0	0	1	183	7	**433**
7:15 AM	7:30 AM	0	0	0	0	0	3	0	6	0	2	297	2	0	1	230	13	**554**
7:30 AM	7:45 AM	0	3	0	2	0	8	0	4	0	4	421	1	0	2	271	7	**723**
7:45 AM	8:00 AM	0	0	0	2	0	4	0	2	0	4	296	1	0	0	285	4	**598**
8:00 AM	8:15 AM	0	0	0	0	0	6	0	1	0	0	239	0	1	0	266	1	**514**
8:15 AM	8:30 AM	0	1	0	2	0	2	0	1	0	2	251	1	1	7	226	11	**505**
8:30 AM	8:45 AM	0	1	0	3	0	6	0	3	0	2	222	3	0	7	197	5	**449**
8:45 AM	9:00 AM	0	3	0	6	0	4	0	3	0	2	255	0	0	5	169	4	**451**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	4	0	4	0	25	0	15	1	11	1240	4	0	4	969	31	**2308**
7:15 AM	8:15 AM	0	3	0	4	0	21	0	13	0	10	1253	4	1	3	1052	25	**2389**
7:30 AM	8:30 AM	0	4	0	6	0	20	0	8	0	10	1207	3	2	9	1048	23	**2340**
7:45 AM	8:45 AM	0	2	0	7	0	18	0	7	0	8	1008	5	2	14	974	21	**2066**
8:00 AM	9:00 AM	0	5	0	11	0	18	0	8	0	6	967	4	2	19	858	21	**1919**

PEAK HOUR SUMMARY

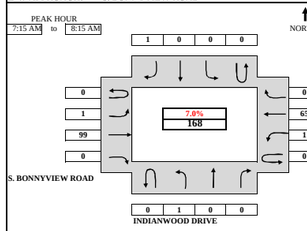
7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	3	0	4	0	21	0	13	0	10	1253	4	1	3	1052	25	**2389**
PHF BY MOVEMENT	0.00	0.25	0.00	0.50	0.00	0.66	0.00	0.54	0.00	0.63	0.74	0.50	0.25	0.38	0.92	0.48	OVERALL
PHF BY APPROACH	0.35				0.71				0.74				0.94				0.83
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	1		1		1		1		100		99		66		67		**168**
TRUCK PERCENTAGE	14.3%		2.9%		2.9%		14.3%		7.9%		7.7%		6.1%		6.3%		**7.0%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				0				1				1				**2**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	1				0				0				0				**2**

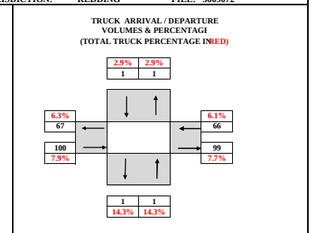
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: INDIANWOOD DRIVE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0	0		0	1			0	21	0		0	11	1		**34**
7:15 AM	7:30 AM		0	0		0	1			0	41	0		0	22	1		**65**
7:30 AM	7:45 AM		1	0		0	1			0	75	0		1	37	1		**116**
7:45 AM	8:00 AM		1	0		0	2			1	93	0		1	54	1		**153**
8:00 AM	8:15 AM		1	0		0	2			1	120	0		1	76	1		**202**
8:15 AM	8:30 AM		1	0		0	2			1	144	0		3	100	1		**252**
8:30 AM	8:45 AM		1	0		0	2			2	161	0		5	121	2		**294**
8:45 AM	9:00 AM		1	1		0	2			2	181	0		7	137	3		**334**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	1	0	0	21	0	0	0	11	1	**34**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	20	0	0	0	11	0	**31**
7:30 AM	7:45 AM	0	1	0	0	0	0	0	0	0	0	34	0	0	1	15	0	**51**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	1	0	1	18	0	0	0	17	0	**37**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	27	0	0	0	22	0	**49**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	24	0	0	2	24	0	**50**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	1	17	0	0	2	21	1	**42**
8:45 AM	9:00 AM	0	0	0	1	0	0	0	0	0	0	20	0	0	2	16	1	**40**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	1	0	0	0	0	0	2	0	1	93	0	0	1	54	1	**153**
7:15 AM	8:15 AM	0	1	0	0	0	0	0	1	0	1	99	0	0	1	65	0	**168**
7:30 AM	8:30 AM	0	1	0	0	0	0	0	1	0	1	103	0	0	3	78	0	**187**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	1	0	2	86	0	0	4	84	1	**178**
8:00 AM	9:00 AM	0	0	0	1	0	0	0	0	0	1	88	0	0	6	83	2	**181**

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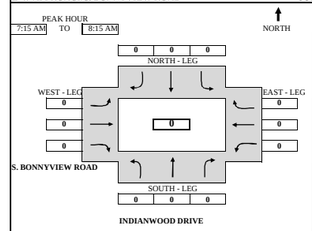
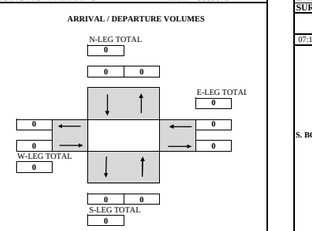
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	1	1	1	1	100	99	66	67	168
TRUCK PERCENTAGE	14.3%	2.9%	2.9%	14.3%	7.9%	7.7%	6.1%	6.3%	7.0%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: INDIANWOOD DRIVE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

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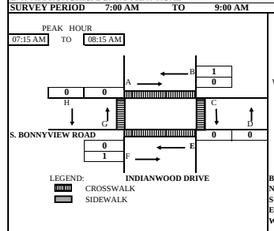
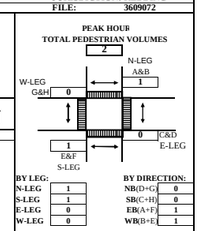
7:15 AM to 8:15 AM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH	0	0	0	0	**0**
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: INDIANWOOD DRIVE — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	1	0	0	***1***
07:30 AM	--- 07:45 AM	0	1	0	0	0	1	0	0	***2***
07:45 AM	--- 08:00 AM	0	1	0	0	0	1	0	0	***2***
08:00 AM	--- 08:15 AM	0	1	0	0	0	1	0	0	***2***
08:15 AM	--- 08:30 AM	0	4	0	0	0	1	0	0	***5***
08:30 AM	--- 08:45 AM	0	4	0	0	0	1	0	1	***6***
08:45 AM	--- 09:00 AM	0	4	0	0	0	1	0	1	***6***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	1	0	0	***1***
07:30 AM	--- 07:45 AM	0	1	0	0	0	0	0	0	***1***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	3	0	0	0	0	0	0	***3***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	1	***1***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	1	0	0	0	1	0	0	***2***
07:15 AM	--- 08:15 AM	0	1	0	0	0	1	0	0	***2***
07:30 AM	--- 08:30 AM	0	4	0	0	0	0	0	0	***4***
07:45 AM	--- 08:45 AM	0	3	0	0	0	0	0	1	***4***
08:00 AM	--- 09:00 AM	0	3	0	0	0	0	0	1	***4***

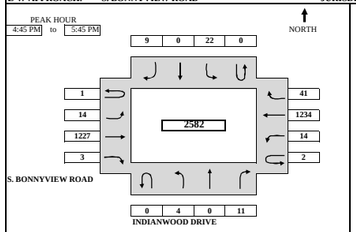
Tel : (510) 232-1271 Fax: (510) 232-1272

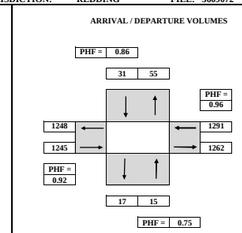
7:15 AM to 8:15 AM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION	0	0	1	1	**2**
PEDESTRIAN					
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	1	1	0	0	**2**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: INDIANWOOD DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		1	2		6	2			0	1	269	4	0	3	270	9	**567**
4:15 PM	4:30 PM		3	3		10	2			0	2	464	5	0	4	537	14	**1044**
4:30 PM	4:45 PM		4	6		13	3			0	6	711	6	1	11	812	19	**1592**
4:45 PM	5:00 PM		6	9		15	6			0	9	1014	7	2	15	1128	28	**2239**
5:00 PM	5:15 PM		6	14		23	7			0	12	1349	8	3	20	1422	41	**2905**
5:15 PM	5:30 PM		7	17		30	9			0	15	1662	8	3	21	1746	52	**3570**
5:30 PM	5:45 PM		8	17		35	12			1	20	1938	9	3	25	2046	60	**4174**
5:45 PM	6:00 PM		9	21		40	14			1	21	2104	10	3	27	2260	64	**4574**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	1	0	2	0	6	0	2	0	1	269	4	0	3	270	9	**567**
4:15 PM	4:30 PM	0	2	0	1	0	4	0	0	0	1	195	1	0	1	267	5	**477**
4:30 PM	4:45 PM	0	1	0	3	0	3	0	1	0	4	247	1	1	7	275	5	**548**
4:45 PM	5:00 PM	0	2	0	3	0	2	0	3	0	3	303	1	1	4	316	9	**647**
5:00 PM	5:15 PM	0	0	0	5	0	8	0	1	0	3	335	1	1	5	294	13	**666**
5:15 PM	5:30 PM	0	1	0	3	0	7	0	2	0	3	313	0	0	1	324	11	**665**
5:30 PM	5:45 PM	0	1	0	4	0	5	0	3	1	5	276	1	0	4	300	8	**604**
5:45 PM	6:00 PM	0	1	0	4	0	5	0	2	0	1	166	1	0	2	214	4	**400**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	6	0	9	0	15	0	6	0	9	1014	7	2	15	1128	28	**2239**
4:15 PM	5:15 PM	0	5	0	12	0	17	0	5	0	11	1080	4	3	17	1152	32	**2338**
4:30 PM	5:30 PM	0	4	0	14	0	20	0	7	0	13	1198	3	3	17	1209	38	**2526**
4:45 PM	5:45 PM	0	4	0	11	0	22	0	9	1	14	1227	3	2	14	1234	41	**2582**
5:00 PM	6:00 PM	0	3	0	12	0	25	0	8	1	12	1090	3	1	12	1132	36	**2335**

PEAK HOUR SUMMARY

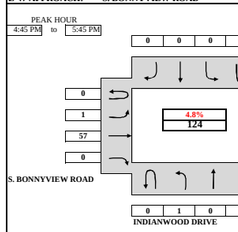
4:45 PM to 5:45 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	4	0	11	0	22	0	9	1	14	1227	3	2	14	1234	41	**2582**
PHF BY MOVEMENT	0.00	0.50	0.00	0.55	0.00	0.69	0.00	0.75	0.25	0.70	0.92	0.75	0.50	0.70	0.95	0.79	OVERALL
PHF BY APPROACH	0.75				0.86				0.92				0.96				0.97
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	2		3		0		3		58		58		64		60		**124**
TRUCK PERCENTAGE	13.3%		5.5%		0.0%		17.6%		4.7%		4.6%		5.0%		4.8%		**4.8%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	3				3				3				2				**11**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	4				1				4				2				**11**

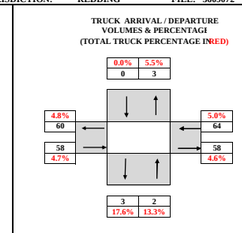
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: INDIANWOOD DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0		0	1			0	18	0		0	28	0		**47**
4:15 PM	4:30 PM		0	0		0	1			0	28	0		0	44	0		**73**
4:30 PM	4:45 PM		0	1		0	1			0	37	1		1	59	0		**100**
4:45 PM	5:00 PM		1	1		0	1			0	53	1		3	75	0		**135**
5:00 PM	5:15 PM		1	2		0	1			1	68	1		4	86	2		**166**
5:15 PM	5:30 PM		1	2		0	1			1	85	1		4	104	2		**201**
5:30 PM	5:45 PM		1	2		0	1			1	94	1		4	118	2		**224**
5:45 PM	6:00 PM		1	2		0	1			1	109	1		4	125	2		**247**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	1	0	0	18	0	0	0	28	0	**47**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	16	0	**26**
4:30 PM	4:45 PM	0	0	0	1	0	0	0	1	0	0	9	1	0	1	15	0	**27**
4:45 PM	5:00 PM	0	1	0	0	0	0	0	0	0	0	16	0	0	2	16	0	**35**
5:00 PM	5:15 PM	0	0	0	1	0	0	0	0	0	1	15	0	0	1	11	2	**31**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	17	0	0	0	18	0	**35**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	14	0	**23**
5:45 PM	6:00 PM	0	0	0	0	0	1	0	0	0	0	15	0	0	0	7	0	**23**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	1	0	1	0	0	0	1	0	0	53	1	0	3	75	0	**135**
4:15 PM	5:15 PM	0	1	0	2	0	0	0	0	0	0	50	1	0	4	58	2	**119**
4:30 PM	5:30 PM	0	1	0	2	0	0	0	0	0	1	57	1	0	4	60	2	**128**
4:45 PM	5:45 PM	0	1	0	1	0	0	0	0	0	1	57	0	0	3	59	2	**124**
5:00 PM	6:00 PM	0	0	0	1	0	1	0	0	0	1	56	0	0	1	50	2	**112**

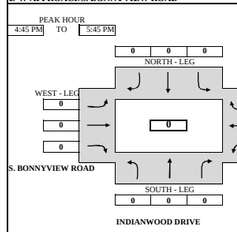
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

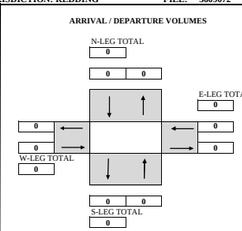
4:45 PM to 5:45 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	2	3	0	3	58	58	64	60	124
TRUCK PERCENTAGE	13.3%	5.5%	0.0%	17.6%	4.7%	4.6%	5.0%	4.8%	4.8%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: INDIANWOOD DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

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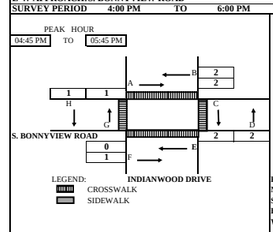
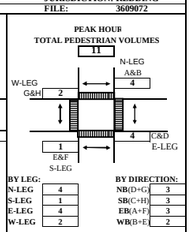
4:45 PM to 5:45 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH	0	0	0	0	**0**
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: INDIANWOOD DRIVE — **DAY:** TUESDAY
E-W APPROACHES: BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK	EAST X-WALK			SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	1	0	0	***1***
04:30 PM	--- 04:45 PM	0	1	0	0	0	1	0	0	***2***
04:45 PM	--- 05:00 PM	0	1	2	0	0	2	0	1	***6***
05:00 PM	--- 05:15 PM	2	3	2	0	0	2	0	1	***10***
05:15 PM	--- 05:30 PM	2	3	2	2	0	2	0	1	***12***
05:30 PM	--- 05:45 PM	2	3	2	2	0	2	1	1	***13***
05:45 PM	--- 06:00 PM	2	3	2	2	0	2	1	1	***13***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	1	0	0	***1***
04:30 PM	--- 04:45 PM	0	1	0	0	0	1	0	0	***1***
04:45 PM	--- 05:00 PM	0	0	2	0	0	1	0	1	***4***
05:00 PM	--- 05:15 PM	2	2	0	0	0	0	0	0	***4***
05:15 PM	--- 05:30 PM	0	0	0	2	0	0	0	0	***2***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	1	0	***1***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	1	2	0	0	2	0	1	***6***
04:15 PM	--- 05:15 PM	2	3	2	0	0	2	0	1	***10***
04:30 PM	--- 05:30 PM	2	3	2	2	0	1	0	1	***11***
04:45 PM	--- 05:45 PM	2	2	2	2	0	1	1	1	***11***
05:00 PM	--- 06:00 PM	2	2	0	2	0	0	1	0	***7***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

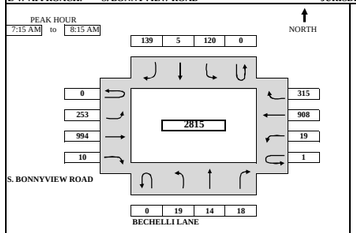
4:45 PM to 5:45 PM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION	4	4	4	3	**15**
PEDESTRIAN	3	3	3	2	**11**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	4	1	4	2	**11**

B.A.Y.M.E.T.R.I.C.S.

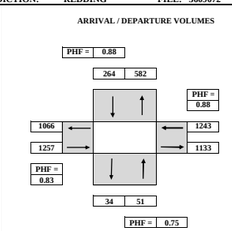
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		3	1	2		25	2	19		25	187	0	0	2	167	29	**462**
7:15 AM	7:30 AM		6	2	5		47	4	40		92	434	1	1	4	360	93	**1089**
7:30 AM	7:45 AM		10	5	11		84	4	77		151	753	1	1	9	604	180	**1890**
7:45 AM	8:00 AM		19	9	15		116	5	119		244	998	6	1	17	855	273	**2677**
8:00 AM	8:15 AM		22	15	20		145	7	158		278	1181	10	1	21	1075	344	**3277**
8:15 AM	8:30 AM		26	17	22		164	10	196		325	1380	12	2	24	1273	381	**3832**
8:30 AM	8:45 AM		28	20	25		191	10	222		380	1601	12	2	26	1426	410	**4353**
8:45 AM	9:00 AM		30	21	28		211	11	251		418	1793	17	2	28	1597	450	**4857**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	3	1	2	0	25	2	19	0	25	187	0	0	2	167	29	**462**
7:15 AM	7:30 AM	0	3	1	3	0	22	2	21	0	67	247	1	1	2	193	64	**627**
7:30 AM	7:45 AM	0	4	3	6	0	37	0	37	0	59	319	0	0	5	244	87	**801**
7:45 AM	8:00 AM	0	9	4	4	0	32	1	42	0	93	245	5	0	8	251	93	**787**
8:00 AM	8:15 AM	0	3	6	5	0	29	2	39	0	34	183	4	0	4	220	71	**600**
8:15 AM	8:30 AM	0	4	2	2	0	19	3	38	0	47	199	2	1	3	198	37	**555**
8:30 AM	8:45 AM	0	2	3	3	0	27	0	26	0	55	221	0	0	2	153	29	**521**
8:45 AM	9:00 AM	0	2	1	3	0	20	1	29	0	38	192	5	0	2	171	40	**504**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	19	9	15	0	116	5	119	0	244	998	6	1	17	855	273	**2677**
7:15 AM	8:15 AM	0	19	14	18	0	120	5	139	0	253	994	10	1	19	908	315	**2815**
7:30 AM	8:30 AM	0	20	15	17	0	117	6	156	0	233	946	11	1	20	913	288	**2743**
7:45 AM	8:45 AM	0	18	15	14	0	107	6	145	0	229	848	11	1	17	822	230	**2463**
8:00 AM	9:00 AM	0	11	12	13	0	95	6	132	0	174	795	11	1	11	742	177	**2180**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	19	14	18	0	120	5	139	0	253	994	10	1	19	908	315	**2815**
PHF BY MOVEMENT	0.00	0.53	0.58	0.75	0.00	0.81	0.63	0.83	0.00	0.68	0.78	0.50	0.25	0.59	0.90	0.85	OVERALL
PHF BY APPROACH		0.75				0.88				0.83				0.88			0.88
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	3		5		7		4		77		74		67		71		**154**
TRUCK PERCENTAGE	5.9%		0.9%		2.7%		11.8%		6.1%		6.5%		5.4%		6.7%		**5.5%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

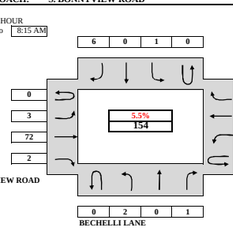
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

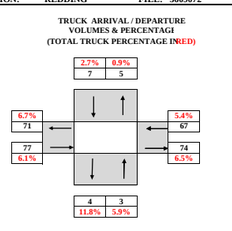
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN(ED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		1	0	0		0	1	0		1	15	0		0	8	1	**27**
7:15 AM	7:30 AM		1	0	0		0	1	4		1	27	0		1	20	1	**56**
7:30 AM	7:45 AM		3	0	1		0	1	5		2	56	0		2	35	2	**107**
7:45 AM	8:00 AM		3	0	1		0	1	6		4	71	1		2	55	2	**146**
8:00 AM	8:15 AM		3	0	1		1	1	6		4	87	2		2	71	3	**181**
8:15 AM	8:30 AM		4	0	2		1	2	6		4	107	2		2	86	4	**220**
8:30 AM	8:45 AM		4	0	3		1	2	10		5	123	2		2	101	4	**257**
8:45 AM	9:00 AM		4	0	3		1	2	10		9	137	2		2	111	5	**286**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	1	0	0	0	0	1	0	0	1	15	0	0	0	8	1	**27**
7:15 AM	7:30 AM	0	0	0	0	0	0	1	4	0	0	12	0	0	1	12	0	**29**
7:30 AM	7:45 AM	0	2	0	1	0	0	0	1	0	1	29	0	0	1	15	1	**51**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	1	0	2	15	1	0	0	20	0	**39**
8:00 AM	8:15 AM	0	0	0	0	0	1	0	0	0	0	16	1	0	0	16	1	**35**
8:15 AM	8:30 AM	0	1	0	1	0	0	1	0	0	0	20	0	0	0	15	1	**39**
8:30 AM	8:45 AM	0	0	0	1	0	0	0	4	0	1	16	0	0	0	15	0	**37**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	14	0	0	0	10	1	**29**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	3	0	1	0	0	1	6	0	4	71	1	0	2	55	2	**146**
7:15 AM	8:15 AM	0	2	0	1	0	1	0	6	0	3	72	2	0	2	63	2	**154**
7:30 AM	8:30 AM	0	3	0	2	0	1	1	2	0	3	80	2	0	1	66	3	**164**
7:45 AM	8:45 AM	0	1	0	2	0	1	1	5	0	3	67	2	0	0	66	2	**150**
8:00 AM	9:00 AM	0	1	0	2	0	1	1	4	0	5	66	1	0	0	56	3	**140**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

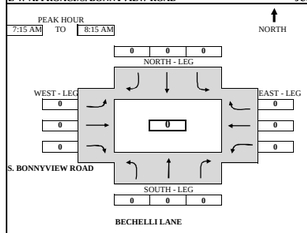
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	3	5	7	4	77	74	67	71	154
TRUCK PERCENTAGE	5.9%	0.9%	2.7%	11.8%	6.1%	6.5%	5.4%	6.7%	5.5%

B.A.Y.M.E.T.R.I.C.S.

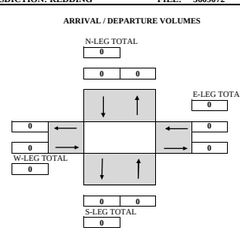
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

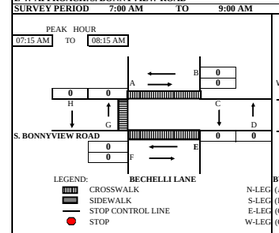
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

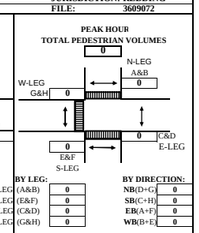
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: BECHELLI LANE — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:

N-LEG (A&B)	0
S-LEG (E&F)	0
E-LEG (C&D)	0
W-LEG (G&H)	0

BY DIRECTION:

NB(D+G)	0
SB(C+H)	0
EB(A+F)	0
WB(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

7:15 AM to 8:15 AM

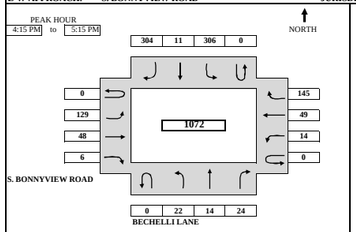
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

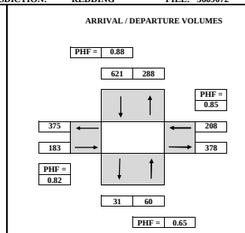
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM to 5:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		3	1	3		66	1	72		24	11	2	0	2	12	31	**228**
4:15 PM	4:30 PM		4	3	10		131	3	141		51	22	3	0	6	23	68	**465**
4:30 PM	4:45 PM		11	5	15		205	7	224		88	40	4	0	9	36	104	**748**
4:45 PM	5:00 PM		19	11	24		293	11	309		116	50	8	0	12	51	147	**1051**
5:00 PM	5:15 PM		25	15	27		372	12	376		153	59	8	0	16	61	176	**1300**
5:15 PM	5:30 PM		34	17	32		429	15	434		188	69	13	1	23	70	207	**1532**
5:30 PM	5:45 PM		39	20	34		526	19	480		220	74	22	3	28	78	245	**1788**
5:45 PM	6:00 PM		45	23	41		579	26	533		242	85	25	5	32	91	272	**1999**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	3	1	3	0	66	1	72	0	24	11	2	0	2	12	31	**228**
4:15 PM	4:30 PM	0	1	2	7	0	65	2	69	0	27	11	1	0	4	11	37	**237**
4:30 PM	4:45 PM	0	7	2	5	0	74	4	83	0	37	18	1	0	3	13	36	**283**
4:45 PM	5:00 PM	0	8	6	9	0	88	4	85	0	28	10	4	0	3	15	43	**303**
5:00 PM	5:15 PM	0	6	4	3	0	79	1	67	0	37	9	0	0	4	10	29	**249**
5:15 PM	5:30 PM	0	9	2	5	0	57	3	58	0	35	10	5	1	7	9	31	**232**
5:30 PM	5:45 PM	0	5	3	2	0	97	4	46	0	32	5	9	2	5	8	38	**256**
5:45 PM	6:00 PM	0	6	3	7	0	53	7	53	0	22	11	3	2	4	13	27	**211**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	19	11	24	0	293	11	309	0	116	50	8	0	12	51	147	**1051**
4:15 PM	5:15 PM	0	22	14	24	0	306	11	304	0	129	48	6	0	14	49	145	**1072**
4:30 PM	5:30 PM	0	30	14	22	0	298	12	293	0	137	47	10	1	17	47	139	**1067**
4:45 PM	5:45 PM	0	28	15	19	0	321	12	256	0	132	34	18	3	19	42	141	**1040**
5:00 PM	6:00 PM	0	26	12	17	0	286	15	224	0	126	35	17	5	20	40	125	**948**

PEAK HOUR SUMMARY

4:15 PM to 5:15 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	22	14	24	0	306	11	304	0	129	48	6	0	14	49	145	**1072**
PHF BY MOVEMENT	0.00	0.69	0.58	0.67	0.00	0.87	0.69	0.89	0.00	0.87	0.67	0.38	0.00	0.88	0.82	0.84	OVERALL
PHF BY APPROACH		0.65				0.88				0.82				0.85			0.88
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	1		5		9		1		51		54		51		52		**112**
TRUCK PERCENTAGE	1.7%		1.7%		1.4%		3.2%		27.9%		14.3%		24.5%		13.9%		**10.4%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				1				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				1				0				0				**1**

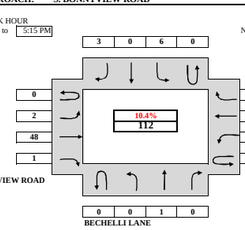
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

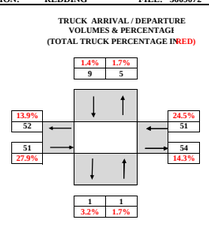
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM to 5:15 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE INCED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0	0		2	0	1		3	11	0	0	12	2		**31**
4:15 PM	4:30 PM		0	0	0		4	0	2		3	22	0	0	23	3		**57**
4:30 PM	4:45 PM		0	0	0		4	0	2		3	40	1	0	36	3		**89**
4:45 PM	5:00 PM		0	1	0		7	0	3		4	50	1	0	51	3		**120**
5:00 PM	5:15 PM		0	1	0		8	0	4		5	59	1	0	61	4		**143**
5:15 PM	5:30 PM		0	1	0		8	0	4		5	69	2	0	70	5		**164**
5:30 PM	5:45 PM		0	1	0		8	0	5		5	74	2	0	78	5		**178**
5:45 PM	6:00 PM		0	1	0		8	0	5		6	85	2	0	91	5		**203**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	2	0	1	0	3	11	0	0	12	2	0	**31**
4:15 PM	4:30 PM	0	0	0	0	0	2	0	1	0	0	11	0	0	11	1	0	**26**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	18	1	0	13	0	0	**32**
4:45 PM	5:00 PM	0	0	1	0	0	3	0	1	0	1	10	0	0	15	0	0	**31**
5:00 PM	5:15 PM	0	0	0	0	0	1	0	1	0	1	9	0	0	10	1	0	**23**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	10	1	0	9	1	0	**21**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	1	0	0	5	0	0	8	0	0	**14**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	1	11	0	0	13	0	0	**25**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	1	0	0	7	0	3	0	4	50	1	0	51	3	0	**120**
4:15 PM	5:15 PM	0	0	1	0	0	6	0	3	0	2	48	1	0	49	2	0	**112**
4:30 PM	5:30 PM	0	0	1	0	0	4	0	2	0	2	47	2	0	47	2	0	**107**
4:45 PM	5:45 PM	0	0	1	0	0	4	0	3	0	2	34	1	0	42	2	0	**89**
5:00 PM	6:00 PM	0	0	0	0	0	1	0	2	0	2	35	1	0	40	2	0	**83**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

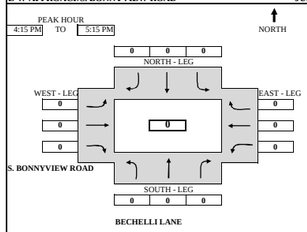
4:15 PM to 5:15 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	1	5	9	1	51	54	51	52	112
TRUCK PERCENTAGE	1.7%	1.7%	1.4%	3.2%	27.9%	14.3%	24.5%	13.9%	10.4%

B.A.Y.M.E.T.R.I.C.S.

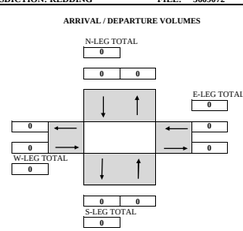
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM to 5:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

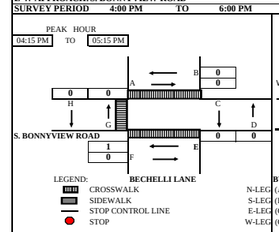
4:15 PM to 5:15 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

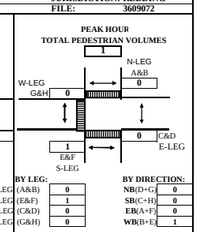
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: BECHELLI LANE — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:15 PM TO 05:15 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:		BY DIRECTION:	
N-LEG (A&B)	0	NB(D+G)	0
S-LEG (E&F)	1	SB(C+H)	0
E-LEG (C&D)	0	EB(A+F)	0
W-LEG (G&H)	0	WB(B+E)	1

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	1	0	0	*1*
04:15 PM	--- 04:30 PM	0	0	0	0	1	1	0	0	*2*
04:30 PM	--- 04:45 PM	0	0	0	0	1	1	0	0	*2*
04:45 PM	--- 05:00 PM	0	0	0	0	1	1	0	0	*2*
05:00 PM	--- 05:15 PM	0	0	0	0	1	1	0	0	*2*
05:15 PM	--- 05:30 PM	0	0	0	0	1	1	0	0	*2*
05:30 PM	--- 05:45 PM	0	0	0	0	2	1	0	0	*3*
05:45 PM	--- 06:00 PM	0	0	0	0	2	1	1	0	*4*
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	1	0	0	*1*
04:15 PM	--- 04:30 PM	0	0	0	0	1	0	0	0	*1*
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	--- 05:45 PM	0	0	0	0	1	0	0	0	*1*
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	1	0	*1*
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	1	1	0	0	*2*
04:15 PM	--- 05:15 PM	0	0	0	0	1	0	0	0	*1*
04:30 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:45 PM	0	0	0	0	1	0	0	0	*1*
05:00 PM	--- 06:00 PM	0	0	0	0	1	0	1	0	*2*

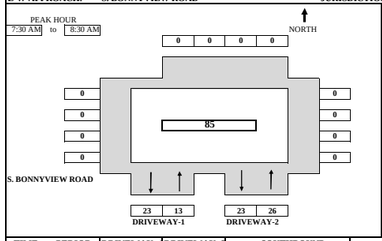
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

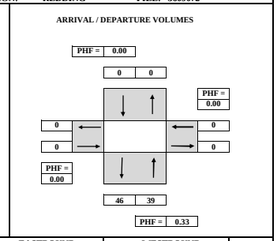
4:15 PM to 5:15 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	1	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	1	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: TEXACO GAS STATION DW¹ - DWY2 — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		DRIVEWAY -1		DRIVEWAY -2		SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	IN	OUT	IN	OUT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM	5	3	5	3													16
7:15 AM	7:30 AM	10	6	10	5													31
7:30 AM	7:45 AM	16	9	12	12													49
7:45 AM	8:00 AM	23	14	19	23													79
8:00 AM	8:15 AM	29	15	24	25													93
8:15 AM	8:30 AM	33	19	33	31													116
8:30 AM	8:45 AM	37	21	37	35													130
8:45 AM	9:00 AM	39	26	44	36													145
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	5	3	5	3	0	0	0	0	0	0	0	0	0	0	0	0	16
7:15 AM	7:30 AM	5	3	5	2	0	0	0	0	0	0	0	0	0	0	0	0	15
7:30 AM	7:45 AM	6	3	2	7	0	0	0	0	0	0	0	0	0	0	0	0	18
7:45 AM	8:00 AM	7	5	7	11	0	0	0	0	0	0	0	0	0	0	0	0	30
8:00 AM	8:15 AM	6	1	5	2	0	0	0	0	0	0	0	0	0	0	0	0	14
8:15 AM	8:30 AM	4	4	9	6	0	0	0	0	0	0	0	0	0	0	0	0	23
8:30 AM	8:45 AM	4	2	4	4	0	0	0	0	0	0	0	0	0	0	0	0	14
8:45 AM	9:00 AM	2	5	7	1	0	0	0	0	0	0	0	0	0	0	0	0	15
HOURLY TOTALS																		
7:00 AM	8:00 AM	23	14	19	23	0	0	0	0	0	0	0	0	0	0	0	0	79
7:15 AM	8:15 AM	24	12	19	22	0	0	0	0	0	0	0	0	0	0	0	0	77
7:30 AM	8:30 AM	23	13	23	26	0	0	0	0	0	0	0	0	0	0	0	0	85
7:45 AM	8:45 AM	21	12	25	23	0	0	0	0	0	0	0	0	0	0	0	0	81
8:00 AM	9:00 AM	16	12	25	13	0	0	0	0	0	0	0	0	0	0	0	0	66

PEAK HOUR SUMMARY

7:30 AM to 8:30 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	23	13	23	26	0	0	0	0	0	0	0	0	0	0	0	0	**85**
PHF BY MOVEMENT	0.82	0.65	0.64	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	OVERALL
PHF BY APPROACH	0.71				0.00				0.00				0.00				0.71
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	2		0		0		3		0		0		0		0		**5**
TRUCK PERCENTAGE	5.1%		0.0%		0.0%		6.5%		0.0%		0.0%		0.0%		0.0%		**5.9%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				0				1				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				1				0				0				**1**

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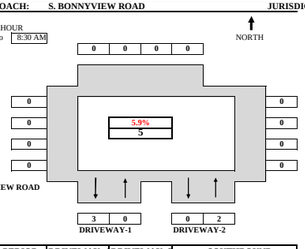
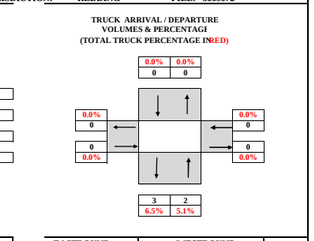
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: TEXACO GAS STATION DWY 1 — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		DRIVEWAY -1		DRIVEWAY -2		SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	IN	OUT	IN	OUT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM	0	0	0	0													**0**
7:15 AM	7:30 AM	1	0	2	0													**3**
7:30 AM	7:45 AM	1	0	2	0													**3**
7:45 AM	8:00 AM	1	0	2	0													**3**
8:00 AM	8:15 AM	2	0	2	1													**5**
8:15 AM	8:30 AM	4	0	2	2													**8**
8:30 AM	8:45 AM	4	0	3	4													**11**
8:45 AM	9:00 AM	4	0	3	4													**11**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**2**
8:15 AM	8:30 AM	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**3**
8:30 AM	8:45 AM	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	**3**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																		
7:00 AM	8:00 AM	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7:15 AM	8:15 AM	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	**5**
7:30 AM	8:30 AM	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**5**
7:45 AM	8:45 AM	3	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	**8**
8:00 AM	9:00 AM	3	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	**8**

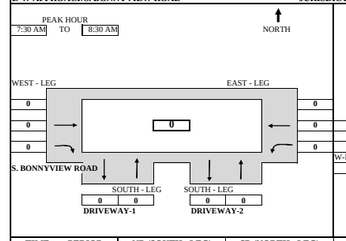
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

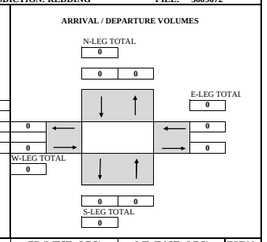
7:30 AM to 8:30 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	2	0	0	3	0	0	0	0	5
TRUCK PERCENTAGE	5.1%	0.0%	0.0%	6.5%	0.0%	0.0%	0.0%	0.0%	5.9%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: TEXACO GAS STATION DWY 1 — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

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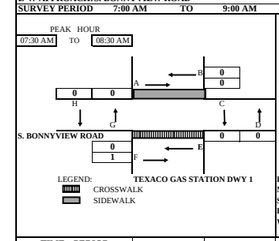
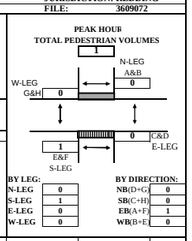
7:30 AM to 8:30 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: TEXACO GAS STATION DWY 1 — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	A	B	C	D	E	F	G	H	TOTAL
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	1	0	0	0	**1**
07:15 AM	--- 07:30 AM	0	0	0	0	3	1	0	0	**4**
07:30 AM	--- 07:45 AM	0	0	0	0	3	1	0	0	**4**
07:45 AM	--- 08:00 AM	0	0	0	0	3	1	0	0	**4**
08:00 AM	--- 08:15 AM	0	0	0	0	3	2	0	0	**5**
08:15 AM	--- 08:30 AM	0	0	0	0	3	2	0	0	**5**
08:30 AM	--- 08:45 AM	0	0	0	0	3	2	0	0	**5**
08:45 AM	--- 09:00 AM	0	0	0	0	4	2	0	0	**6**
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	1	0	0	0	**1**
07:15 AM	--- 07:30 AM	0	0	0	0	2	1	0	0	**3**
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	**0**
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	**0**
08:00 AM	--- 08:15 AM	0	0	0	0	1	0	0	0	**1**
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	**0**
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	**0**
08:45 AM	--- 09:00 AM	0	0	0	0	1	0	0	0	**1**
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	3	1	0	0	**4**
07:15 AM	--- 08:15 AM	0	0	0	0	2	2	0	0	**4**
07:30 AM	--- 08:30 AM	0	0	0	0	1	1	0	0	**1**
07:45 AM	--- 08:45 AM	0	0	0	0	0	1	0	0	**1**
08:00 AM	--- 09:00 AM	0	0	0	0	1	1	0	0	**2**

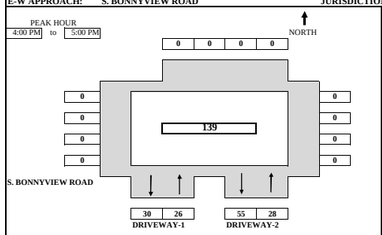
Tel : (510) 232-1271 *Fax: (510) 232-1272*

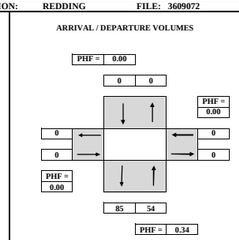
7:30 AM to 8:30 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	1	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	1	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: TEXACO GAS STATION DW1 - DWY2 — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		DRIVEWAY -1		DRIVEWAY -2		SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	IN	OUT	IN	OUT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM	9	6	17	8													**40**
4:15 PM	4:30 PM	18	10	28	18													**74**
4:30 PM	4:45 PM	23	16	41	22													**102**
4:45 PM	5:00 PM	30	26	55	28													**139**
5:00 PM	5:15 PM	36	32	66	33													**167**
5:15 PM	5:30 PM	43	39	71	39													**192**
5:30 PM	5:45 PM	46	45	76	43													**210**
5:45 PM	6:00 PM	49	49	89	45													**232**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	9	6	17	8	0	0	0	0	0	0	0	0	0	0	0	0	**40**
4:15 PM	4:30 PM	9	4	11	10	0	0	0	0	0	0	0	0	0	0	0	0	**34**
4:30 PM	4:45 PM	5	6	13	4	0	0	0	0	0	0	0	0	0	0	0	0	**28**
4:45 PM	5:00 PM	7	10	14	6	0	0	0	0	0	0	0	0	0	0	0	0	**37**
5:00 PM	5:15 PM	6	6	11	5	0	0	0	0	0	0	0	0	0	0	0	0	**28**
5:15 PM	5:30 PM	7	7	5	6	0	0	0	0	0	0	0	0	0	0	0	0	**25**
5:30 PM	5:45 PM	3	6	5	4	0	0	0	0	0	0	0	0	0	0	0	0	**18**
5:45 PM	6:00 PM	3	4	13	2	0	0	0	0	0	0	0	0	0	0	0	0	**22**
HOURLY TOTALS																		
4:00 PM	5:00 PM	30	26	55	28	0	0	0	0	0	0	0	0	0	0	0	0	**139**
4:15 PM	5:15 PM	27	26	49	25	0	0	0	0	0	0	0	0	0	0	0	0	**127**
4:30 PM	5:30 PM	25	29	43	21	0	0	0	0	0	0	0	0	0	0	0	0	**118**
4:45 PM	5:45 PM	23	29	35	21	0	0	0	0	0	0	0	0	0	0	0	0	**108**
5:00 PM	6:00 PM	19	23	34	17	0	0	0	0	0	0	0	0	0	0	0	0	**93**

PEAK HOUR SUMMARY

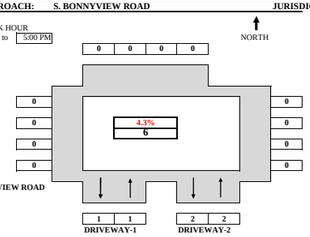
4:00 PM to 5:00 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	30	26	55	28	0	0	0	0	0	0	0	0	0	0	0	0	**139**
PHF BY MOVEMENT	0.83	0.65	0.81	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	OVERALL
PHF BY APPROACH	0.87				0.00				0.00				0.00				0.87
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	3		0		0		3		0		0		0		0		**6**
TRUCK PERCENTAGE	5.6%		0.0%		0.0%		3.5%		0.0%		0.0%		0.0%		0.0%		**4.3%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				0				1				0				**1**
	N-LEG				S-LEG				E-LEG				W-LEG				
PEDESTRIAN BY LEG	0				1				0				0				**1**

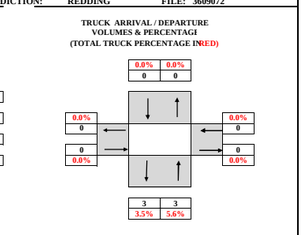
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: TEXACO GAS STATION DWY 1 — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		DRIVEWAY -1		DRIVEWAY -2		SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	IN	OUT	IN	OUT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM	1	1	0	2													**4**
4:15 PM	4:30 PM	1	1	0	2													**4**
4:30 PM	4:45 PM	1	1	0	2													**4**
4:45 PM	5:00 PM	1	1	2	2													**6**
5:00 PM	5:15 PM	1	1	2	2													**6**
5:15 PM	5:30 PM	1	1	3	2													**7**
5:30 PM	5:45 PM	2	1	3	2													**8**
5:45 PM	6:00 PM	2	1	3	2													**8**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	**4**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5:30 PM	5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																		
4:00 PM	5:00 PM	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	**6**
4:15 PM	5:15 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
4:30 PM	5:30 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
4:45 PM	5:45 PM	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
5:00 PM	6:00 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**

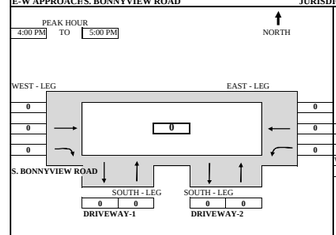
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

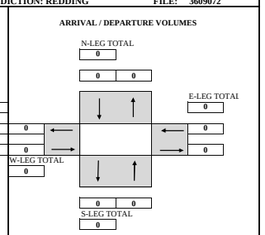
4:00 PM to 5:00 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	3	0	0	3	0	0	0	0	6
TRUCK PERCENTAGE	5.6%	0.0%	0.0%	3.5%	0.0%	0.0%	0.0%	0.0%	4.3%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: TEXACO GAS STATION DWY 1 — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

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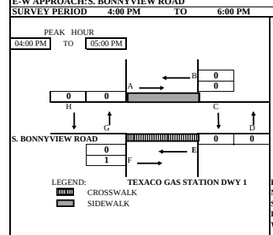
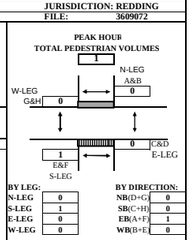
4:00 PM to 5:00 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH					
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: TEXACO GAS STATION DWY 1 — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	A	B	C	D	E	F	G	H	TOTAL
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	**0**
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	**0**
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	**0**
04:45 PM	05:00 PM	0	0	0	0	0	1	0	0	**1**
05:00 PM	05:15 PM	0	0	0	0	2	1	0	0	**3**
05:15 PM	05:30 PM	0	0	0	0	2	1	0	0	**3**
05:30 PM	05:45 PM	0	0	0	0	2	1	0	0	**3**
05:45 PM	06:00 PM	0	0	0	0	2	1	0	0	**3**
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	**0**
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	**0**
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	**0**
04:45 PM	05:00 PM	0	0	0	0	0	1	0	0	**1**
05:00 PM	05:15 PM	0	0	0	0	2	0	0	0	**2**
05:15 PM	05:30 PM	0	0	0	0	0	0	0	0	**0**
05:30 PM	05:45 PM	0	0	0	0	0	0	0	0	**0**
05:45 PM	06:00 PM	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS										
04:00 PM	05:00 PM	0	0	0	0	0	1	0	0	**1**
04:15 PM	05:15 PM	0	0	0	0	2	1	0	0	**3**
04:30 PM	05:30 PM	0	0	0	0	2	1	0	0	**3**
04:45 PM	05:45 PM	0	0	0	0	2	1	0	0	**3**
05:00 PM	06:00 PM	0	0	0	0	2	0	0	0	**2**

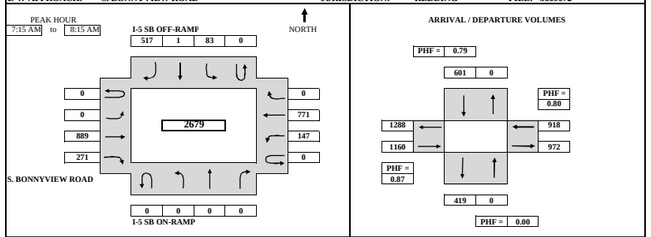
Tel : (510) 232-1271 *Fax: (510) 232-1272*

4:00 PM to 5:00 PM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION					
PEDESTRIAN	0	0	1	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	1	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 SB ON-RAMP - I-5 SB OFF-RAMP — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						12	0	97		149	61			35	128		**482**
7:15 AM	7:30 AM						31	0	172		356	138			73	297		**1067**
7:30 AM	7:45 AM						48	0	315		623	204			114	513		**1817**
7:45 AM	8:00 AM						79	1	472		861	277			147	766		**2603**
8:00 AM	8:15 AM						95	1	614		1038	332			182	899		**3161**
8:15 AM	8:30 AM						116	1	701		1220	379			214	1048		**3679**
8:30 AM	8:45 AM						139	1	767		1414	418			243	1163		**4145**
8:45 AM	9:00 AM						154	2	840		1597	460			279	1289		**4621**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	12	0	97	0	0	149	61	0	35	128	0	**482**
7:15 AM	7:30 AM	0	0	0	0	0	19	0	75	0	0	207	77	0	38	169	0	**585**
7:30 AM	7:45 AM	0	0	0	0	0	17	0	143	0	0	267	66	0	41	216	0	**750**
7:45 AM	8:00 AM	0	0	0	0	0	31	1	157	0	0	238	73	0	33	253	0	**786**
8:00 AM	8:15 AM	0	0	0	0	0	16	0	142	0	0	177	55	0	35	133	0	**558**
8:15 AM	8:30 AM	0	0	0	0	0	21	0	87	0	0	182	47	0	32	149	0	**518**
8:30 AM	8:45 AM	0	0	0	0	0	23	0	66	0	0	194	39	0	29	115	0	**466**
8:45 AM	9:00 AM	0	0	0	0	0	15	1	73	0	0	183	42	0	36	126	0	**476**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	79	1	472	0	0	861	277	0	147	766	0	**2603**
7:15 AM	8:15 AM	0	0	0	0	0	83	1	517	0	0	889	271	0	147	771	0	**2679**
7:30 AM	8:30 AM	0	0	0	0	0	85	1	529	0	0	864	241	0	141	751	0	**2612**
7:45 AM	8:45 AM	0	0	0	0	0	91	1	452	0	0	791	214	0	129	650	0	**2328**
8:00 AM	9:00 AM	0	0	0	0	0	75	1	368	0	0	736	183	0	132	523	0	**2018**

PEAK HOUR SUMMARY

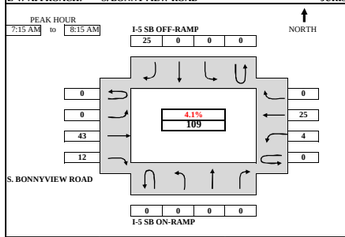
7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	83	1	517	0	0	889	271	0	147	771	0	**2679**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.67	0.25	0.82	0.00	0.00	0.83	0.88	0.00	0.90	0.76	0.00	OVERALL
PHF BY APPROACH	0.00				0.79				0.87				0.80				0.85
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		0		25		16		55		43		29		50		**109**
TRUCK PERCENTAGE	0.0%		0.0%		4.2%		3.8%		4.7%		4.4%		3.2%		3.9%		**4.1%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				2				0				**2**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				2				0				0				**2**

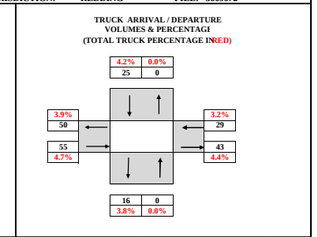
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 SB ON-RAMP - I-5 SB OFF-RAMP — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						0	0	6		9	5			1	11		**32**
7:15 AM	7:30 AM						0	0	11		19	9			1	16		**56**
7:30 AM	7:45 AM						0	0	16		26	12			2	24		**80**
7:45 AM	8:00 AM						0	0	23		43	15			4	31		**116**
8:00 AM	8:15 AM						0	0	31		52	17			5	36		**141**
8:15 AM	8:30 AM						1	0	40		63	21			5	40		**170**
8:30 AM	8:45 AM						1	0	44		78	27			7	44		**201**
8:45 AM	9:00 AM						1	1	50		84	28			11	49		**224**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	6	0	0	9	5	0	1	11	0	**32**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	5	0	0	10	4	0	0	5	0	**24**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	5	0	0	7	3	0	1	8	0	**24**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	7	0	0	17	3	0	2	7	0	**36**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	8	0	0	9	2	0	1	5	0	**25**
8:15 AM	8:30 AM	0	0	0	0	0	1	0	9	0	0	11	4	0	0	4	0	**29**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	4	0	0	15	6	0	2	4	0	**31**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	6	0	0	6	1	0	4	5	0	**23**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	0	0	23	0	0	43	15	0	4	31	0	**116**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	25	0	0	43	12	0	4	25	0	**109**
7:30 AM	8:30 AM	0	0	0	0	0	1	0	29	0	0	44	12	0	4	24	0	**114**
7:45 AM	8:45 AM	0	0	0	0	0	1	0	28	0	0	52	15	0	5	20	0	**121**
8:00 AM	9:00 AM	0	0	0	0	0	0	1	27	0	0	41	13	0	7	18	0	**108**

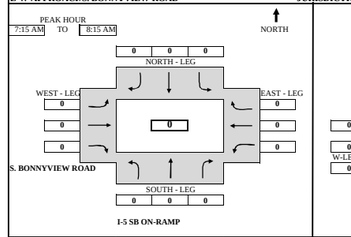
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

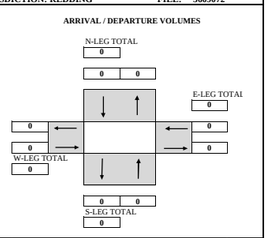
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	0	25	16	55	43	29	50	109
TRUCK PERCENTAGE	0.0%	0.0%	4.2%	3.8%	4.7%	4.4%	3.2%	3.9%	4.1%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 SB ON-RAMP - I-5 SB OFF-RAMP — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

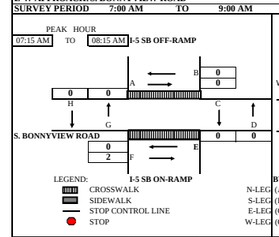
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

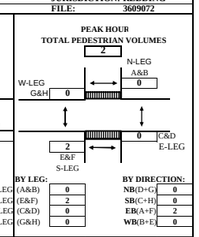
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: I-5 SB ON-RAMP - I-5 SB OFF-RAMP — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072





BY LEG:		BY DIRECTION:	
N-LEG (A&B)	0	**NB**(D+G)	0
S-LEG (E&F)	2	**SB**(C+H)	0
E-LEG (C&D)	0	**EB**(A+F)	2
W-LEG (G&H)	0	**WB**(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	1	0	0	***1***
07:30 AM	--- 07:45 AM	0	0	0	0	0	1	0	0	***1***
07:45 AM	--- 08:00 AM	0	0	0	0	0	1	0	0	***1***
08:00 AM	--- 08:15 AM	0	0	0	0	0	2	0	0	***2***
08:15 AM	--- 08:30 AM	0	0	0	0	0	2	0	0	***2***
08:30 AM	--- 08:45 AM	0	0	0	0	0	2	0	0	***2***
08:45 AM	--- 09:00 AM	0	0	0	0	0	2	0	0	***2***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	1	0	0	***1***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	1	0	0	***1***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	1	0	0	***1***
07:15 AM	--- 08:15 AM	0	0	0	0	0	2	0	0	***2***
07:30 AM	--- 08:30 AM	0	0	0	0	0	1	0	0	***1***
07:45 AM	--- 08:45 AM	0	0	0	0	0	1	0	0	***1***
08:00 AM	--- 09:00 AM	0	0	0	0	0	1	0	0	***1***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

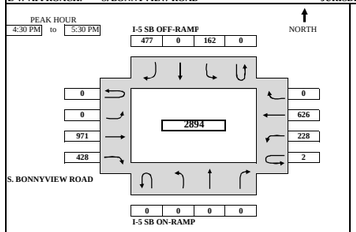
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	2	0	**2**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	2	0	0	**2**

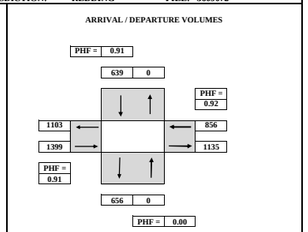
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 SB ON-RAMP - I-5 SB OFF-RAMP — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						31	0	117			203	79		0	49	154	**633**
4:15 PM	4:30 PM						64	0	240			404	162		0	114	310	**1294**
4:30 PM	4:45 PM						94	0	354			636	255		2	178	445	**1964**
4:45 PM	5:00 PM						142	0	466			859	344		2	234	622	**2669**
5:00 PM	5:15 PM						195	0	588			1123	456		2	281	777	**3422**
5:15 PM	5:30 PM						226	0	717			1375	590		2	342	936	**4188**
5:30 PM	5:45 PM						255	1	849			1609	687		2	376	1046	**4825**
5:45 PM	6:00 PM						292	1	946			1798	755		2	417	1183	**5394**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	31	0	117	0	0	203	79	0	49	154	0	**633**
4:15 PM	4:30 PM	0	0	0	0	0	33	0	123	0	0	201	83	0	65	156	0	**661**
4:30 PM	4:45 PM	0	0	0	0	0	30	0	114	0	0	232	93	2	64	135	0	**670**
4:45 PM	5:00 PM	0	0	0	0	0	48	0	112	0	0	223	89	0	56	177	0	**705**
5:00 PM	5:15 PM	0	0	0	0	0	53	0	122	0	0	264	112	0	47	155	0	**753**
5:15 PM	5:30 PM	0	0	0	0	0	31	0	129	0	0	252	134	0	61	159	0	**766**
5:30 PM	5:45 PM	0	0	0	0	0	29	1	132	0	0	234	97	0	34	110	0	**637**
5:45 PM	6:00 PM	0	0	0	0	0	37	0	97	0	0	189	68	0	41	137	0	**569**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	142	0	466	0	0	859	344	2	234	622	0	**2669**
4:15 PM	5:15 PM	0	0	0	0	0	164	0	471	0	0	920	377	2	232	623	0	**2789**
4:30 PM	5:30 PM	0	0	0	0	0	162	0	477	0	0	971	428	2	228	626	0	**2894**
4:45 PM	5:45 PM	0	0	0	0	0	161	1	495	0	0	973	432	0	198	601	0	**2861**
5:00 PM	6:00 PM	0	0	0	0	0	150	1	480	0	0	939	411	0	183	561	0	**2725**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	162	0	477	0	0	971	428	2	228	626	0	**2894**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.92	0.00	0.00	0.92	0.80	0.25	0.89	0.88	0.00	OVERALL
PHF BY APPROACH	0.00				0.91				0.91				0.92				0.94
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		0		25		15		35		33		36		48		**96**
TRUCK PERCENTAGE	0.0%		0.0%		3.9%		2.3%		2.5%		2.9%		4.2%		4.4%		**3.3%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				2				**2**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				2				0				0				**2**

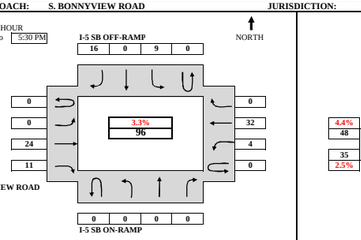
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

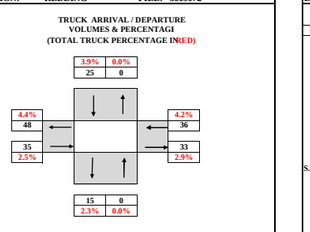
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 SB ON-RAMP - I-5 SB OFF-RAMP — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						0	3			6	3		1	7			**20**
4:15 PM	4:30 PM						2	11			16	7		3	11			**50**
4:30 PM	4:45 PM						4	16			24	12		5	16			**77**
4:45 PM	5:00 PM						9	18			28	16		6	28			**105**
5:00 PM	5:15 PM						10	23			33	16		6	38			**126**
5:15 PM	5:30 PM						11	27			40	18		7	43			**146**
5:30 PM	5:45 PM						11	30			44	19		7	47			**158**
5:45 PM	6:00 PM						12	33			49	20		7	56			**177**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	3	0	0	6	3	0	1	7	0		**20**
4:15 PM	4:30 PM	0	0	0	0	0	2	8	0	0	10	4	0	2	4	0		**30**
4:30 PM	4:45 PM	0	0	0	0	0	2	5	0	0	8	5	0	2	5	0		**27**
4:45 PM	5:00 PM	0	0	0	0	0	5	2	0	0	4	4	0	1	12	0		**28**
5:00 PM	5:15 PM	0	0	0	0	0	1	5	0	0	5	0	0	0	10	0		**21**
5:15 PM	5:30 PM	0	0	0	0	0	1	4	0	0	7	2	0	1	5	0		**20**
5:30 PM	5:45 PM	0	0	0	0	0	0	3	0	0	4	1	0	0	4	0		**12**
5:45 PM	6:00 PM	0	0	0	0	0	1	3	0	0	5	1	0	0	9	0		**19**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	9	0	18	0	0	28	16	0	6	28	0	**105**
4:15 PM	5:15 PM	0	0	0	0	0	10	0	20	0	0	27	13	0	5	31	0	**106**
4:30 PM	5:30 PM	0	0	0	0	0	9	0	16	0	0	24	11	0	4	32	0	**96**
4:45 PM	5:45 PM	0	0	0	0	0	7	0	14	0	0	20	7	0	2	31	0	**81**
5:00 PM	6:00 PM	0	0	0	0	0	3	0	15	0	0	21	4	0	1	28	0	**72**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

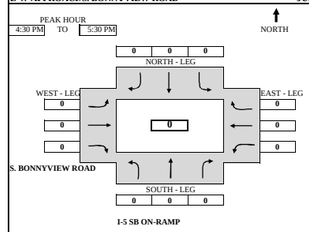
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	0	25	15	35	33	36	48	96
TRUCK PERCENTAGE	0.0%	0.0%	3.9%	2.3%	2.5%	2.9%	4.2%	4.4%	3.3%

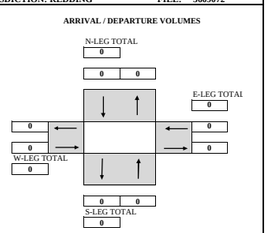
B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 SB ON-RAMP — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

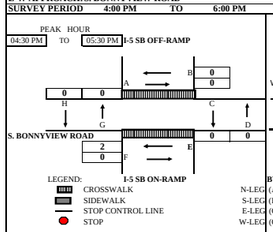
4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

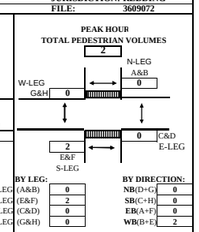
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: I-5 SB ON-RAMP - I-5 SB OFF-RAMP — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:30 PM TO 05:30 PM





LEGEND: CROSSWALK, SIDEWALK, STOP CONTROL LINE, STOP

BY LEG:	
N-LEG (A&B)	0
S-LEG (E&F)	2
E-LEG (C&D)	0
W-LEG (G&H)	0

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	0
EB(A+F)	0
WB(B+E)	2

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	1	0	0	0	*1*
04:15 PM	--- 04:30 PM	0	0	0	0	1	0	0	0	*1*
04:30 PM	--- 04:45 PM	0	0	0	0	2	0	0	0	*2*
04:45 PM	--- 05:00 PM	0	0	0	0	2	0	0	0	*2*
05:00 PM	--- 05:15 PM	0	0	0	0	3	0	0	0	*3*
05:15 PM	--- 05:30 PM	0	0	0	0	3	0	0	0	*3*
05:30 PM	--- 05:45 PM	0	0	0	0	3	0	0	0	*3*
05:45 PM	--- 06:00 PM	0	1	0	0	3	0	0	0	*4*
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	1	0	0	0	*1*
04:15 PM	--- 04:30 PM	0	0	0	0	1	0	0	0	*1*
04:30 PM	--- 04:45 PM	0	0	0	0	1	0	0	0	*1*
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 05:15 PM	0	0	0	0	1	0	0	0	*1*
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	--- 06:00 PM	0	1	0	0	0	0	0	0	*1*
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	2	0	0	0	*2*
04:15 PM	--- 05:15 PM	0	0	0	0	2	0	0	0	*2*
04:30 PM	--- 05:30 PM	0	0	0	0	2	0	0	0	*2*
04:45 PM	--- 05:45 PM	0	0	0	0	1	0	0	0	*1*
05:00 PM	--- 06:00 PM	0	1	0	0	1	0	0	0	*2*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

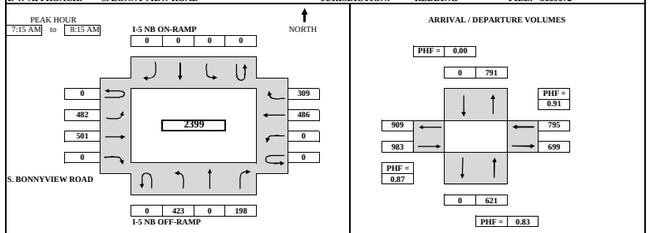
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	2	**2**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	2	0	0	**2**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 NB OFF-RAMP - I-5 NB ON-RAMP — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		67	46							81	74			78	57		**403**
7:15 AM	7:30 AM		158	85							185	201			205	120		**954**
7:30 AM	7:45 AM		287	142							308	349			320	218		**1624**
7:45 AM	8:00 AM		406	203							465	476			455	302		**2307**
8:00 AM	8:15 AM		490	244							563	575			564	366		**2802**
8:15 AM	8:30 AM		547	292							659	669			678	409		**3254**
8:30 AM	8:45 AM		608	330							752	790			779	451		**3710**
8:45 AM	9:00 AM		664	374							859	899			875	508		**4179**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	67	0	46	0	0	0	0	0	81	74	0	0	0	78	57	**403**
7:15 AM	7:30 AM	0	91	0	39	0	0	0	0	0	104	127	0	0	0	127	63	**551**
7:30 AM	7:45 AM	0	129	0	57	0	0	0	0	0	123	148	0	0	0	115	98	**670**
7:45 AM	8:00 AM	0	119	0	61	0	0	0	0	0	157	127	0	0	0	135	84	**683**
8:00 AM	8:15 AM	0	84	0	41	0	0	0	0	0	98	99	0	0	0	109	64	**495**
8:15 AM	8:30 AM	0	57	0	48	0	0	0	0	0	96	94	0	0	0	114	43	**452**
8:30 AM	8:45 AM	0	61	0	38	0	0	0	0	0	93	121	0	0	0	101	42	**456**
8:45 AM	9:00 AM	0	56	0	44	0	0	0	0	0	107	109	0	0	0	96	57	**469**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	406	0	203	0	0	0	0	0	465	476	0	0	0	455	302	**2307**
7:15 AM	8:15 AM	0	423	0	198	0	0	0	0	0	482	501	0	0	0	486	309	**2399**
7:30 AM	8:30 AM	0	389	0	207	0	0	0	0	0	474	468	0	0	0	473	289	**2300**
7:45 AM	8:45 AM	0	321	0	188	0	0	0	0	0	444	441	0	0	0	459	233	**2086**
8:00 AM	9:00 AM	0	258	0	171	0	0	0	0	0	394	423	0	0	0	420	206	**1872**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	423	0	198	0	0	0	0	0	482	501	0	0	0	486	309	**2399**
PHF BY MOVEMENT	0.00	0.82	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.77	0.85	0.00	0.00	0.00	0.90	0.79	OVERALL
PHF BY APPROACH	0.83				0.00				0.87				0.91				0.88
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	15		41		0		0		42		18		25		23		**82**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				1				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				1				0				0				**1**

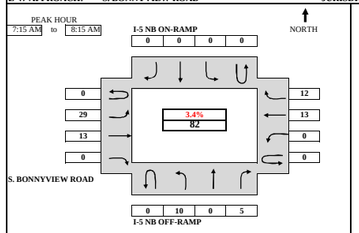
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

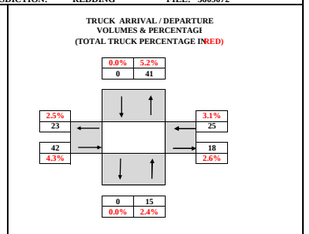
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 NB OFF-RAMP - I-5 NB ON-RAMP — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		4	1							3	6			7	1		**22**
7:15 AM	7:30 AM		7	3							10	8			9	2		**39**
7:30 AM	7:45 AM		9	4							18	10			15	5		**61**
7:45 AM	8:00 AM		13	4							26	17			17	10		**87**
8:00 AM	8:15 AM		14	6							32	19			20	13		**104**
8:15 AM	8:30 AM		19	7							41	20			23	14		**124**
8:30 AM	8:45 AM		19	10							52	22			31	18		**152**
8:45 AM	9:00 AM		20	11							61	26			38	18		**174**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	4	0	1	0	0	0	0	0	3	6	0	0	0	7	1	**22**
7:15 AM	7:30 AM	0	3	0	2	0	0	0	0	0	7	2	0	0	0	2	1	**17**
7:30 AM	7:45 AM	0	2	0	1	0	0	0	0	0	8	2	0	0	0	6	3	**22**
7:45 AM	8:00 AM	0	4	0	0	0	0	0	0	0	8	7	0	0	0	2	5	**26**
8:00 AM	8:15 AM	0	1	0	2	0	0	0	0	0	6	2	0	0	0	3	3	**17**
8:15 AM	8:30 AM	0	5	0	1	0	0	0	0	0	9	1	0	0	0	3	1	**20**
8:30 AM	8:45 AM	0	0	0	3	0	0	0	0	0	11	2	0	0	0	8	4	**28**
8:45 AM	9:00 AM	0	1	0	1	0	0	0	0	0	9	4	0	0	0	7	0	**22**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	13	0	4	0	0	0	0	0	26	17	0	0	0	17	10	**87**
7:15 AM	8:15 AM	0	10	0	5	0	0	0	0	0	29	13	0	0	0	13	12	**82**
7:30 AM	8:30 AM	0	12	0	4	0	0	0	0	0	31	12	0	0	0	14	12	**85**
7:45 AM	8:45 AM	0	10	0	6	0	0	0	0	0	34	12	0	0	0	16	13	**91**
8:00 AM	9:00 AM	0	7	0	7	0	0	0	0	0	35	9	0	0	0	21	8	**87**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

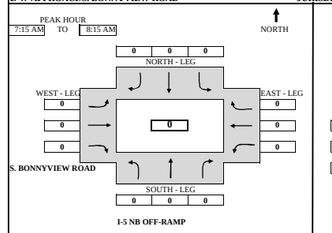
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	15	41	0	0	42	18	25	23	82
TRUCK PERCENTAGE	2.4%	5.2%	0.0%	0.0%	4.3%	2.6%	3.1%	2.5%	3.4%

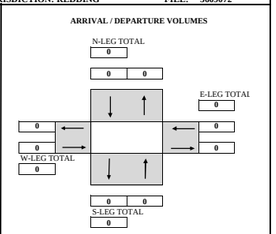
B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 NB OFF-RAMP - I-5 NB ON-RAMP — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

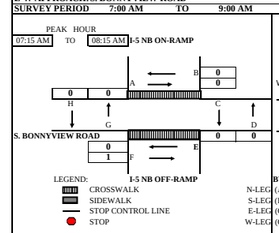
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

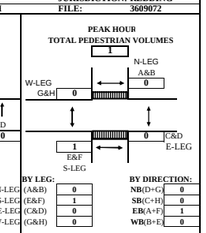
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: I-5 NB OFF-RAMP - I-5 NB ON-RAMP — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM





LEGEND: CROSSWALK, SIDEWALK, STOP CONTROL LINE, STOP

BY LEG:	
N-LEG (A&B)	0
S-LEG (E&F)	1
E-LEG (C&D)	0
W-LEG (G&H)	0

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	0
EB(A+F)	1
WB(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	1	0	0	***1***
07:30 AM	--- 07:45 AM	0	0	0	0	0	1	0	0	***1***
07:45 AM	--- 08:00 AM	0	0	0	0	0	1	0	0	***1***
08:00 AM	--- 08:15 AM	0	0	0	0	0	1	0	0	***1***
08:15 AM	--- 08:30 AM	0	0	0	0	0	1	0	0	***1***
08:30 AM	--- 08:45 AM	0	0	0	0	0	1	0	0	***1***
08:45 AM	--- 09:00 AM	0	0	0	0	0	1	0	0	***1***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	1	0	0	***1***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	1	0	0	***1***
07:15 AM	--- 08:15 AM	0	0	0	0	0	1	0	0	***1***
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

7:15 AM to 8:15 AM

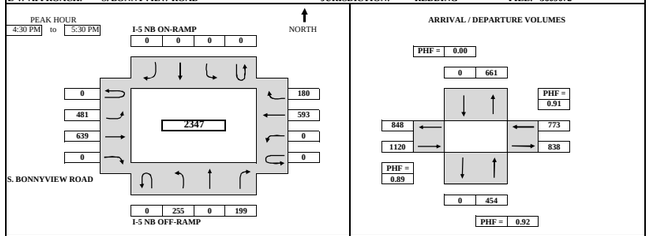
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	1	0	**1**

VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	1	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 NB OFF-RAMP – I-5 NB ON-RAMP — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		57		55						103	131			147	35		**528**
4:15 PM	4:30 PM		120		103						214	253			299	66		**1055**
4:30 PM	4:45 PM		187		139						327	394			446	105		**1598**
4:45 PM	5:00 PM		264		186						444	547			592	150		**2183**
5:00 PM	5:15 PM		329		239						569	735			727	199		**2798**
5:15 PM	5:30 PM		375		302						695	892			892	246		**3402**
5:30 PM	5:45 PM		414		356						814	1023			999	290		**3896**
5:45 PM	6:00 PM		471		395						905	1165			1108	321		**4365**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	57	0	55	0	0	0	0	0	103	131	0	0	0	147	35	**528**
4:15 PM	4:30 PM	0	63	0	48	0	0	0	0	0	111	122	0	0	0	152	31	**527**
4:30 PM	4:45 PM	0	67	0	36	0	0	0	0	0	113	141	0	0	0	147	39	**543**
4:45 PM	5:00 PM	0	77	0	47	0	0	0	0	0	117	153	0	0	0	146	45	**585**
5:00 PM	5:15 PM	0	65	0	53	0	0	0	0	0	125	188	0	0	0	135	49	**615**
5:15 PM	5:30 PM	0	46	0	63	0	0	0	0	0	126	157	0	0	0	165	47	**604**
5:30 PM	5:45 PM	0	39	0	54	0	0	0	0	0	119	131	0	0	0	107	44	**494**
5:45 PM	6:00 PM	0	57	0	39	0	0	0	0	0	91	142	0	0	0	109	31	**469**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	264	0	186	0	0	0	0	0	444	547	0	0	0	592	150	**2183**
4:15 PM	5:15 PM	0	272	0	184	0	0	0	0	0	466	604	0	0	0	580	164	**2270**
4:30 PM	5:30 PM	0	255	0	199	0	0	0	0	0	481	639	0	0	0	593	180	**2347**
4:45 PM	5:45 PM	0	227	0	217	0	0	0	0	0	487	629	0	0	0	553	185	**2298**
5:00 PM	6:00 PM	0	207	0	209	0	0	0	0	0	461	618	0	0	0	516	171	**2182**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM

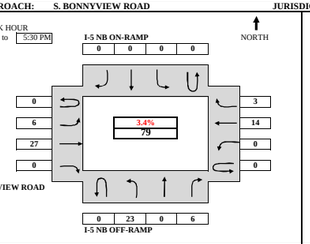
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	255	0	199	0	0	0	0	0	481	639	0	0	0	593	180	**2347**
PHF BY MOVEMENT	0.00	0.83	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.95	0.85	0.00	0.00	0.00	0.90	0.92	OVERALL
PHF BY APPROACH		0.92				0.00				0.89				0.91			0.95
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	29		9		0		0		33		33		17		37		**79**
TRUCK PERCENTAGE	6.4%		1.4%		0.0%		0.0%		2.9%		3.9%		2.2%		4.4%		**3.4%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				2				1				**3**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				3				0				0				**3**

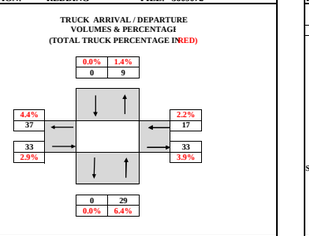
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 NB OFF-RAMP – I-5 NB ON-RAMP — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		2		3						5	1			5	0		**16**
4:15 PM	4:30 PM		5		5						12	5			9	1		**37**
4:30 PM	4:45 PM		10		7						15	11			10	2		**55**
4:45 PM	5:00 PM		17		8						17	18			16	2		**78**
5:00 PM	5:15 PM		25		10						17	23			20	3		**98**
5:15 PM	5:30 PM		28		11						18	32			23	4		**116**
5:30 PM	5:45 PM		34		11						21	34			23	5		**128**
5:45 PM	6:00 PM		39		12						23	38			26	7		**145**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	2	0	3	0	0	0	0	0	5	1	0	0	5	0	0	**16**
4:15 PM	4:30 PM	0	3	0	2	0	0	0	0	0	7	4	0	0	4	1	0	**21**
4:30 PM	4:45 PM	0	5	0	2	0	0	0	0	0	3	6	0	0	1	1	0	**18**
4:45 PM	5:00 PM	0	7	0	1	0	0	0	0	0	2	7	0	0	6	0	0	**23**
5:00 PM	5:15 PM	0	8	0	2	0	0	0	0	0	0	5	0	0	4	1	0	**20**
5:15 PM	5:30 PM	0	3	0	1	0	0	0	0	0	1	9	0	0	3	1	0	**18**
5:30 PM	5:45 PM	0	6	0	0	0	0	0	0	0	3	2	0	0	0	1	0	**12**
5:45 PM	6:00 PM	0	5	0	1	0	0	0	0	0	2	4	0	0	3	2	0	**17**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	17	0	8	0	0	0	0	0	17	18	0	0	16	2	0	**78**
4:15 PM	5:15 PM	0	23	0	7	0	0	0	0	0	12	22	0	0	15	3	0	**82**
4:30 PM	5:30 PM	0	23	0	6	0	0	0	0	0	6	27	0	0	14	3	0	**79**
4:45 PM	5:45 PM	0	24	0	4	0	0	0	0	0	6	23	0	0	13	3	0	**73**
5:00 PM	6:00 PM	0	22	0	4	0	0	0	0	0	6	20	0	0	10	5	0	**67**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

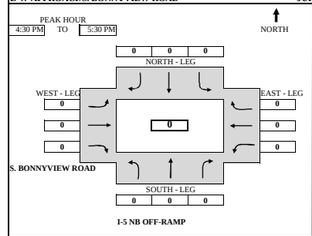
4:30 PM to 5:30 PM

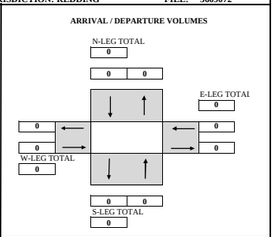
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	29	9	0	0	33	33	17	37	79
TRUCK PERCENTAGE	6.4%	1.4%	0.0%	0.0%	2.9%	3.9%	2.2%	4.4%	3.4%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: I-5 NB OFF-RAMP – I-5 NB ON-RAMP — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

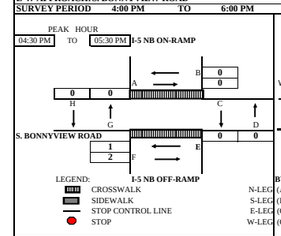
4:30 PM to 5:30 PM

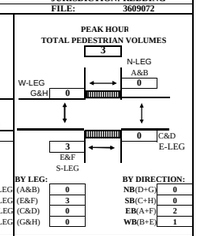
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: I-5 NB OFF-RAMP – I-5 NB ON-RAMP — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





BY LEG:

N-LEG (A&B)	0
S-LEG (E&F)	3
E-LEG (C&D)	0
W-LEG (G&H)	0

BY DIRECTION:

NB(D+G)	0
SB(C+H)	0
EB(A+F)	2
WB(B+E)	1

TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	1	0	0	1	0	0	0	*2*
04:30 PM	---	04:45 PM	0	1	0	0	1	1	0	0	*3*
04:45 PM	---	05:00 PM	0	1	0	0	1	1	0	0	*3*
05:00 PM	---	05:15 PM	0	1	0	0	2	2	0	0	*5*
05:15 PM	---	05:30 PM	0	1	0	0	2	2	0	0	*5*
05:30 PM	---	05:45 PM	0	1	0	0	2	2	0	0	*5*
05:45 PM	---	06:00 PM	0	2	0	0	2	2	0	0	*6*
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	1	0	0	1	0	0	0	*2*
04:30 PM	---	04:45 PM	0	0	0	0	1	0	0	0	*1*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	05:15 PM	0	0	0	0	1	1	0	0	*2*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	---	06:00 PM	0	1	0	0	0	0	0	0	*1*
HOURLY TOTALS											
04:00 PM	---	05:00 PM	0	1	0	0	1	1	0	0	*3*
04:15 PM	---	05:15 PM	0	1	0	0	2	2	0	0	*5*
04:30 PM	---	05:30 PM	0	0	0	0	1	2	0	0	*3*
04:45 PM	---	05:45 PM	0	0	0	0	1	1	0	0	*2*
05:00 PM	---	06:00 PM	0	1	0	0	1	1	0	0	*3*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

4:30 PM to 5:30 PM

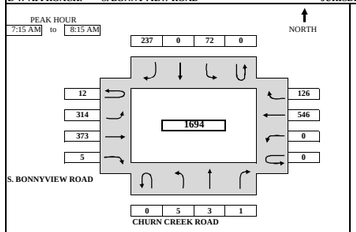
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	2	1	**3**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	3	0	0	**3**

B.A.Y.M.E.T.R.I.C.S.

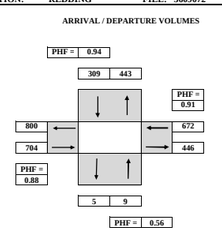
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		1	0	0	0	12	0	53	0	67	50	0		82	36		**301**
7:15 AM	7:30 AM		2	1	0	0	31	0	113	2	153	135	1		216	87		**741**
7:30 AM	7:45 AM		3	1	1	0	44	0	182	7	243	237	3		355	111		**1187**
7:45 AM	8:00 AM		5	3	1	0	61	0	243	12	318	328	5		501	136		**1613**
8:00 AM	8:15 AM		6	3	1	0	84	0	290	12	381	423	5		628	162		**1995**
8:15 AM	8:30 AM		6	3	3	1	96	0	347	12	454	499	6		728	175		**2330**
8:30 AM	8:45 AM		15	4	4	1	111	0	394	12	511	590	10		826	187		**2665**
8:45 AM	9:00 AM		17	5	6	1	129	2	427	12	570	684	13		921	198		**2985**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	1	0	0	0	12	0	53	0	67	50	0	0	82	36		**301**
7:15 AM	7:30 AM	0	1	1	0	0	19	0	60	2	86	85	1	0	134	51		**440**
7:30 AM	7:45 AM	0	1	0	1	0	13	0	69	5	90	102	2	0	139	24		**446**
7:45 AM	8:00 AM	0	2	2	0	0	17	0	61	5	75	91	2	0	146	25		**426**
8:00 AM	8:15 AM	0	1	0	0	0	23	0	47	0	63	95	0	0	127	26		**382**
8:15 AM	8:30 AM	0	0	0	2	1	12	0	57	0	73	76	1	0	100	13		**335**
8:30 AM	8:45 AM	0	9	1	1	0	15	0	47	0	57	91	4	0	98	12		**335**
8:45 AM	9:00 AM	0	2	1	2	0	18	2	33	0	59	94	3	0	95	11		**320**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	5	3	1	0	61	0	243	12	318	328	5	0	0	501	136	**1613**
7:15 AM	8:15 AM	0	5	3	1	0	72	0	237	12	314	373	5	0	0	546	126	**1694**
7:30 AM	8:30 AM	0	4	2	3	1	65	0	234	10	301	364	5	0	0	512	88	**1589**
7:45 AM	8:45 AM	0	12	3	3	1	67	0	212	5	268	353	7	0	0	471	76	**1478**
8:00 AM	9:00 AM	0	12	2	5	1	68	2	184	0	252	356	8	0	0	420	62	**1372**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	5	3	1	0	72	0	237	12	314	373	5	0	0	546	126	**1694**
PHF BY MOVEMENT	0.00	0.63	0.38	0.25	0.00	0.78	0.00	0.86	0.60	0.87	0.91	0.63	0.00	0.00	0.93	0.62	OVERALL
PHF BY APPROACH	0.56				0.94				0.88				0.91				0.95
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	1		7		4		0		17		12		19		22		**41**
TRUCK PERCENTAGE	11.1%		1.6%		1.3%		0.0%		2.4%		2.7%		2.8%		2.8%		**2.4%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	3				1				2				1				**7**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	2				1				4				0				**7**

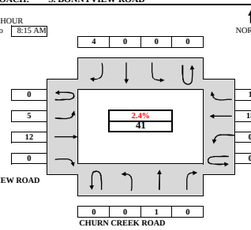
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

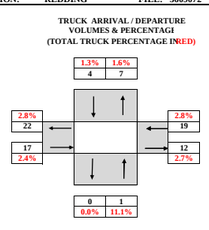
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE INCED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0				2	0	2		1	3			5	1		**14**
7:15 AM	7:30 AM		0				2	0	2		2	7			10	1		**24**
7:30 AM	7:45 AM		0				2	0	3		4	9			14	1		**33**
7:45 AM	8:00 AM		1				2	0	4		6	11			16	2		**42**
8:00 AM	8:15 AM		1				2	0	6		6	15			23	2		**55**
8:15 AM	8:30 AM		1				2	0	7		6	17			25	2		**60**
8:30 AM	8:45 AM		1				3	0	10		7	20			32	2		**75**
8:45 AM	9:00 AM		1				4	0	11		8	25			37	2		**88**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	2	0	2	0	1	3	0	0	5	1		**14**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0		**10**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	1	0	2	2	0	0	4	0		**9**
7:45 AM	8:00 AM	0	0	1	0	0	0	0	1	0	2	2	0	0	2	1		**9**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	2	0	0	4	0	0	7	0		**13**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	2	0		**5**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	3	0	1	3	0	0	7	0		**15**
8:45 AM	9:00 AM	0	0	0	0	0	1	0	1	0	1	5	0	0	5	0		**13**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	1	0	0	2	0	4	0	6	11	0	0	0	16	2	**42**
7:15 AM	8:15 AM	0	0	1	0	0	0	0	4	0	5	12	0	0	0	18	1	**41**
7:30 AM	8:30 AM	0	0	1	0	0	0	0	5	0	4	10	0	0	0	15	1	**36**
7:45 AM	8:45 AM	0	0	1	0	0	1	0	7	0	3	11	0	0	0	18	1	**42**
8:00 AM	9:00 AM	0	0	0	0	0	2	0	7	0	2	14	0	0	0	21	0	**46**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

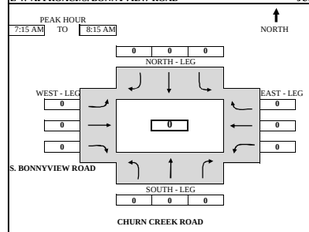
7:15 AM to 8:15 AM

DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	1	7	4	0	17	12	19	22	41
TRUCK PERCENTAGE	11.1%	1.6%	1.3%	0.0%	2.4%	2.7%	2.8%	2.8%	2.4%

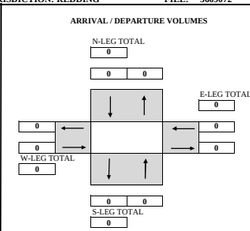
B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

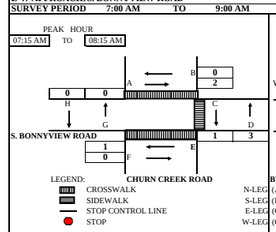
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

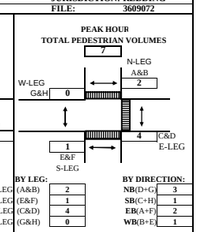
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:		BY DIRECTION:	
N-LEG	(A&B) 2	NB	(D+G) 3
S-LEG	(E&F) 1	SB	(C+H) 1
E-LEG	(C&D) 4	EB	(A+F) 2
W-LEG	(G&H) 0	WB	(B+E) 1

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	1	1	1	0	0	0	***3***
07:45 AM	--- 08:00 AM	2	0	1	1	1	0	0	0	***5***
08:00 AM	--- 08:15 AM	2	0	1	3	1	0	0	0	***7***
08:15 AM	--- 08:30 AM	2	0	2	3	1	2	0	0	***10***
08:30 AM	--- 08:45 AM	2	0	2	3	1	2	0	0	***10***
08:45 AM	--- 09:00 AM	2	0	2	3	1	2	0	0	***10***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	1	1	1	0	0	0	***3***
07:45 AM	--- 08:00 AM	2	0	0	0	0	0	0	0	***2***
08:00 AM	--- 08:15 AM	0	0	0	2	0	0	0	0	***2***
08:15 AM	--- 08:30 AM	0	0	1	0	0	2	0	0	***3***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	2	0	1	1	1	0	0	0	***5***
07:15 AM	--- 08:15 AM	2	0	1	3	1	0	0	0	***7***
07:30 AM	--- 08:30 AM	2	0	2	3	1	2	0	0	***10***
07:45 AM	--- 08:45 AM	2	0	1	2	0	2	0	0	***7***
08:00 AM	--- 09:00 AM	2	0	1	2	0	2	0	0	***5***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

7:15 AM to 8:15 AM

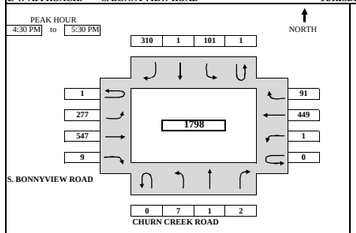
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	3	1	2	1	**7**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	2	1	4	0	**7**

B.A.Y.M.E.T.R.I.C.S.

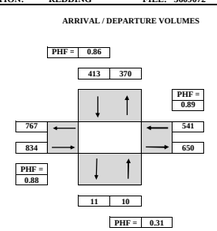
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: CHURN CREEK ROAD **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	2	0	0	19	1	83	1	48	128	1		1	99	21	**404**
4:15 PM	4:30 PM		0	2	0	0	44	2	153	1	106	225	1		1	206	36	**777**
4:30 PM	4:45 PM		0	3	1	0	66	2	221	1	169	348	3		2	319	52	**1187**
4:45 PM	5:00 PM		0	3	1	0	89	2	318	1	235	478	3		2	416	71	**1619**
5:00 PM	5:15 PM		0	3	1	0	114	3	387	1	307	640	7		2	530	100	**2095**
5:15 PM	5:30 PM		7	3	2	1	145	3	463	2	383	772	10		2	655	127	**2575**
5:30 PM	5:45 PM		8	3	2	1	166	4	525	2	444	890	11		5	745	147	**2953**
5:45 PM	6:00 PM		8	4	3	2	180	4	578	3	502	1004	13		5	824	164	**3294**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	2	0	0	19	1	83	1	48	128	1	0	1	99	21	**404**
4:15 PM	4:30 PM	0	0	0	0	0	25	1	70	0	58	97	0	0	0	107	15	**373**
4:30 PM	4:45 PM	0	0	1	1	0	22	0	68	0	63	123	2	0	1	113	16	**410**
4:45 PM	5:00 PM	0	0	0	0	0	23	0	97	0	66	130	0	0	0	97	19	**432**
5:00 PM	5:15 PM	0	0	0	0	0	25	1	69	0	72	162	4	0	0	114	29	**476**
5:15 PM	5:30 PM	0	7	0	1	1	31	0	76	1	76	132	3	0	0	125	27	**480**
5:30 PM	5:45 PM	0	1	0	0	0	21	1	62	0	61	118	1	0	3	90	20	**378**
5:45 PM	6:00 PM	0	0	1	1	1	14	0	53	1	58	114	2	0	0	79	17	**341**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	3	1	0	89	2	318	1	235	478	3	0	2	416	71	**1619**
4:15 PM	5:15 PM	0	0	1	1	0	95	2	304	0	259	512	6	0	1	431	79	**1691**
4:30 PM	5:30 PM	0	7	1	2	1	101	1	310	1	277	547	9	0	1	449	91	**1798**
4:45 PM	5:45 PM	0	8	0	1	1	100	2	304	1	275	542	8	0	3	426	95	**1766**
5:00 PM	6:00 PM	0	8	1	2	2	91	2	260	2	267	526	10	0	3	408	93	**1675**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	7	1	2	1	101	1	310	1	277	547	9	0	1	449	91	**1798**
PHF BY MOVEMENT	0.00	0.25	0.25	0.50	0.25	0.81	0.25	0.80	0.25	0.91	0.84	0.56	0.00	0.25	0.90	0.78	OVERALL
PHF BY APPROACH	0.31				0.86				0.88				0.89				0.94
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		10		7		2		33		22		9		15		**49**
TRUCK PERCENTAGE	0.0%		2.7%		1.7%		18.2%		4.0%		3.4%		1.7%		2.0%		**2.7%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	4				5				0				3				**12**
	N-LEG				S-LEG				E-LEG				W-LEG				
PEDESTRIAN BY DIR	3				0				9				0				**12**

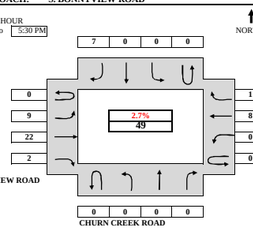
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

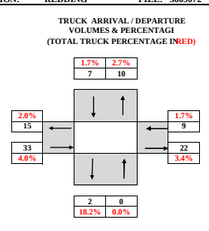
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: CHURN CREEK ROAD **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN(ED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						0	1			0	3	0		4	1		**9**
4:15 PM	4:30 PM						0	1			0	8	0		6	1		**16**
4:30 PM	4:45 PM						0	1			1	15	1		7	1		**26**
4:45 PM	5:00 PM						0	4			4	20	1		11	1		**41**
5:00 PM	5:15 PM						0	6			5	27	1		13	1		**53**
5:15 PM	5:30 PM						0	8			9	30	2		14	2		**65**
5:30 PM	5:45 PM						1	11			13	30	2		16	2		**75**
5:45 PM	6:00 PM						1	12			14	33	2		19	2		**83**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	1	0	0	3	0	0	4	1	0	**9**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	2	0	0	**7**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	1	7	1	0	1	1	0	**10**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	3	0	3	5	0	0	4	0	0	**15**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	2	0	1	7	0	0	2	0	0	**12**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	2	0	4	3	1	0	0	1	1	**12**
5:30 PM	5:45 PM	0	0	0	0	0	1	0	3	0	4	0	0	0	2	0	0	**10**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	3	0	**8**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	0	0	4	0	4	20	1	0	0	11	1	**41**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	5	0	5	24	1	0	0	9	0	**44**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	7	0	9	22	2	0	0	8	1	**49**
4:45 PM	5:45 PM	0	0	0	0	0	1	0	10	0	12	15	1	0	0	9	1	**49**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	8	0	10	13	1	0	0	8	1	**42**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

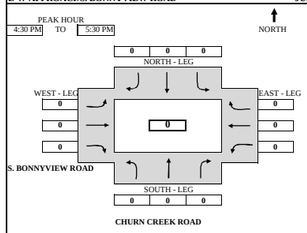
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	10	7	2	33	22	9	15	49
TRUCK PERCENTAGE	0.0%	2.7%	1.7%	18.2%	4.0%	3.4%	1.7%	2.0%	2.7%

B.A.Y.M.E.T.R.I.C.S.

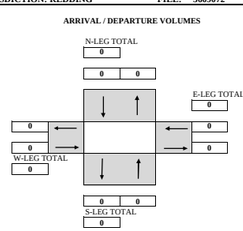
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: CHURN CREEK ROAD **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

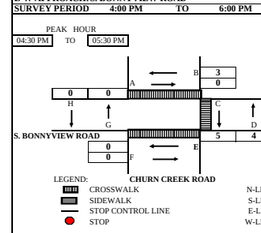
4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

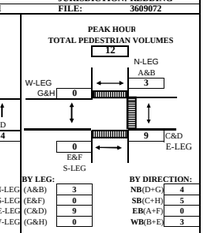
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016
N-S APPROACH: CHURN CREEK ROAD **DAY:** TUESDAY
E-W APPROACH: S. BONNYVIEW ROAD **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM **TO** 6:00 PM **FILE:** 3609072

PEAK HOUR 04:30 PM TO 05:30 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



LEGEND:
CROSSWALK
SIDEWALK
STOP CONTROL LINE
STOP

CHURN CREEK ROAD

BY LEG:	
N-LEG (A&B)	3
S-LEG (E&F)	0
E-LEG (C&D)	9
W-LEG (G&H)	0

BY DIRECTION:	
NB(D+G)	4
SB(C+H)	5
EB(A+F)	0
WB(B+E)	3

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	1	0	1	0	0	0	0	***2***
04:15 PM	--- 04:30 PM	0	1	0	1	0	1	0	0	***3***
04:30 PM	--- 04:45 PM	0	2	2	2	0	1	0	0	***7***
04:45 PM	--- 05:00 PM	0	3	2	3	0	1	0	0	***9***
05:00 PM	--- 05:15 PM	0	3	4	4	0	1	0	0	***12***
05:15 PM	--- 05:30 PM	0	4	5	5	0	1	0	0	***15***
05:30 PM	--- 05:45 PM	2	5	6	5	0	1	0	0	***19***
05:45 PM	--- 06:00 PM	2	5	6	5	0	1	0	0	***19***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	1	0	1	0	0	0	0	***2***
04:15 PM	--- 04:30 PM	0	0	0	0	0	1	0	0	***1***
04:30 PM	--- 04:45 PM	0	1	2	1	0	0	0	0	***4***
04:45 PM	--- 05:00 PM	0	1	0	1	0	0	0	0	***2***
05:00 PM	--- 05:15 PM	0	0	2	1	0	0	0	0	***3***
05:15 PM	--- 05:30 PM	0	1	1	1	0	0	0	0	***3***
05:30 PM	--- 05:45 PM	2	1	1	0	0	0	0	0	***4***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	3	2	3	0	1	0	0	***9***
04:15 PM	--- 05:15 PM	0	2	4	3	0	1	0	0	***10***
04:30 PM	--- 05:30 PM	0	3	5	4	0	0	0	0	***12***
04:45 PM	--- 05:45 PM	2	3	4	3	0	0	0	0	***12***
05:00 PM	--- 06:00 PM	2	2	4	2	0	0	0	0	***10***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

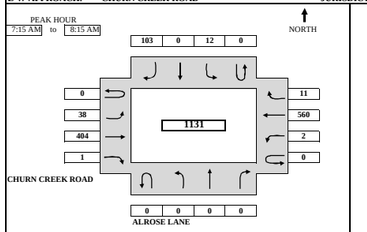
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	4	5	0	3	**12**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	3	0	9	0	**12**

B.A.Y.M.E.T.R.I.C.S.

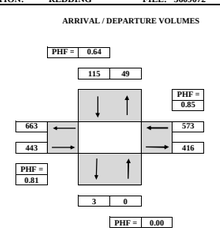
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: ALROSE LANE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM					2	17			5	55	1		1	113	5		**199**
7:15 AM	7:30 AM					7	32			9	144	1		2	254	9		**458**
7:30 AM	7:45 AM					9	58			18	251	1		2	419	12		**770**
7:45 AM	8:00 AM					13	99			30	374	2		2	552	15		**1087**
8:00 AM	8:15 AM					14	120			43	459	2		3	673	16		**1330**
8:15 AM	8:30 AM					20	135			53	542	2		3	781	25		**1561**
8:30 AM	8:45 AM					22	148			68	636	4		4	869	30		**1781**
8:45 AM	9:00 AM					26	165			82	711	5		4	960	37		**1990**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	2	0	17	0	5	55	1	0	1	113	5	**199**
7:15 AM	7:30 AM	0	0	0	0	0	5	0	15	0	4	89	0	0	1	141	4	**259**
7:30 AM	7:45 AM	0	0	0	0	0	2	0	26	0	9	107	0	0	0	165	3	**312**
7:45 AM	8:00 AM	0	0	0	0	0	4	0	41	0	12	123	1	0	0	133	3	**317**
8:00 AM	8:15 AM	0	0	0	0	0	1	0	21	0	13	85	0	0	1	121	1	**243**
8:15 AM	8:30 AM	0	0	0	0	0	6	0	15	0	10	83	0	0	0	108	9	**231**
8:30 AM	8:45 AM	0	0	0	0	0	2	0	13	0	15	94	2	0	1	88	5	**220**
8:45 AM	9:00 AM	0	0	0	0	0	4	0	17	0	14	75	1	0	0	91	7	**209**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	13	0	99	0	30	374	2	0	2	552	15	**1087**
7:15 AM	8:15 AM	0	0	0	0	0	12	0	103	0	38	404	1	0	2	560	11	**1131**
7:30 AM	8:30 AM	0	0	0	0	0	13	0	103	0	44	398	1	0	1	527	16	**1103**
7:45 AM	8:45 AM	0	0	0	0	0	13	0	90	0	50	385	3	0	2	450	18	**1011**
8:00 AM	9:00 AM	0	0	0	0	0	13	0	66	0	52	337	3	0	2	408	22	**903**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	12	0	103	0	38	404	1	0	2	560	11	**1131**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.63	0.00	0.73	0.82	0.25	0.00	0.50	0.85	0.69	OVERALL
PHF BY APPROACH	0.00				0.64				0.81				0.85				0.89
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		3		1		0		18		18		23		21		**42**
TRUCK PERCENTAGE	0.0%		6.1%		0.9%		0.0%		4.1%		4.3%		4.0%		3.2%		**3.7%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

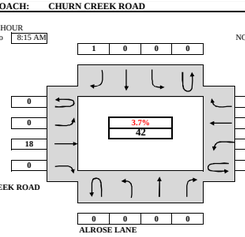
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

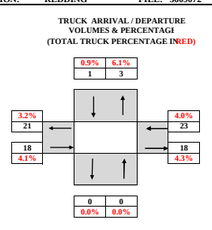
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: ALROSE LANE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM					1				3				5	0			**9**
7:15 AM	7:30 AM					1				6				9	2			**18**
7:30 AM	7:45 AM					2				11				15	2			**30**
7:45 AM	8:00 AM					2				15				20	2			**39**
8:00 AM	8:15 AM					2				21				25	3			**51**
8:15 AM	8:30 AM					2				22				27	4			**55**
8:30 AM	8:45 AM					2				27				35	4			**68**
8:45 AM	9:00 AM					2				32				40	4			**78**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	1	0	0	3	0	0	0	5	0	**9**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	3	0	0	0	4	2	**9**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	1	0	0	5	0	0	0	6	0	**12**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	**9**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	5	1	**12**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	1	**4**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	8	0	**13**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	**10**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	0	0	2	0	0	15	0	0	0	20	2	**39**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	1	0	0	18	0	0	0	20	3	**42**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	16	0	0	0	18	2	**37**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	16	0	0	0	20	2	**38**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	17	0	0	0	20	2	**39**

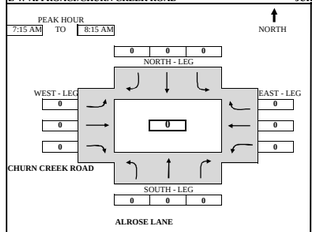
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	3	1	0	18	18	23	21	42
TRUCK PERCENTAGE	0.0%	6.1%	0.9%	0.0%	4.1%	4.3%	4.0%	3.2%	3.7%

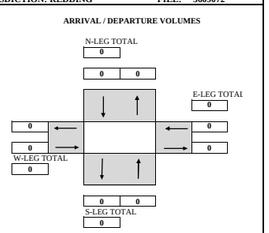
B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: ALROSE LANE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

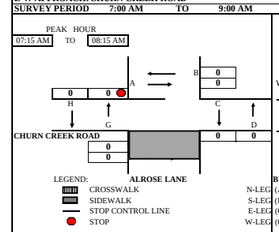
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: ALROSE LANE — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

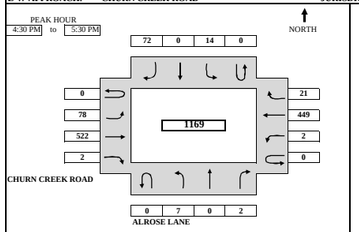
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

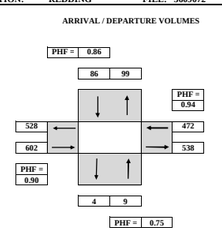
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: ALROSE LANE **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD **JURISDICTION:** REDDING **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		1	0	0		2	11			17	119	0		1	100	4	**255**
4:15 PM	4:30 PM		1	0	1		7	28			38	236	0		1	201	10	**523**
4:30 PM	4:45 PM		2	0	2		11	41			66	347	1		2	320	15	**807**
4:45 PM	5:00 PM		4	0	2		13	64			85	474	1		2	427	21	**1093**
5:00 PM	5:15 PM		7	0	2		18	81			107	619	1		2	540	25	**1402**
5:15 PM	5:30 PM		8	0	3		21	100			116	758	2		3	650	31	**1692**
5:30 PM	5:45 PM		10	0	3		27	118			135	875	4		4	741	38	**1955**
5:45 PM	6:00 PM		10	0	4		31	127			158	983	7		4	830	44	**2198**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	1	0	0	0	2	0	11	0	17	119	0	0	1	100	4	**255**
4:15 PM	4:30 PM	0	0	0	1	0	5	0	17	0	21	117	0	0	0	101	6	**268**
4:30 PM	4:45 PM	0	1	0	1	0	4	0	13	0	28	111	1	0	1	119	5	**284**
4:45 PM	5:00 PM	0	2	0	0	0	2	0	23	0	19	127	0	0	0	107	6	**286**
5:00 PM	5:15 PM	0	3	0	0	0	5	0	17	0	22	145	0	0	0	113	4	**309**
5:15 PM	5:30 PM	0	1	0	1	0	3	0	19	0	9	139	1	0	1	110	6	**290**
5:30 PM	5:45 PM	0	2	0	0	0	6	0	18	0	19	117	2	0	1	91	7	**263**
5:45 PM	6:00 PM	0	0	0	1	0	4	0	9	0	23	108	3	0	0	89	6	**243**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	4	0	2	0	13	0	64	0	85	474	1	0	2	427	21	**1093**
4:15 PM	5:15 PM	0	6	0	2	0	16	0	70	0	90	500	1	0	1	440	21	**1147**
4:30 PM	5:30 PM	0	7	0	2	0	14	0	72	0	78	522	2	0	2	449	21	**1169**
4:45 PM	5:45 PM	0	8	0	1	0	16	0	77	0	69	528	3	0	2	421	23	**1148**
5:00 PM	6:00 PM	0	6	0	2	0	18	0	63	0	73	509	6	0	2	403	23	**1105**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	7	0	2	0	14	0	72	0	78	522	2	0	2	449	21	**1169**
PHF BY MOVEMENT	0.00	0.58	0.00	0.50	0.00	0.70	0.00	0.78	0.00	0.70	0.90	0.50	0.00	0.50	0.94	0.88	OVERALL
PHF BY APPROACH	0.75				0.86				0.90				0.94				0.95
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		1		1		0		22		22		8		8		**31**
TRUCK PERCENTAGE	0.0%		1.0%		1.2%		0.0%		3.7%		4.1%		1.7%		1.5%		**2.7%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				1				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				1				0				**1**

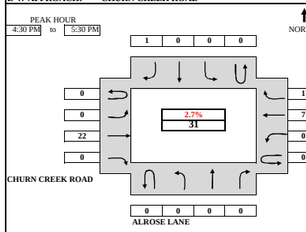
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

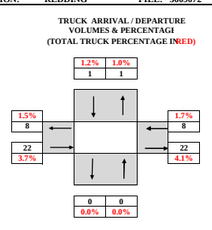
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: ALROSE LANE **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD **JURISDICTION:** REDDING **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						2				4				3	1		**10**
4:15 PM	4:30 PM						2				8				5	1		**16**
4:30 PM	4:45 PM						2				17				6	1		**26**
4:45 PM	5:00 PM						2				21				10	1		**34**
5:00 PM	5:15 PM						3				28				11	1		**43**
5:15 PM	5:30 PM						3				30				12	2		**47**
5:30 PM	5:45 PM						3				30				12	2		**47**
5:45 PM	6:00 PM						3				35				17	2		**57**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	2	0	0	4	0	0	0	3	1	**10**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0	**6**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	1	0	**10**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	**8**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	1	0	0	7	0	0	0	1	0	**9**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	1	**4**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	**10**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	0	0	2	0	0	21	0	0	0	10	1	**34**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	1	0	0	24	0	0	0	8	0	**33**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	1	0	0	22	0	0	0	7	1	**31**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	1	0	0	13	0	0	0	6	1	**21**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	1	0	0	14	0	0	0	7	1	**23**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

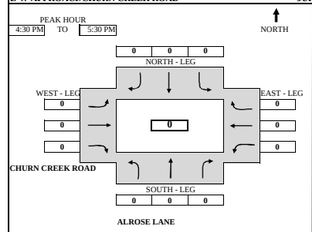
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	1	1	0	22	22	8	8	31
TRUCK PERCENTAGE	0.0%	1.0%	1.2%	0.0%	3.7%	4.1%	1.7%	1.5%	2.7%

B.A.Y.M.E.T.R.I.C.S.

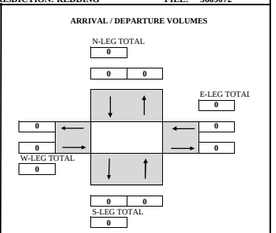
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016 **DAY:** TUESDAY
N-S APPROACH: ALROSE LANE **SURVEY TIME:** 4:00 PM **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD **JURISDICTION:** REDDING **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

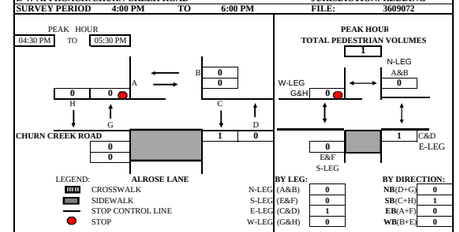
4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/13/2016
N-S APPROACH: ALROSE LANE **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM **FILE:** 3609072

PEAK HOUR 04:30 PM TO 05:30 PM



TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	---	05:15 PM	0	0	1	0	0	0	0	0	***1***
05:15 PM	---	05:30 PM	0	0	1	0	0	0	0	0	***1***
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	---	06:00 PM	0	0	1	0	0	0	0	0	***1***
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	---	05:15 PM	0	0	1	0	0	0	0	0	***1***
05:15 PM	---	05:30 PM	0	0	1	0	0	0	0	0	***1***
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	---	06:00 PM	0	0	1	0	0	0	0	0	***1***
HOURLY TOTALS											
04:00 PM	---	05:00 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	---	05:15 PM	0	0	1	0	0	0	0	0	***1***
04:30 PM	---	05:30 PM	0	0	1	0	0	0	0	0	***1***
04:45 PM	---	05:45 PM	0	0	1	0	0	0	0	0	***1***
05:00 PM	---	06:00 PM	0	0	1	0	0	0	0	0	***1***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

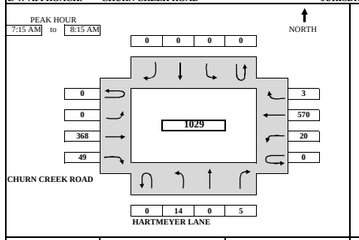
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	1	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

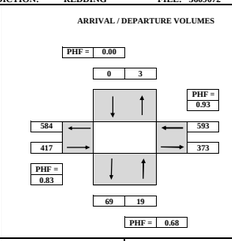
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HARTMEYER LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		2	0							43	11			2	112	0	**170**
7:15 AM	7:30 AM		5	1							122	20			7	265	1	**421**
7:30 AM	7:45 AM		10	3							220	39			11	419	1	**703**
7:45 AM	8:00 AM		14	4							328	56			20	558	2	**982**
8:00 AM	8:15 AM		16	5							411	60			22	682	3	**1199**
8:15 AM	8:30 AM		17	5							488	66			24	785	3	**1388**
8:30 AM	8:45 AM		23	7							576	73			24	878	3	**1584**
8:45 AM	9:00 AM		30	7							653	78			27	963	4	**1762**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	2	0	0	0	0	0	0	0	43	11	0	2	112	0		**170**
7:15 AM	7:30 AM	0	3	0	1	0	0	0	0	0	79	9	0	5	153	1		**251**
7:30 AM	7:45 AM	0	5	0	2	0	0	0	0	0	98	19	0	4	154	0		**282**
7:45 AM	8:00 AM	0	4	0	1	0	0	0	0	0	108	17	0	9	139	1		**279**
8:00 AM	8:15 AM	0	2	0	1	0	0	0	0	0	83	4	0	2	124	1		**217**
8:15 AM	8:30 AM	0	1	0	0	0	0	0	0	0	77	6	0	2	103	0		**189**
8:30 AM	8:45 AM	0	6	0	2	0	0	0	0	0	88	7	0	0	93	0		**196**
8:45 AM	9:00 AM	0	7	0	0	0	0	0	0	0	77	5	0	3	85	1		**178**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	14	0	4	0	0	0	0	0	328	56	0	20	558	2		**982**
7:15 AM	8:15 AM	0	14	0	5	0	0	0	0	0	368	49	0	20	570	3		**1029**
7:30 AM	8:30 AM	0	12	0	4	0	0	0	0	0	366	46	0	17	520	2		**967**
7:45 AM	8:45 AM	0	13	0	4	0	0	0	0	0	356	34	0	13	459	2		**881**
8:00 AM	9:00 AM	0	16	0	3	0	0	0	0	0	325	22	0	7	405	2		**780**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	14	0	5	0	0	0	0	0	0	368	49	0	20	570	3	**1029**
PHF BY MOVEMENT	0.00	0.70	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.64	0.00	0.56	0.93	0.75	OVERALL
PHF BY APPROACH	0.68				0.00				0.83				0.93				0.91
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	6		2		0		3		17		14		25		29		**48**
TRUCK PERCENTAGE	31.6%		66.7%		0.0%		4.3%		4.1%		3.8%		4.2%		5.0%		**4.7%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

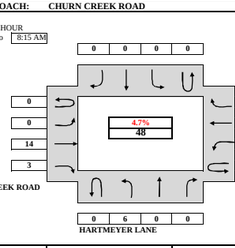
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

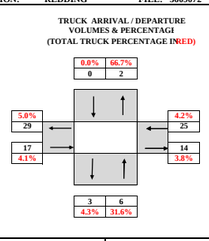
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HARTMEYER LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		1								6	0			5	1		**13**
7:15 AM	7:30 AM		1								8	1			11	1		**22**
7:30 AM	7:45 AM		3								12	2			17	1		**35**
7:45 AM	8:00 AM		5								15	3			21	3		**47**
8:00 AM	8:15 AM		7								20	3			28	3		**61**
8:15 AM	8:30 AM		8								22	3			33	3		**69**
8:30 AM	8:45 AM		13								26	5			40	3		**87**
8:45 AM	9:00 AM		18								30	8			46	3		**105**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	1	0	0	0	0	0	0	0	6	0	0	5	1	0		**13**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	2	1	0	6	0	0		**9**
7:30 AM	7:45 AM	0	2	0	0	0	0	0	0	0	4	1	0	6	0	0		**13**
7:45 AM	8:00 AM	0	2	0	0	0	0	0	0	0	3	1	0	4	2	0		**12**
8:00 AM	8:15 AM	0	2	0	0	0	0	0	0	0	5	0	0	7	0	0		**14**
8:15 AM	8:30 AM	0	1	0	0	0	0	0	0	0	2	0	0	5	0	0		**8**
8:30 AM	8:45 AM	0	5	0	0	0	0	0	0	0	4	2	0	7	0	0		**18**
8:45 AM	9:00 AM	0	5	0	0	0	0	0	0	0	4	3	0	6	0	0		**18**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	5	0	0	0	0	0	0	0	15	3	0	0	21	3		**47**
7:15 AM	8:15 AM	0	6	0	0	0	0	0	0	0	14	3	0	0	23	2		**48**
7:30 AM	8:30 AM	0	7	0	0	0	0	0	0	0	14	2	0	0	22	2		**47**
7:45 AM	8:45 AM	0	10	0	0	0	0	0	0	0	14	3	0	0	23	2		**52**
8:00 AM	9:00 AM	0	13	0	0	0	0	0	0	0	15	5	0	0	25	0		**58**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

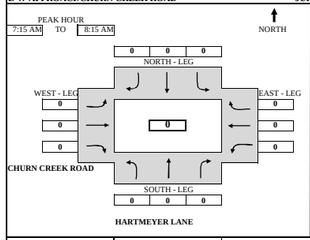
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	6	2	0	3	17	14	25	29	48
TRUCK PERCENTAGE	31.6%	66.7%	0.0%	4.3%	4.1%	3.8%	4.2%	5.0%	4.7%

B.A.Y.M.E.T.R.I.C.S.

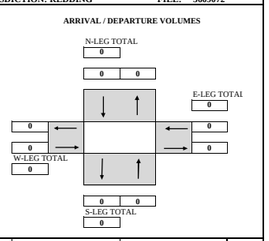
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HARTMEYER LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

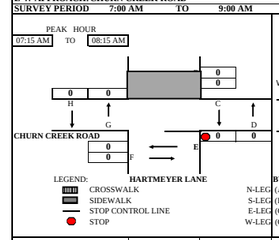
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

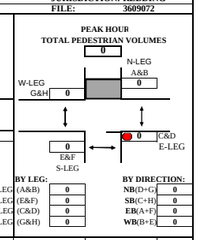
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: HARTMEYER LANE — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:		BY DIRECTION:	
N-LEG	(A&B) 0	NB	(D+G) 0
S-LEG	(E&F) 0	SB	(C+H) 0
E-LEG	(C&D) 0	EB	(A+F) 0
W-LEG	(G&H) 0	WB	(B+E) 0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

7:15 AM to 8:15 AM

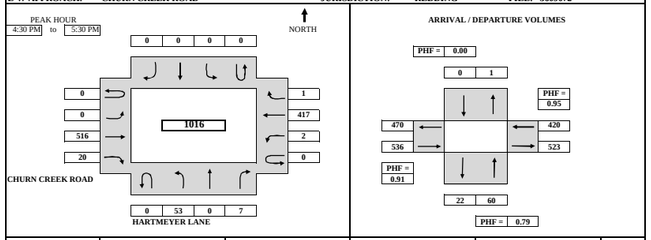
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HARTMEYER LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		9	6							112	4			0	93	0	**224**
4:15 PM	4:30 PM		22	11							228	12			0	188	1	**462**
4:30 PM	4:45 PM		38	13							335	19			1	297	1	**704**
4:45 PM	5:00 PM		47	13							462	22			2	399	1	**946**
5:00 PM	5:15 PM		64	15							606	26			2	497	1	**1211**
5:15 PM	5:30 PM		75	18							744	32			2	605	2	**1478**
5:30 PM	5:45 PM		78	19							861	33			3	703	2	**1699**
5:45 PM	6:00 PM		83	21							981	33			3	788	2	**1911**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	9	0	6	0	0	0	0	0	0	112	4	0	0	93	0	**224**
4:15 PM	4:30 PM	0	13	0	5	0	0	0	0	0	0	116	8	0	0	95	1	**238**
4:30 PM	4:45 PM	0	16	0	2	0	0	0	0	0	0	107	7	0	1	109	0	**242**
4:45 PM	5:00 PM	0	9	0	0	0	0	0	0	0	0	127	3	0	1	102	0	**242**
5:00 PM	5:15 PM	0	17	0	2	0	0	0	0	0	0	144	4	0	0	98	0	**265**
5:15 PM	5:30 PM	0	11	0	3	0	0	0	0	0	0	138	6	0	0	108	1	**267**
5:30 PM	5:45 PM	0	3	0	1	0	0	0	0	0	0	117	1	0	1	98	0	**221**
5:45 PM	6:00 PM	0	5	0	2	0	0	0	0	0	0	120	0	0	0	85	0	**212**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	47	0	13	0	0	0	0	0	0	462	22	0	2	399	1	**946**
4:15 PM	5:15 PM	0	55	0	9	0	0	0	0	0	0	494	22	0	2	404	1	**987**
4:30 PM	5:30 PM	0	53	0	7	0	0	0	0	0	0	516	20	0	2	417	1	**1016**
4:45 PM	5:45 PM	0	40	0	6	0	0	0	0	0	0	526	14	0	2	406	1	**995**
5:00 PM	6:00 PM	0	36	0	8	0	0	0	0	0	0	519	11	0	1	389	1	**965**

PEAK HOUR SUMMARY

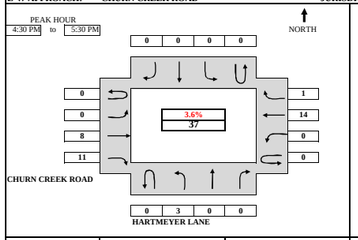
4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	53	0	7	0	0	0	0	0	0	516	20	0	2	417	1	**1016**
PHF BY MOVEMENT	0.00	0.78	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.71	0.00	0.50	0.96	0.25	OVERALL
PHF BY APPROACH		0.79				0.00				0.91				0.95			0.95
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	3		1		0		11		19		8		15		17		**37**
TRUCK PERCENTAGE	5.0%		100.0%		0.0%		50.0%		3.5%		1.5%		3.6%		3.6%		**3.6%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				1				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				1				0				0				**1**

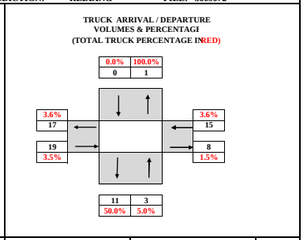
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HARTMEYER LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT*	
SURVEY DATA																		
4:00 PM	4:15 PM		1								3	4			5	1		**14**
4:15 PM	4:30 PM		1								4	5			9	1		**20**
4:30 PM	4:45 PM		1								8	11			13	2		**35**
4:45 PM	5:00 PM		3								10	11			14	2		**40**
5:00 PM	5:15 PM		4								10	15			18	2		**49**
5:15 PM	5:30 PM		4								12	16			23	2		**57**
5:30 PM	5:45 PM		5								13	16			28	2		**64**
5:45 PM	6:00 PM		6								17	16			32	2		**73**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	1	0	0	0	0	0	0	0	0	3	4	0	0	5	1	**14**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4	0	**6**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	4	6	0	0	4	1	**15**
4:45 PM	5:00 PM	0	2	0	0	0	0	0	0	0	0	2	0	0	0	1	0	**5**
5:00 PM	5:15 PM	0	1	0	0	0	0	0	0	0	0	4	0	0	0	4	0	**9**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	5	0	**8**
5:30 PM	5:45 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	5	0	**7**
5:45 PM	6:00 PM	0	1	0	0	0	0	0	0	0	0	4	0	0	0	4	0	**9**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	3	0	0	0	0	0	0	0	0	10	11	0	0	14	2	**40**
4:15 PM	5:15 PM	0	3	0	0	0	0	0	0	0	0	7	11	0	0	13	1	**35**
4:30 PM	5:30 PM	0	3	0	0	0	0	0	0	0	0	8	11	0	0	14	1	**37**
4:45 PM	5:45 PM	0	4	0	0	0	0	0	0	0	0	5	5	0	0	15	0	**29**
5:00 PM	6:00 PM	0	3	0	0	0	0	0	0	0	0	7	5	0	0	18	0	**33**

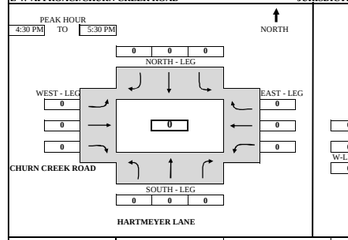
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

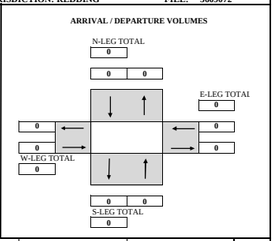
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	3	1	0	11	19	8	15	17	37
TRUCK PERCENTAGE	5.0%	100.0%	0.0%	50.0%	3.5%	1.5%	3.6%	3.6%	3.6%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HARTMEYER LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

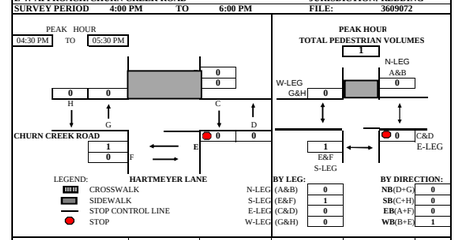
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: HARTMEYER LANE — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	1	0	0	0	***1***
05:30 PM	--- 05:45 PM	0	0	0	0	1	0	0	0	***1***
05:45 PM	--- 06:00 PM	0	0	0	0	2	0	0	0	***2***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	1	0	0	0	***1***
05:30 PM	--- 05:45 PM	0	0	0	0	1	0	0	0	***1***
05:45 PM	--- 06:00 PM	0	0	0	0	2	0	0	0	***2***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 05:30 PM	0	0	0	0	1	0	0	0	***1***
04:45 PM	--- 05:45 PM	0	0	0	0	1	0	0	0	***1***
05:00 PM	--- 06:00 PM	0	0	0	0	2	0	0	0	***2***

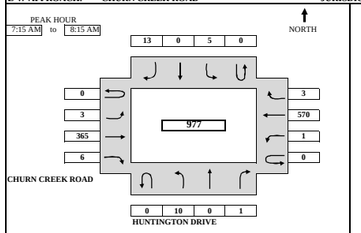
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

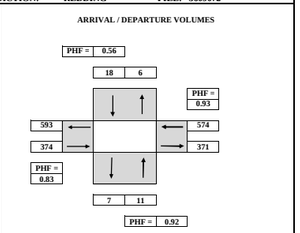
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	1	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	1	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HUNTINGTON DRIVE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		2	0		0	5			1	46	0		0	111	1		166
7:15 AM	7:30 AM		5	0		1	12			30	1	119	1	0	260	3		402
7:30 AM	7:45 AM		7	0		1	14			2	217	1		0	407	3		652
7:45 AM	8:00 AM		9	1		3	15			2	328	3		1	560	4		926
8:00 AM	8:15 AM		12	1		5	18			4	411	6		1	681	4		1143
8:15 AM	8:30 AM		13	1		6	18			5	484	7		2	777	5		1318
8:30 AM	8:45 AM		15	2		8	20			5	568	10		3	875	6		1512
8:45 AM	9:00 AM		16	3		8	22			7	647	14		3	958	6		1684
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	2	0	0	0	0	5		0	1	46	0	0	0	111	1	166
7:15 AM	7:30 AM	0	3	0	0	0	1	7		0	0	73	1	0	0	149	2	236
7:30 AM	7:45 AM	0	2	0	0	0	0	2		0	1	98	0	0	0	147	0	250
7:45 AM	8:00 AM	0	2	0	1	0	2	0	1	0	0	111	2	0	1	153	1	274
8:00 AM	8:15 AM	0	3	0	0	0	2	0	3	0	2	83	3	0	0	121	0	217
8:15 AM	8:30 AM	0	1	0	0	0	1	0	0	0	1	73	1	0	1	96	1	175
8:30 AM	8:45 AM	0	2	0	1	0	2	0	2	0	0	84	3	0	1	98	1	194
8:45 AM	9:00 AM	0	1	0	1	0	0	0	2	0	2	79	4	0	0	83	0	172
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	9	0	1	0	3	0	15	0	2	328	3	0	1	560	4	926
7:15 AM	8:15 AM	0	10	0	1	0	5	0	13	0	3	365	6	0	1	570	3	977
7:30 AM	8:30 AM	0	8	0	1	0	5	0	6	0	4	365	6	0	2	517	2	916
7:45 AM	8:45 AM	0	8	0	2	0	7	0	6	0	3	351	9	0	3	468	3	860
8:00 AM	9:00 AM	0	7	0	2	0	5	0	7	0	5	319	11	0	2	398	2	758

PEAK HOUR SUMMARY

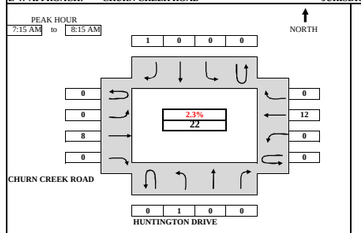
7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	10	0	1	0	5	0	13	0	3	365	6	0	1	570	3	**977**
PHF BY MOVEMENT	0.00	0.83	0.00	0.25	0.00	0.63	0.00	0.46	0.00	0.38	0.82	0.50	0.00	0.25	0.93	0.38	OVERALL
PHF BY APPROACH		0.92				0.56				0.83				0.93			0.89
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	1		0		1		0		8		8		12		14		**22**
TRUCK PERCENTAGE	9.1%		0.0%		5.6%		0.0%		2.1%		2.2%		2.1%		2.4%		**2.3%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

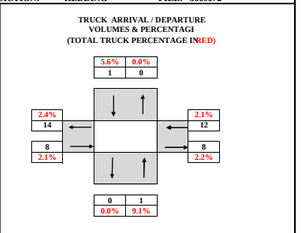
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HUNTINGTON DRIVE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0	0		0	2			1	2	0		0	3	1		9
7:15 AM	7:30 AM		1	0		0	3			1	3	0		0	5	1		14
7:30 AM	7:45 AM		1	0		0	3			1	5	0		0	8	1		19
7:45 AM	8:00 AM		1	0		0	3			1	7	0		0	10	1		23
8:00 AM	8:15 AM		1	0		0	3			1	10	0		0	15	1		31
8:15 AM	8:30 AM		1	0		0	3			1	12	0		0	18	2		37
8:30 AM	8:45 AM		1	0		0	4			1	15	0		1	23	2		47
8:45 AM	9:00 AM		1	1		0	4			1	18	1		1	27	2		56
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	2	0	1	2	0	0	0	3	1	9
7:15 AM	7:30 AM	0	1	0	0	0	0	0	1	0	0	1	0	0	0	2	0	5
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	5
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	4
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	8
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	1	6
8:30 AM	8:45 AM	0	0	0	0	0	0	0	1	0	0	3	0	0	1	5	0	10
8:45 AM	9:00 AM	0	0	0	1	0	0	0	0	0	0	3	1	0	0	4	0	9
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	1	0	0	0	0	0	3	0	1	7	0	0	0	10	1	23
7:15 AM	8:15 AM	0	1	0	0	0	0	0	1	0	0	8	0	0	0	12	0	22
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	13	1	23
7:45 AM	8:45 AM	0	0	0	0	0	0	0	1	0	0	10	0	0	1	15	1	28
8:00 AM	9:00 AM	0	0	0	1	0	0	0	1	0	0	11	1	0	1	17	1	33

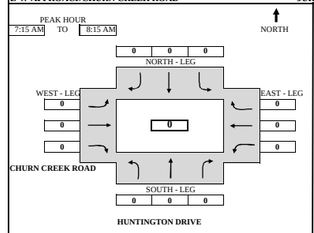
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

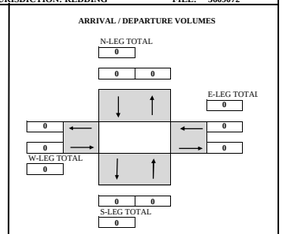
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	1	0	1	0	8	8	12	14	22
TRUCK PERCENTAGE	9.1%	0.0%	5.6%	0.0%	2.1%	2.2%	2.1%	2.4%	2.3%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HUNTINGTON DRIVE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

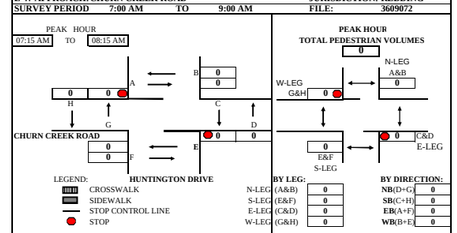
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: HUNTINGTON DRIVE — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

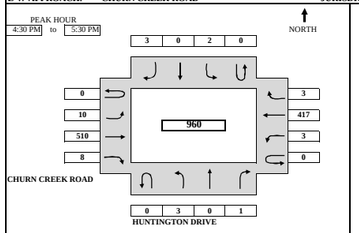
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

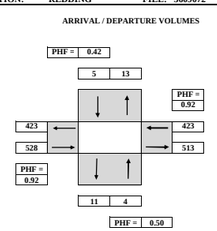
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HUNTINGTON DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		1	0		1	2			1	118	1		0	87	0		211
4:15 PM	4:30 PM		1	1		3	3			3	231	3		0	186	1		432
4:30 PM	4:45 PM		1	1		3	3			6	339	5		1	299	2		660
4:45 PM	5:00 PM		1	1		4	5			6	466	8		1	395	2		889
5:00 PM	5:15 PM		3	1		4	5			8	607	8		3	497	3		1139
5:15 PM	5:30 PM		4	2		5	6			13	741	11		3	603	4		1392
5:30 PM	5:45 PM		5	3		5	9			16	853	11		4	695	7		1608
5:45 PM	6:00 PM		5	3		5	11			17	966	13		5	772	10		1807
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	1	0	0	0	1	0	2	0	1	118	1	0	0	87	0	211
4:15 PM	4:30 PM	0	0	0	1	0	2	0	1	0	2	113	2	0	0	99	1	221
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	3	108	2	0	1	113	1	228
4:45 PM	5:00 PM	0	0	0	0	0	1	0	2	0	0	127	3	0	0	96	0	229
5:00 PM	5:15 PM	0	2	0	0	0	0	0	0	0	2	141	0	0	2	102	1	250
5:15 PM	5:30 PM	0	1	0	1	0	1	0	1	0	5	134	3	0	0	106	1	253
5:30 PM	5:45 PM	0	1	0	1	0	0	0	3	0	3	112	0	0	1	92	3	216
5:45 PM	6:00 PM	0	0	0	0	0	0	0	2	0	1	113	2	0	1	77	3	199
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	1	0	1	0	4	0	5	0	6	466	8	0	1	395	2	889
4:15 PM	5:15 PM	0	2	0	1	0	3	0	3	0	7	489	7	0	3	410	3	928
4:30 PM	5:30 PM	0	3	0	1	0	2	0	3	0	10	510	8	0	3	417	3	960
4:45 PM	5:45 PM	0	4	0	2	0	2	0	6	0	10	514	6	0	3	396	5	948
5:00 PM	6:00 PM	0	4	0	2	0	1	0	6	0	11	500	5	0	4	377	8	918

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	3	0	1	0	2	0	3	0	10	510	8	0	3	417	3	**960**
PHF BY MOVEMENT	0.00	0.38	0.00	0.25	0.00	0.50	0.00	0.38	0.00	0.50	0.90	0.67	0.00	0.38	0.92	0.75	OVERALL
PHF BY APPROACH	0.50				0.42				0.92				0.92				0.95
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		0		0		0		6		6		10		10		**16**
TRUCK PERCENTAGE	0.0%		0.0%		0.0%		0.0%		1.1%		1.2%		2.4%		2.4%		**1.7%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

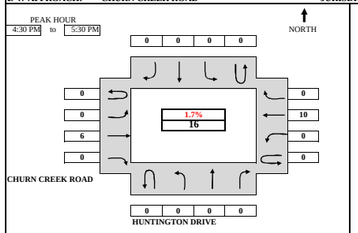
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

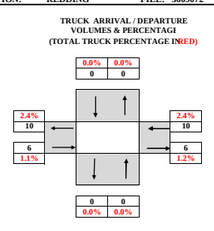
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HUNTINGTON DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE INCED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						2				1				3			6
4:15 PM	4:30 PM						2				4				5			11
4:30 PM	4:45 PM						2				6				6			14
4:45 PM	5:00 PM						2				7				7			16
5:00 PM	5:15 PM						2				9				12			23
5:15 PM	5:30 PM						2				10				15			27
5:30 PM	5:45 PM						2				10				16			28
5:45 PM	6:00 PM						2				12				20			34
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	0	0	3	0	6
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	7
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	6
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	0	0	2	0	0	7	0	0	0	7	0	16
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	9	0	17
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	10	0	16
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	10	0	14
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	13	0	18

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

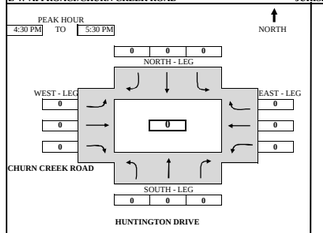
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	0	0	0	6	6	10	10	16
TRUCK PERCENTAGE	0.0%	0.0%	0.0%	0.0%	1.1%	1.2%	2.4%	2.4%	1.7%

B.A.Y.M.E.T.R.I.C.S.

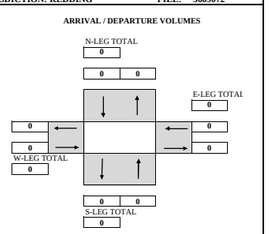
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: HUNTINGTON DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

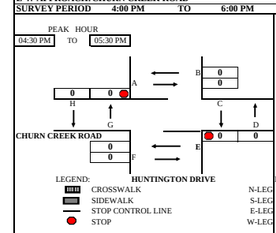
4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: HUNTINGTON DRIVE — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:30 PM TO 05:30 PM



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

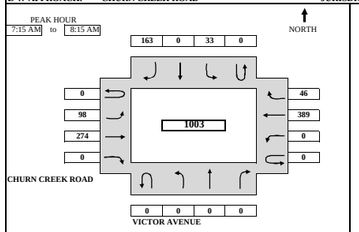
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

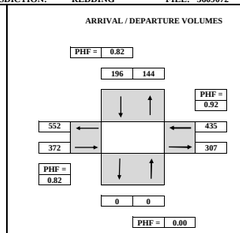
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: VICTOR AVENUE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM					9	39			14	35			81	4			**182**
7:15 AM	7:30 AM					20	88			30	87			169	14			**408**
7:30 AM	7:45 AM					27	120			57	164			278	23			**669**
7:45 AM	8:00 AM					35	169			95	240			371	38			**948**
8:00 AM	8:15 AM					42	202			112	309			470	50			**1185**
8:15 AM	8:30 AM					50	235			139	360			544	61			**1389**
8:30 AM	8:45 AM					57	254			164	418			617	68			**1578**
8:45 AM	9:00 AM					63	275			195	475			683	79			**1770**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	9	0	39	0	14	35	0	0	0	81	4	**182**
7:15 AM	7:30 AM	0	0	0	0	0	11	0	49	0	16	52	0	0	0	88	10	**226**
7:30 AM	7:45 AM	0	0	0	0	0	7	0	32	0	27	77	0	0	0	109	9	**261**
7:45 AM	8:00 AM	0	0	0	0	0	8	0	49	0	38	76	0	0	0	93	15	**279**
8:00 AM	8:15 AM	0	0	0	0	0	7	0	33	0	17	69	0	0	0	99	12	**237**
8:15 AM	8:30 AM	0	0	0	0	0	8	0	33	0	27	51	0	0	0	74	11	**204**
8:30 AM	8:45 AM	0	0	0	0	0	7	0	19	0	25	58	0	0	0	73	7	**189**
8:45 AM	9:00 AM	0	0	0	0	0	6	0	21	0	31	57	0	0	0	66	11	**192**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	35	0	169	0	95	240	0	0	0	371	38	**948**
7:15 AM	8:15 AM	0	0	0	0	0	33	0	163	0	98	274	0	0	0	389	46	**1003**
7:30 AM	8:30 AM	0	0	0	0	0	30	0	147	0	109	273	0	0	0	375	47	**981**
7:45 AM	8:45 AM	0	0	0	0	0	30	0	134	0	107	254	0	0	0	339	45	**909**
8:00 AM	9:00 AM	0	0	0	0	0	28	0	106	0	100	235	0	0	0	312	41	**822**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	33	0	163	0	98	274	0	0	0	389	46	**1003**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.83	0.00	0.64	0.89	0.00	0.00	0.00	0.89	0.77	OVERALL
PHF BY APPROACH	0.00				0.82				0.82				0.92				0.90
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		6		3		0		6		4		11		10		**20**
TRUCK PERCENTAGE	0.0%		4.2%		1.5%		0.0%		1.6%		1.3%		2.5%		1.8%		**2.0%**
BICYCLE	0				1				0				2				**3**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

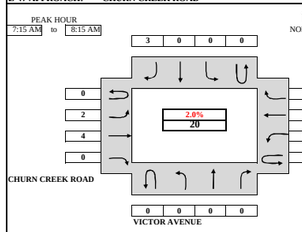
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

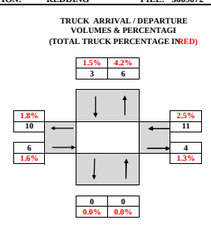
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: VICTOR AVENUE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM					0	0			0	2			4	0			**6**
7:15 AM	7:30 AM					0	1			0	2			5	3			**11**
7:30 AM	7:45 AM					0	2			0	4			6	4			**16**
7:45 AM	8:00 AM					0	3			2	5			7	4			**21**
8:00 AM	8:15 AM					0	3			2	6			11	4			**26**
8:15 AM	8:30 AM					1	3			3	8			15	4			**34**
8:30 AM	8:45 AM					2	3			3	11			20	4			**43**
8:45 AM	9:00 AM					2	3			4	14			25	4			**52**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	**6**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	3	1	**5**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	1	**5**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	1	0	2	1	0	0	0	1	0	**5**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	**5**
8:15 AM	8:30 AM	0	0	0	0	0	1	0	0	0	1	2	0	0	0	4	0	**8**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	5	0	**9**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	1	3	0	0	0	5	0	**9**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	2	5	0	0	0	7	4	**21**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	3	0	2	4	0	0	0	7	4	**20**
7:30 AM	8:30 AM	0	0	0	0	0	1	0	2	0	3	6	0	0	0	10	1	**23**
7:45 AM	8:45 AM	0	0	0	0	0	2	0	1	0	3	7	0	0	0	14	0	**27**
8:00 AM	9:00 AM	0	0	0	0	0	2	0	0	0	2	9	0	0	0	18	0	**31**

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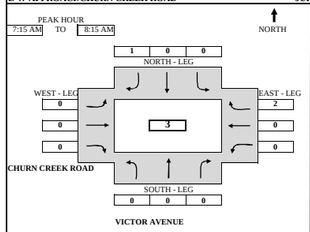
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	6	3	0	6	4	11	10	20
TRUCK PERCENTAGE	0.0%	4.2%	1.5%	0.0%	1.6%	1.3%	2.5%	1.8%	2.0%

B.A.Y.M.E.T.R.I.C.S.

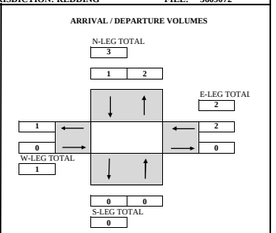
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: VICTOR AVENUE — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	**1**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	**3**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	3	**3**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	**3**
8:00 AM	8:15 AM	0	0	0	0	0	1	0	0	0	0	0	3	**4**
8:15 AM	8:30 AM	0	0	0	0	0	1	0	0	0	0	0	3	**4**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	0	0	0	0	3	**4**
8:45 AM	9:00 AM	0	0	0	0	0	1	0	0	0	0	0	3	**4**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	**1**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	**2**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	**1**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	**3**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	1	0	0	2	**3**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	**1**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	**1**
8:00 AM	9:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	**1**

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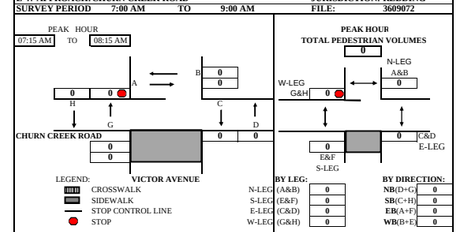
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	1	0	2	**3**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: VICTOR AVENUE — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



BY LEG:		BY DIRECTION:	
N-LEG	(A&B) 0	NB	(D+G) 0
S-LEG	(E&F) 0	SB	(C+H) 0
E-LEG	(C&D) 0	EB	(A+F) 0
W-LEG	(G&H) 0	WB	(B+E) 0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

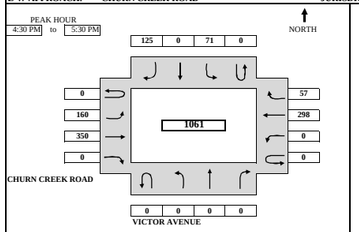
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

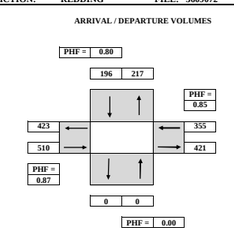
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: VICTOR AVENUE — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																		
4:00 PM	4:15 PM					11	21			38	87			63	14			**234**
4:15 PM	4:30 PM					22	50			65	172			140	28			**477**
4:30 PM	4:45 PM					38	95			101	244			212	46			**736**
4:45 PM	5:00 PM					53	111			138	332			284	56			**974**
5:00 PM	5:15 PM					71	138			182	435			372	72			**1270**
5:15 PM	5:30 PM					93	175			225	522			438	85			**1538**
5:30 PM	5:45 PM					109	214			249	611			494	100			**1777**
5:45 PM	6:00 PM					119	229			286	682			555	110			**1981**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	11	0	21	0	38	87	0	0	0	63	14	**234**
4:15 PM	4:30 PM	0	0	0	0	0	11	0	29	0	27	85	0	0	0	77	14	**243**
4:30 PM	4:45 PM	0	0	0	0	0	16	0	45	0	36	72	0	0	0	72	18	**259**
4:45 PM	5:00 PM	0	0	0	0	0	15	0	16	0	37	88	0	0	0	72	10	**238**
5:00 PM	5:15 PM	0	0	0	0	0	18	0	27	0	44	103	0	0	0	88	16	**296**
5:15 PM	5:30 PM	0	0	0	0	0	22	0	37	0	43	87	0	0	0	66	13	**268**
5:30 PM	5:45 PM	0	0	0	0	0	16	0	39	0	24	89	0	0	0	56	15	**239**
5:45 PM	6:00 PM	0	0	0	0	0	10	0	15	0	37	71	0	0	0	61	10	**204**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	53	0	111	0	138	332	0	0	0	284	56	**974**
4:15 PM	5:15 PM	0	0	0	0	0	60	0	117	0	144	348	0	0	0	309	58	**1036**
4:30 PM	5:30 PM	0	0	0	0	0	71	0	125	0	160	350	0	0	0	298	57	**1061**
4:45 PM	5:45 PM	0	0	0	0	0	71	0	119	0	148	367	0	0	0	282	54	**1041**
5:00 PM	6:00 PM	0	0	0	0	0	66	0	118	0	148	350	0	0	0	271	54	**1007**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND NBU	NBL	NBT	NBR	SOUTHBOUND SBU	SBL	SBT	SBR	EASTBOUND EBU	EBL	EBT	EBR	WESTBOUND WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	0	0	0	0	71	0	125	0	160	350	0	0	0	298	57	**1061**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.69	0.00	0.91	0.85	0.00	0.00	0.00	0.85	0.79	OVERALL
PHF BY APPROACH	0.00				0.80				0.87				0.85				0.90
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		0		2		0		5		6		11		12		**18**
TRUCK PERCENTAGE	0.0%		0.0%		1.0%		0.0%		1.0%		1.4%		3.1%		2.8%		**1.7%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

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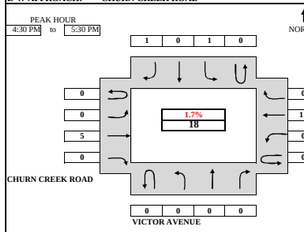
B.A.Y.M.E.T.R.I.C.S.

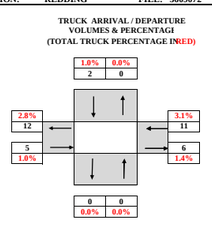
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: VICTOR AVENUE — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																		
4:00 PM	4:15 PM					1	1			0	3			5				**5**
4:15 PM	4:30 PM					1	1			5	5			12				**12**
4:30 PM	4:45 PM					1	2			5	5			13				**13**
4:45 PM	5:00 PM					2	2			6	8			18				**18**
5:00 PM	5:15 PM					2	2			9	14			27				**27**
5:15 PM	5:30 PM					2	2			10	16			30				**30**
5:30 PM	5:45 PM					2	2			10	16			30				**30**
5:45 PM	6:00 PM					2	2			10	18			32				**32**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3	0	**5**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0	**7**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	3	0	**5**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	6	0	**9**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	**3**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	**2**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	2	0	2	0	0	6	0	0	0	8	0	**18**
4:15 PM	5:15 PM	0	0	0	0	0	1	0	1	0	0	9	0	0	0	11	0	**22**
4:30 PM	5:30 PM	0	0	0	0	0	1	0	1	0	0	5	0	0	0	11	0	**18**
4:45 PM	5:45 PM	0	0	0	0	0	1	0	0	0	0	5	0	0	0	11	0	**17**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	10	0	**14**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

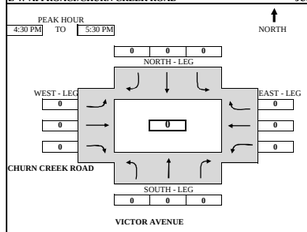
4:30 PM to 5:30 PM DIRECTION	NB IN	NB OUT	SB IN	SB OUT	EB IN	EB OUT	WB IN	WB OUT	OVERALL INTERSECTION
TRUCK VOLUMES	0	0	2	0	5	6	11	12	18
TRUCK PERCENTAGE	0.0%	0.0%	1.0%	0.0%	1.0%	1.4%	3.1%	2.8%	1.7%

B.A.Y.M.E.T.R.I.C.S.

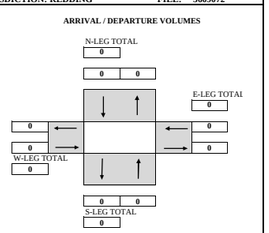
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: VICTOR AVENUE — **SURVEY TIME:** 4:00 PM TO 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	To	NB (SOUTH - LEG) LEFT	THRU	RIGHT	SB (NORTH - LEG) LEFT	THRU	RIGHT	EB (WEST - LEG) LEFT	THRU	RIGHT	WB (EAST - LEG) LEFT	THRU	RIGHT	TOTAL
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

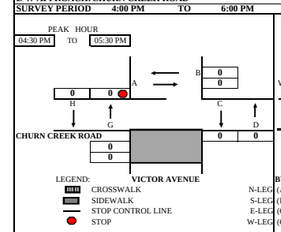
4:30 PM to 5:30 PM VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: VICTOR AVENUE — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:30 PM TO 05:30 PM



TIME PERIOD From	To	NORTH X-WALK A	B	EAST X-WALK C	D	SOUTH X-WALK E	F	WEST X-WALK G	H	TOTAL
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

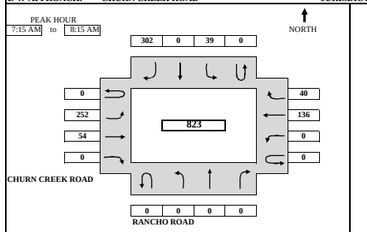
4:30 PM to 5:30 PM VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

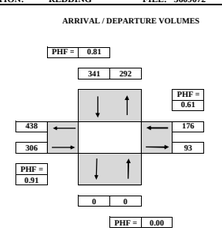
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: RANCHO ROAD — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						10	65			29	14			20	3		**141**
7:15 AM	7:30 AM						16	144			82	24			39	8		**313**
7:30 AM	7:45 AM						29	236			149	40			69	16		**539**
7:45 AM	8:00 AM						42	308			216	57			102	25		**750**
8:00 AM	8:15 AM						49	367			281	68			156	43		**964**
8:15 AM	8:30 AM						57	427			326	82			180	51		**1123**
8:30 AM	8:45 AM						60	489			370	103			198	55		**1275**
8:45 AM	9:00 AM						67	538			417	121			227	63		**1433**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	10	0	65	0	29	14	0	0	0	20	3	**141**
7:15 AM	7:30 AM	0	0	0	0	0	6	0	79	0	53	10	0	0	0	19	5	**172**
7:30 AM	7:45 AM	0	0	0	0	0	13	0	92	0	67	16	0	0	0	30	8	**226**
7:45 AM	8:00 AM	0	0	0	0	0	13	0	72	0	67	17	0	0	0	33	9	**211**
8:00 AM	8:15 AM	0	0	0	0	0	7	0	59	0	65	11	0	0	0	54	18	**214**
8:15 AM	8:30 AM	0	0	0	0	0	8	0	60	0	45	14	0	0	0	24	8	**159**
8:30 AM	8:45 AM	0	0	0	0	0	3	0	62	0	44	21	0	0	0	18	4	**152**
8:45 AM	9:00 AM	0	0	0	0	0	7	0	49	0	47	18	0	0	0	29	8	**158**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	42	0	308	0	216	57	0	0	0	102	25	**750**
7:15 AM	8:15 AM	0	0	0	0	0	39	0	302	0	252	54	0	0	0	136	40	**823**
7:30 AM	8:30 AM	0	0	0	0	0	41	0	283	0	244	58	0	0	0	141	43	**810**
7:45 AM	8:45 AM	0	0	0	0	0	31	0	253	0	221	63	0	0	0	129	39	**736**
8:00 AM	9:00 AM	0	0	0	0	0	25	0	230	0	201	64	0	0	0	125	38	**683**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	39	0	302	0	252	54	0	0	0	136	40	**823**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.82	0.00	0.94	0.79	0.00	0.00	0.00	0.63	0.56	OVERALL
PHF BY APPROACH	0.00				0.81				0.91				0.61				0.91
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		5		6		0		4		1		7		11		**17**
TRUCK PERCENTAGE	0.0%		1.7%		1.8%		0.0%		1.3%		1.1%		4.0%		2.5%		**2.1%**
BICYCLE	0				1				1				1				**3**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

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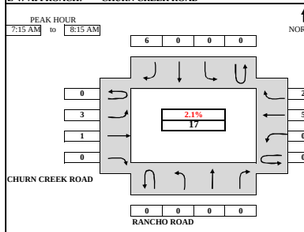
B.A.Y.M.E.T.R.I.C.S.

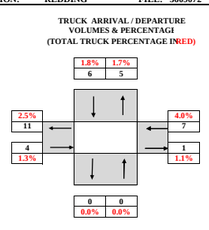
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: RANCHO ROAD — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						4				1	1			0	1		**7**
7:15 AM	7:30 AM						7				1	1			1	1		**11**
7:30 AM	7:45 AM						7				3	1			3	1		**15**
7:45 AM	8:00 AM						7				4	1			4	2		**18**
8:00 AM	8:15 AM						10				4	2			5	3		**24**
8:15 AM	8:30 AM						13				5	4			6	3		**31**
8:30 AM	8:45 AM						18				7	6			6	3		**40**
8:45 AM	9:00 AM						22				8	8			7	3		**48**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	4	0	1	1	0	0	0	1	0	**7**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	3	0	0	1	0	0	0	1	0	**4**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	**4**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	**3**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	3	0	0	1	0	0	0	1	1	**6**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	3	0	1	2	0	0	0	1	0	**7**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	5	0	2	2	0	0	0	0	0	**9**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	4	0	1	2	0	0	0	1	0	**8**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	0	0	7	0	4	1	0	0	0	4	2	**18**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	6	0	3	1	0	0	0	5	2	**17**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	6	0	4	3	0	0	0	5	2	**20**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	11	0	4	5	0	0	0	3	2	**25**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	15	0	4	7	0	0	0	3	1	**30**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

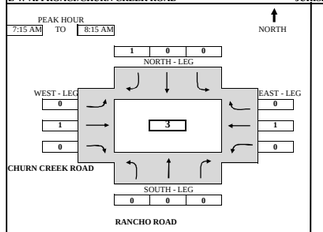
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	5	6	0	4	1	7	11	17
TRUCK PERCENTAGE	0.0%	1.7%	1.8%	0.0%	1.3%	1.1%	4.0%	2.5%	2.1%

B.A.Y.M.E.T.R.I.C.S.

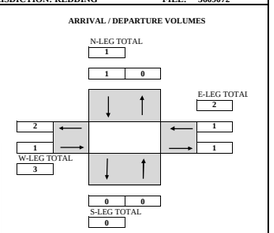
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: RANCHO ROAD — **SURVEY TIME:** 7:00 AM TO 9:00 AM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
7:15 AM	7:30 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
7:30 AM	7:45 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
7:45 AM	8:00 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
8:00 AM	8:15 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
8:15 AM	8:30 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
8:45 AM	9:00 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	**1**
7:15 AM	7:30 AM	0	0	0	0	0	1	0	1	0	0	1	0	**3**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	1	0	1	0	0	2	0	**4**
7:15 AM	8:15 AM	0	0	0	0	0	1	0	1	0	0	1	0	**3**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

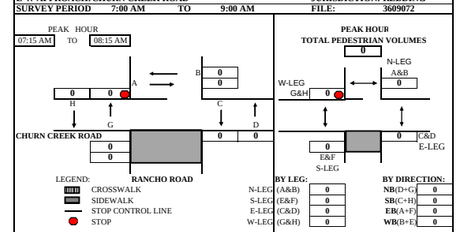
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	1	1	1	**3**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: RANCHO ROAD — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

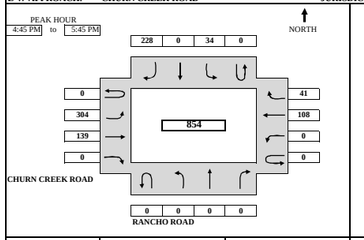
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

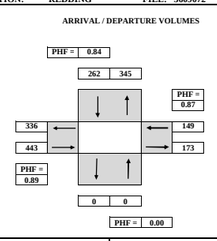
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: RANCHO ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:45 PM to 5:45 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						12	50			66	34			24	7		**193**
4:15 PM	4:30 PM						20	119			123	72			48	12		**394**
4:30 PM	4:45 PM						25	179			190	93			77	21		**585**
4:45 PM	5:00 PM						30	236			258	128			102	28		**782**
5:00 PM	5:15 PM						34	310			341	169			133	40		**1027**
5:15 PM	5:30 PM						46	364			418	201			158	48		**1235**
5:30 PM	5:45 PM						59	407			494	232			185	62		**1439**
5:45 PM	6:00 PM						62	460			551	253			203	65		**1594**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	12	0	50	0	66	34	0	0	0	24	7	**193**
4:15 PM	4:30 PM	0	0	0	0	0	8	0	69	0	57	38	0	0	0	24	5	**201**
4:30 PM	4:45 PM	0	0	0	0	0	5	0	60	0	67	21	0	0	0	29	9	**191**
4:45 PM	5:00 PM	0	0	0	0	0	5	0	57	0	68	35	0	0	0	25	7	**197**
5:00 PM	5:15 PM	0	0	0	0	0	4	0	74	0	83	41	0	0	0	31	12	**245**
5:15 PM	5:30 PM	0	0	0	0	0	12	0	54	0	77	32	0	0	0	25	8	**208**
5:30 PM	5:45 PM	0	0	0	0	0	13	0	43	0	76	31	0	0	0	27	14	**204**
5:45 PM	6:00 PM	0	0	0	0	0	3	0	53	0	57	21	0	0	0	18	3	**155**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	30	0	236	0	258	128	0	0	0	102	28	**782**
4:15 PM	5:15 PM	0	0	0	0	0	22	0	260	0	275	135	0	0	0	109	33	**834**
4:30 PM	5:30 PM	0	0	0	0	0	26	0	245	0	295	129	0	0	0	110	36	**841**
4:45 PM	5:45 PM	0	0	0	0	0	34	0	228	0	304	139	0	0	0	108	41	**854**
5:00 PM	6:00 PM	0	0	0	0	0	32	0	224	0	293	125	0	0	0	101	37	**812**

PEAK HOUR SUMMARY

4:45 PM to 5:45 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	34	0	228	0	304	139	0	0	0	108	41	**854**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.77	0.00	0.92	0.85	0.00	0.00	0.00	0.87	0.73	OVERALL
PHF BY APPROACH	0.00				0.84				0.89				0.87				0.87
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		6		7		0		6		1		5		11		**18**
TRUCK PERCENTAGE	0.0%		1.7%		2.7%		0.0%		1.4%		0.6%		3.4%		3.3%		**2.1%**
BICYCLE	0				0				1				0				**1**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

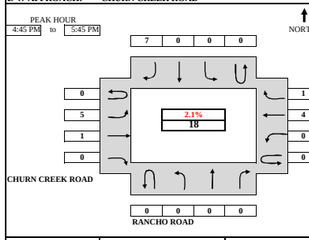
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

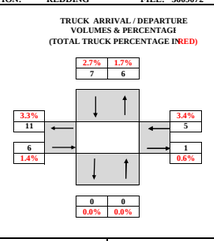
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: RANCHO ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:45 PM to 5:45 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE INCED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						2				0	1			1	0		**4**
4:15 PM	4:30 PM						4				4	2			1	0		**11**
4:30 PM	4:45 PM						4				4	2			1	0		**11**
4:45 PM	5:00 PM						7				5	3			1	1		**17**
5:00 PM	5:15 PM						11				8	3			3	1		**26**
5:15 PM	5:30 PM						11				9	3			5	1		**29**
5:30 PM	5:45 PM						11				9	3			5	1		**29**
5:45 PM	6:00 PM						13				9	3			5	1		**31**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	0	0	1	0	**4**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	2	0	4	1	0	0	0	0	0	**7**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	3	0	1	1	0	0	0	0	1	**6**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	4	0	3	0	0	0	0	2	0	**9**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	**3**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	**2**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	0	0	7	0	5	3	0	0	0	1	1	**17**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	9	0	8	2	0	0	0	2	1	**22**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	7	0	5	1	0	0	0	4	1	**18**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	7	0	5	1	0	0	0	4	1	**18**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	6	0	4	0	0	0	0	4	0	**14**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

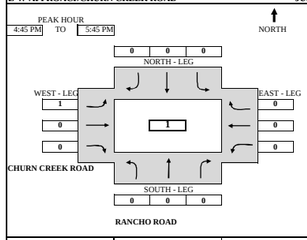
4:45 PM to 5:45 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	6	7	0	6	1	5	11	18
TRUCK PERCENTAGE	0.0%	1.7%	2.7%	0.0%	1.4%	0.6%	3.4%	3.3%	2.1%

B.A.Y.M.E.T.R.I.C.S.

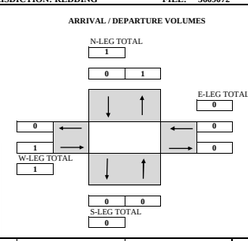
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016 — **DAY:** TUESDAY
N-S APPROACH: RANCHO ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:45 PM TO 5:45 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:15 PM	4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:15 PM	5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:30 PM	5:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	**2**
5:45 PM	6:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	**2**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:00 PM	6:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

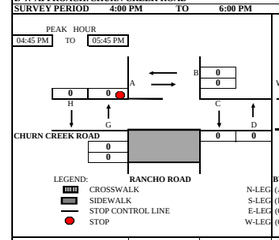
4:45 PM to 5:45 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

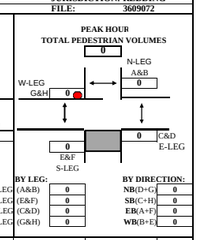
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/13/2016
N-S APPROACH: RANCHO ROAD — **DAY:** TUESDAY
E-W APPROACH: CHURN CREEK ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:45 PM TO 05:45 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:		BY DIRECTION:	
N-LEG	(A&B) 0	NB	(D+G) 0
S-LEG	(E&F) 0	SB	(C+H) 0
E-LEG	(C&D) 0	EB	(A+F) 0
W-LEG	(G&H) 0	WB	(B+E) 0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

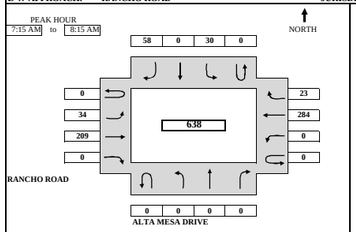
4:45 PM to 5:45 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

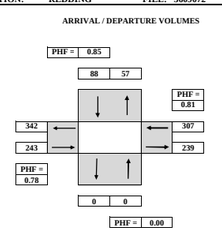
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: ALTA MESA DRIVE — **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						4	9			2	29			54	1		**99**
7:15 AM	7:30 AM						10	20			9	68			117	5		**229**
7:30 AM	7:45 AM						19	37			21	124			204	13		**418**
7:45 AM	8:00 AM						26	50			32	191			279	18		**596**
8:00 AM	8:15 AM						34	67			36	238			338	24		**737**
8:15 AM	8:30 AM						35	79			41	280			381	27		**843**
8:30 AM	8:45 AM						35	84			43	316			432	27		**937**
8:45 AM	9:00 AM						37	94			46	357			479	29		**1042**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	4	9	0	0	2	29	0	0	0	54	1	**99**
7:15 AM	7:30 AM	0	0	0	0	0	6	11	0	0	7	39	0	0	0	63	4	**130**
7:30 AM	7:45 AM	0	0	0	0	0	9	17	0	0	12	56	0	0	0	87	8	**189**
7:45 AM	8:00 AM	0	0	0	0	0	7	13	0	0	11	67	0	0	0	75	5	**178**
8:00 AM	8:15 AM	0	0	0	0	0	8	17	0	0	4	47	0	0	0	59	6	**141**
8:15 AM	8:30 AM	0	0	0	0	0	1	0	12	0	5	42	0	0	0	43	3	**106**
8:30 AM	8:45 AM	0	0	0	0	0	0	5	0	0	2	36	0	0	0	51	0	**94**
8:45 AM	9:00 AM	0	0	0	0	0	2	0	10	0	3	41	0	0	0	47	2	**105**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	26	0	50	0	32	191	0	0	0	279	18	**596**
7:15 AM	8:15 AM	0	0	0	0	0	30	0	58	0	34	209	0	0	0	284	23	**638**
7:30 AM	8:30 AM	0	0	0	0	0	25	0	59	0	32	212	0	0	0	264	22	**614**
7:45 AM	8:45 AM	0	0	0	0	0	16	0	47	0	22	192	0	0	0	228	14	**519**
8:00 AM	9:00 AM	0	0	0	0	0	11	0	44	0	14	166	0	0	0	200	11	**446**

PEAK HOUR SUMMARY — 7:15 AM to 8:15 AM

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	30	0	58	0	34	209	0	0	0	284	23	**638**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.85	0.00	0.71	0.78	0.00	0.00	0.00	0.82	0.72	OVERALL
PHF BY APPROACH	0.00				0.85				0.78				0.81				0.84
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		1		2		0		3		3		8		9		**13**
TRUCK PERCENTAGE	0.0%		1.8%		2.3%		0.0%		1.2%		1.3%		2.6%		2.6%		**2.0%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

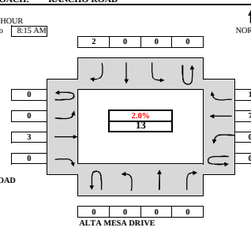
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

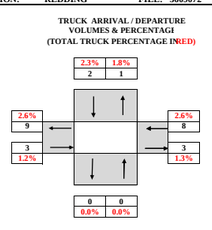
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: ALTA MESA DRIVE — **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						1	0			0	1			2	1		**5**
7:15 AM	7:30 AM						1	1			0	2			4	1		**9**
7:30 AM	7:45 AM						1	1			0	2			4	1		**9**
7:45 AM	8:00 AM						1	2			0	4			7	1		**15**
8:00 AM	8:15 AM						1	2			0	4			9	2		**18**
8:15 AM	8:30 AM						1	2			0	7			9	2		**21**
8:30 AM	8:45 AM						1	2			0	11			13	2		**29**
8:45 AM	9:00 AM						1	2			0	14			15	3		**35**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	2	1	0	**5**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0	0	**4**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	3	0	0	**6**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	**3**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	**3**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	**8**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	2	1	0	**6**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	1	0	2	0	0	4	0	0	0	7	1	**15**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	2	0	0	3	0	0	0	7	1	**13**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	1	0	0	5	0	0	0	5	1	**12**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	1	0	0	9	0	0	0	9	1	**20**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	8	2	**20**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

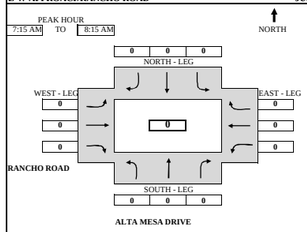
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	1	2	0	3	3	8	9	13
TRUCK PERCENTAGE	0.0%	1.8%	2.3%	0.0%	1.2%	1.3%	2.6%	2.6%	2.0%

B.A.Y.M.E.T.R.I.C.S.

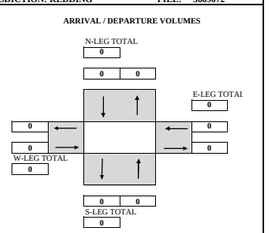
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: ALTA MESA DRIVE — **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

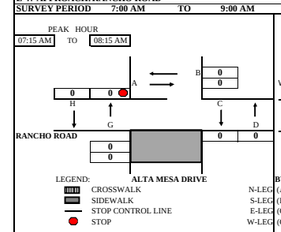
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: ALTA MESA DRIVE — **DAY:** WEDNESDAY
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

7:15 AM to 8:15 AM

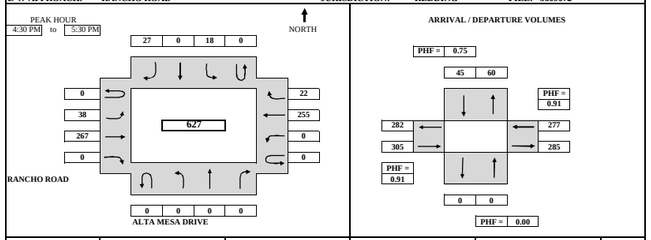
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: ALTA MESA DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						1	5			6	56			54	3		125
4:15 PM	4:30 PM						3	12			14	110			115	8		262
4:30 PM	4:45 PM						6	19			25	175			184	15		424
4:45 PM	5:00 PM						13	27			32	234			252	21		579
5:00 PM	5:15 PM						19	32			41	309			309	28		738
5:15 PM	5:30 PM						21	39			52	377			370	30		889
5:30 PM	5:45 PM						22	44			62	450			408	32		1018
5:45 PM	6:00 PM						29	50			69	519			455	35		1157
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	1	0	5	0	6	56	0	0	0	54	3	125
4:15 PM	4:30 PM	0	0	0	0	0	2	0	7	0	8	54	0	0	0	61	5	137
4:30 PM	4:45 PM	0	0	0	0	0	3	0	7	0	11	65	0	0	0	69	7	162
4:45 PM	5:00 PM	0	0	0	0	0	7	0	8	0	7	59	0	0	0	68	6	155
5:00 PM	5:15 PM	0	0	0	0	0	6	0	5	0	9	75	0	0	0	57	7	159
5:15 PM	5:30 PM	0	0	0	0	0	2	0	7	0	11	68	0	0	0	61	2	151
5:30 PM	5:45 PM	0	0	0	0	0	1	0	5	0	10	73	0	0	0	38	2	129
5:45 PM	6:00 PM	0	0	0	0	0	7	0	6	0	7	69	0	0	0	47	3	139
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	13	0	27	0	32	234	0	0	0	252	21	579
4:15 PM	5:15 PM	0	0	0	0	0	18	0	27	0	35	253	0	0	0	255	25	613
4:30 PM	5:30 PM	0	0	0	0	0	18	0	27	0	38	267	0	0	0	255	22	627
4:45 PM	5:45 PM	0	0	0	0	0	16	0	25	0	37	275	0	0	0	224	17	594
5:00 PM	6:00 PM	0	0	0	0	0	16	0	23	0	37	285	0	0	0	203	14	578

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	18	0	27	0	38	267	0	0	0	255	22	**627**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.84	0.00	0.86	0.89	0.00	0.00	0.00	0.92	0.79	OVERALL
PHF BY APPROACH	0.00				0.75				0.91				0.91				0.97
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		2		1		0		5		4		8		8		**14**
TRUCK PERCENTAGE	0.0%		3.3%		2.2%		0.0%		1.6%		1.4%		2.9%		2.8%		**2.2%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

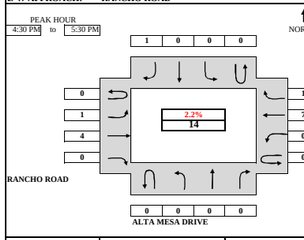
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

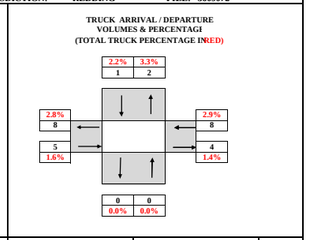
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: ALTA MESA DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM						0	0			1	0			3	0		4
4:15 PM	4:30 PM						1	0			1	1			7	0		10
4:30 PM	4:45 PM						1	1			2	2			7	0		13
4:45 PM	5:00 PM						1	1			2	2			11	0		17
5:00 PM	5:15 PM						1	1			2	3			12	1		20
5:15 PM	5:30 PM						1	2			2	5			14	1		24
5:30 PM	5:45 PM						1	2			2	5			17	1		28
5:45 PM	6:00 PM						1	2			2	7			18	1		31
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0		4
4:15 PM	4:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	4	0		6
4:30 PM	4:45 PM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0		3
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0		4
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1		3
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0		4
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0		4
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0		3
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	1	0	1	0	2	2	0	0	11	0		17
4:15 PM	5:15 PM	0	0	0	0	0	1	0	1	0	1	3	0	0	9	1		16
4:30 PM	5:30 PM	0	0	0	0	0	0	0	1	0	1	4	0	0	7	1		14
4:45 PM	5:45 PM	0	0	0	0	0	0	0	1	0	0	3	0	0	10	1		15
5:00 PM	6:00 PM	0	0	0	0	0	0	0	1	0	0	5	0	0	7	1		14

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

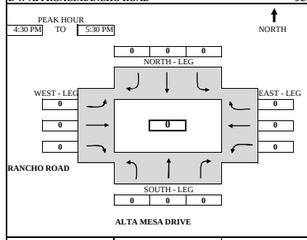
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	2	1	0	5	4	8	8	14
TRUCK PERCENTAGE	0.0%	3.3%	2.2%	0.0%	1.6%	1.4%	2.9%	2.8%	2.2%

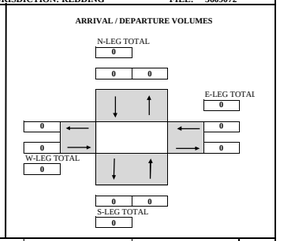
B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: ALTA MESA DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

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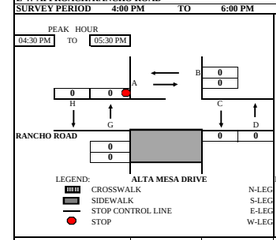
4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: ALTA MESA DRIVE — **DAY:** WEDNESDAY
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:30 PM TO 05:30 PM



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

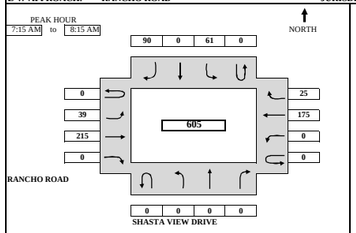
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

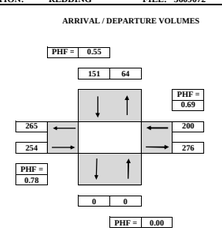
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: SHASTA VIEW DRIVE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						7	11			5	29				23	3	**78**
7:15 AM	7:30 AM						16	34			11	88				71	8	**228**
7:30 AM	7:45 AM						43	76			30	150				136	15	**450**
7:45 AM	8:00 AM						57	85			39	201				165	21	**568**
8:00 AM	8:15 AM						68	101			44	244				198	28	**683**
8:15 AM	8:30 AM						77	116			51	271				223	29	**767**
8:30 AM	8:45 AM						90	122			55	302				251	33	**853**
8:45 AM	9:00 AM						102	143			61	340				272	36	**954**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	7	0	11	0	5	29	0	0	0	23	3	**78**
7:15 AM	7:30 AM	0	0	0	0	0	9	0	23	0	6	59	0	0	0	48	5	**150**
7:30 AM	7:45 AM	0	0	0	0	0	27	0	42	0	19	62	0	0	0	65	7	**222**
7:45 AM	8:00 AM	0	0	0	0	0	14	0	9	0	9	51	0	0	0	29	6	**118**
8:00 AM	8:15 AM	0	0	0	0	0	11	0	16	0	5	43	0	0	0	33	7	**115**
8:15 AM	8:30 AM	0	0	0	0	0	9	0	15	0	7	27	0	0	0	25	1	**84**
8:30 AM	8:45 AM	0	0	0	0	0	13	0	6	0	4	31	0	0	0	28	4	**86**
8:45 AM	9:00 AM	0	0	0	0	0	12	0	21	0	6	38	0	0	0	21	3	**101**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	57	0	85	0	39	201	0	0	0	165	21	**568**
7:15 AM	8:15 AM	0	0	0	0	0	61	0	90	0	39	215	0	0	0	175	25	**605**
7:30 AM	8:30 AM	0	0	0	0	0	61	0	82	0	40	183	0	0	0	152	21	**539**
7:45 AM	8:45 AM	0	0	0	0	0	47	0	46	0	25	152	0	0	0	115	18	**403**
8:00 AM	9:00 AM	0	0	0	0	0	45	0	58	0	22	139	0	0	0	107	15	**386**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	61	0	90	0	39	215	0	0	0	175	25	**605**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.54	0.00	0.51	0.87	0.00	0.00	0.00	0.67	0.89	OVERALL
PHF BY APPROACH	0.00				0.55				0.78				0.69				0.68
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		6		4		0		7		6		10		9		**21**
TRUCK PERCENTAGE	0.0%		9.4%		2.6%		0.0%		2.8%		2.2%		5.0%		3.4%		**3.5%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

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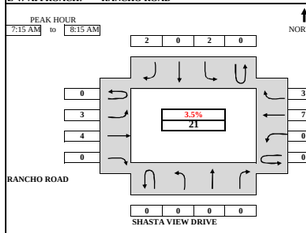
B.A.Y.M.E.T.R.I.C.S.

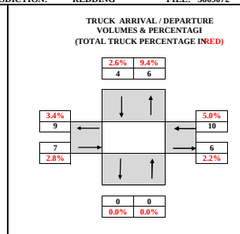
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: SHASTA VIEW DRIVE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE INCED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM						0	0			1	1				3	1	**6**
7:15 AM	7:30 AM						0	0			2	2				5	2	**11**
7:30 AM	7:45 AM						0	1			4	4				6	3	**18**
7:45 AM	8:00 AM						1	1			4	5				8	3	**22**
8:00 AM	8:15 AM						2	2			4	5				10	4	**27**
8:15 AM	8:30 AM						2	3			5	7				12	4	**33**
8:30 AM	8:45 AM						3	3			5	10				14	4	**39**
8:45 AM	9:00 AM						2	4			6	12				14	5	**44**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	3	1	**6**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	1	**5**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	1	0	2	2	0	0	0	1	1	**7**
7:45 AM	8:00 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2	0	**4**
8:00 AM	8:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	1	**5**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	0	**6**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	2	0	**6**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	1	**5**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	0	0	0	1	0	1	0	4	5	0	0	0	8	3	**22**
7:15 AM	8:15 AM	0	0	0	0	0	2	0	2	0	3	4	0	0	0	7	3	**21**
7:30 AM	8:30 AM	0	0	0	0	0	2	0	3	0	3	5	0	0	0	7	2	**22**
7:45 AM	8:45 AM	0	0	0	0	0	3	0	2	0	1	6	0	0	0	8	1	**21**
8:00 AM	9:00 AM	0	0	0	0	0	2	0	3	0	2	7	0	0	0	6	2	**22**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

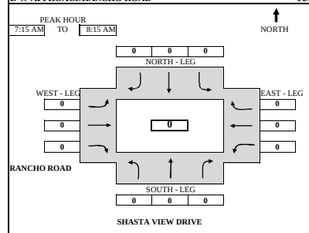
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	6	4	0	7	6	10	9	21
TRUCK PERCENTAGE	0.0%	9.4%	2.6%	0.0%	2.8%	2.2%	5.0%	3.4%	3.5%

B.A.Y.M.E.T.R.I.C.S.

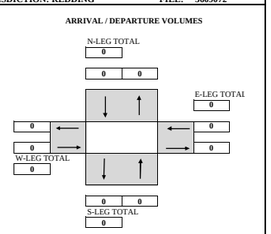
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: SHASTA VIEW DRIVE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

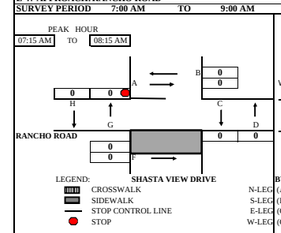
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: SHASTA VIEW DRIVE — **DAY:** WEDNESDAY
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

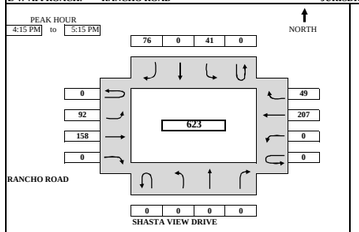
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

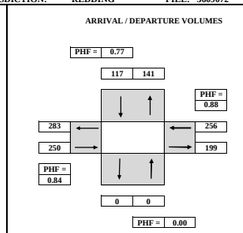
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: SHASTA VIEW DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM to 5:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM					0	11	17	0	0	13	45	0	0	46	11	0	**143**
4:15 PM	4:30 PM					0	28	38	0	0	24	88	0	0	97	24	0	**299**
4:30 PM	4:45 PM					0	36	55	0	0	45	127	0	0	144	39	0	**446**
4:45 PM	5:00 PM					0	45	73	0	0	72	162	0	0	205	51	0	**608**
5:00 PM	5:15 PM					0	52	93	0	0	105	203	0	0	253	60	0	**766**
5:15 PM	5:30 PM					0	63	102	0	0	137	242	0	0	306	69	0	**919**
5:30 PM	5:45 PM					0	76	109	0	0	162	286	0	0	343	80	0	**1056**
5:45 PM	6:00 PM					0	88	122	0	0	184	342	0	0	364	90	0	**1190**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	11	0	17	0	13	45	0	0	0	46	11	**143**
4:15 PM	4:30 PM	0	0	0	0	0	17	0	21	0	11	43	0	0	0	51	13	**156**
4:30 PM	4:45 PM	0	0	0	0	0	8	0	17	0	21	39	0	0	0	47	15	**147**
4:45 PM	5:00 PM	0	0	0	0	0	9	0	18	0	27	35	0	0	0	61	12	**162**
5:00 PM	5:15 PM	0	0	0	0	0	7	0	20	0	33	41	0	0	0	48	9	**158**
5:15 PM	5:30 PM	0	0	0	0	0	11	0	9	0	32	39	0	0	0	53	9	**153**
5:30 PM	5:45 PM	0	0	0	0	0	13	0	7	0	25	44	0	0	0	37	11	**137**
5:45 PM	6:00 PM	0	0	0	0	0	12	0	13	0	22	56	0	0	0	21	10	**134**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	45	0	73	0	72	162	0	0	0	205	51	**608**
4:15 PM	5:15 PM	0	0	0	0	0	41	0	76	0	92	158	0	0	0	207	49	**623**
4:30 PM	5:30 PM	0	0	0	0	0	35	0	64	0	113	154	0	0	0	209	45	**620**
4:45 PM	5:45 PM	0	0	0	0	0	40	0	54	0	117	159	0	0	0	199	41	**610**
5:00 PM	6:00 PM	0	0	0	0	0	33	0	49	0	112	180	0	0	0	159	39	**582**

PEAK HOUR SUMMARY

4:15 PM to 5:15 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	41	0	76	0	92	158	0	0	0	207	49	**623**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.90	0.00	0.70	0.92	0.00	0.00	0.00	0.85	0.82	OVERALL
PHF BY APPROACH	0.00				0.77				0.84				0.88				0.96
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	0		2		2		0		4		2		3		5		**9**
TRUCK PERCENTAGE	0.0%		1.4%		1.7%		0.0%		1.6%		1.0%		1.2%		1.8%		**1.4%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

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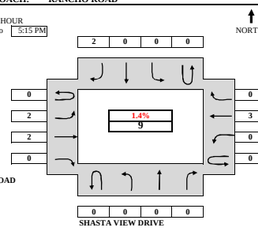
B.A.Y.M.E.T.R.I.C.S.

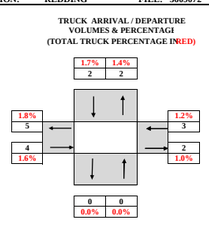
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: SHASTA VIEW DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM to 5:15 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE INCED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM					0	1			0	0			2	1			**4**
4:15 PM	4:30 PM					0	3			0	1			2	1			**7**
4:30 PM	4:45 PM					0	3			1	2			2	1			**9**
4:45 PM	5:00 PM					0	3			1	2			3	1			**10**
5:00 PM	5:15 PM					0	3			2	2			5	1			**13**
5:15 PM	5:30 PM					0	4			2	2			7	1			**16**
5:30 PM	5:45 PM					1	4			3	3			7	1			**19**
5:45 PM	6:00 PM					1	4			3	3			8	1			**20**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1		**4**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0		**3**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0		**2**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		**1**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0		**3**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0		**3**
5:30 PM	5:45 PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1		**3**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0		**1**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	0	0	0	0	3	0	1	2	0	0	0	3	1	**10**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	2	0	2	2	0	0	0	3	1	**9**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	1	0	2	1	0	0	0	5	0	**9**
4:45 PM	5:45 PM	0	0	0	0	0	1	0	1	0	2	1	0	0	0	5	0	**10**
5:00 PM	6:00 PM	0	0	0	0	0	1	0	1	0	2	1	0	0	0	5	0	**10**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

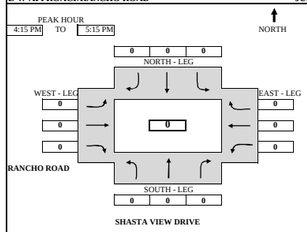
4:15 PM to 5:15 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	0	2	2	0	4	2	3	5	9
TRUCK PERCENTAGE	0.0%	1.4%	1.7%	0.0%	1.6%	1.0%	1.2%	1.8%	1.4%

B.A.Y.M.E.T.R.I.C.S.

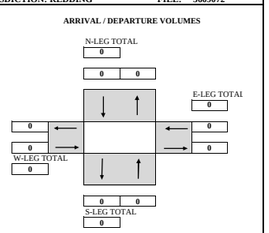
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: SHASTA VIEW DRIVE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM TO 5:15 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

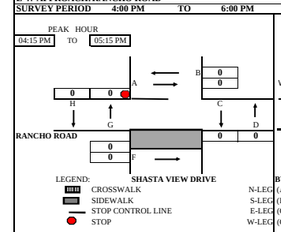
4:15 PM to 5:15 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

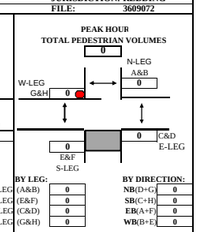
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: SHASTA VIEW DRIVE — **DAY:** WEDNESDAY
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:15 PM TO 05:15 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:		BY DIRECTION:	
N-LEG	(A&B) 0	NB	(D+G) 0
S-LEG	(E&F) 0	SB	(C+H) 0
E-LEG	(C&D) 0	EB	(A+F) 0
W-LEG	(G&H) 0	WB	(B+E) 0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 05:30 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

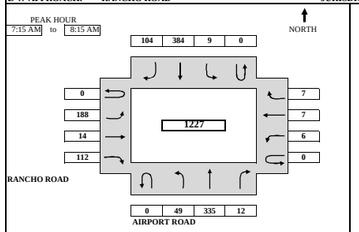
4:15 PM to 5:15 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

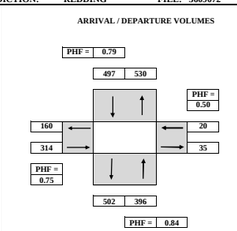
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: AIRPORT ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		10	63	0		1	66	20		25	1	28		2	1	1	**218**
7:15 AM	7:30 AM		21	137	4		1	132	51		59	3	55		3	1	1	**468**
7:30 AM	7:45 AM		33	242	5		4	225	76		130	7	85		5	1	5	**818**
7:45 AM	8:00 AM		48	334	10		6	356	100		182	12	121		6	3	5	**1183**
8:00 AM	8:15 AM		59	398	12		10	450	124		213	15	140		8	8	8	**1445**
8:15 AM	8:30 AM		66	466	13		13	530	147		236	15	157		9	9	9	**1670**
8:30 AM	8:45 AM		76	537	15		15	605	169		263	16	172		10	9	12	**1899**
8:45 AM	9:00 AM		87	592	16		17	663	193		292	16	193		10	11	14	**2104**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	10	63	0	0	1	66	20	0	25	1	28	0	2	1	1	**218**
7:15 AM	7:30 AM	0	11	74	4	0	0	66	31	0	34	2	27	0	1	0	0	**250**
7:30 AM	7:45 AM	0	12	105	1	0	3	93	25	0	71	4	30	0	2	0	4	**350**
7:45 AM	8:00 AM	0	15	92	5	0	2	131	24	0	52	5	36	0	1	2	0	**365**
8:00 AM	8:15 AM	0	11	64	2	0	4	94	24	0	31	3	19	0	2	5	3	**262**
8:15 AM	8:30 AM	0	7	68	1	0	3	80	23	0	23	0	17	0	1	1	1	**225**
8:30 AM	8:45 AM	0	10	71	2	0	2	75	22	0	27	1	15	0	1	0	3	**229**
8:45 AM	9:00 AM	0	11	55	1	0	2	58	24	0	29	0	21	0	0	2	2	**205**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	48	334	10	0	6	356	100	0	182	12	121	0	6	3	5	**1183**
7:15 AM	8:15 AM	0	49	335	12	0	9	384	104	0	188	14	112	0	6	7	7	**1227**
7:30 AM	8:30 AM	0	45	329	9	0	12	398	96	0	177	12	102	0	6	8	8	**1202**
7:45 AM	8:45 AM	0	43	295	10	0	11	380	93	0	133	9	87	0	5	8	7	**1081**
8:00 AM	9:00 AM	0	39	258	6	0	11	307	93	0	110	4	72	0	4	8	9	**921**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	49	335	12	0	9	384	104	0	188	14	112	0	6	7	7	**1227**
PHF BY MOVEMENT	0.00	0.82	0.80	0.60	0.00	0.56	0.73	0.84	0.00	0.66	0.70	0.78	0.00	0.75	0.35	0.44	OVERALL
PHF BY APPROACH		0.84				0.79				0.75				0.50			0.84
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	28		24		22		20		7		3		3		13		**60**
TRUCK PERCENTAGE	7.1%		4.5%		4.4%		4.0%		2.2%		8.6%		15.0%		8.1%		**4.9%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				0				**0**

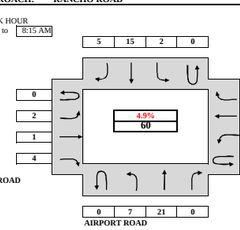
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

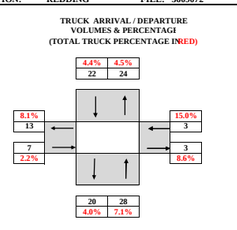
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: AIRPORT ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		1	5	0		0	5	1		0	0	2		0	1	0	**15**
7:15 AM	7:30 AM		1	12	0		0	9	3		0	0	3		1	1	0	**30**
7:30 AM	7:45 AM		3	18	0		1	11	3		1	1	3		1	1	1	**44**
7:45 AM	8:00 AM		7	23	0		1	15	3		2	1	5		1	1	1	**60**
8:00 AM	8:15 AM		8	26	0		2	20	6		2	1	6		1	2	1	**75**
8:15 AM	8:30 AM		8	27	0		2	23	6		5	1	6		1	3	2	**84**
8:30 AM	8:45 AM		10	31	0		2	24	7		6	1	7		1	3	3	**95**
8:45 AM	9:00 AM		10	35	0		2	27	7		8	1	8		1	3	3	**105**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	1	5	0	0	0	5	1	0	0	0	2	0	0	1	0	**15**
7:15 AM	7:30 AM	0	0	7	0	0	0	4	2	0	0	0	1	0	1	0	0	**15**
7:30 AM	7:45 AM	0	2	6	0	0	1	2	0	0	1	1	0	0	0	0	1	**14**
7:45 AM	8:00 AM	0	4	5	0	0	0	4	0	0	1	0	2	0	0	0	0	**16**
8:00 AM	8:15 AM	0	1	3	0	0	1	5	3	0	0	0	1	0	0	1	0	**15**
8:15 AM	8:30 AM	0	0	1	0	0	0	3	0	0	3	0	0	0	0	1	1	**9**
8:30 AM	8:45 AM	0	2	4	0	0	0	1	1	0	1	0	1	0	0	0	1	**11**
8:45 AM	9:00 AM	0	0	4	0	0	0	3	0	0	2	0	1	0	0	0	0	**10**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	7	23	0	0	1	15	3	0	2	1	5	0	1	1	1	**60**
7:15 AM	8:15 AM	0	7	21	0	0	2	15	5	0	2	1	4	0	1	1	1	**60**
7:30 AM	8:30 AM	0	7	15	0	0	2	14	3	0	5	1	3	0	0	2	2	**54**
7:45 AM	8:45 AM	0	7	13	0	0	1	13	4	0	5	0	4	0	0	2	2	**51**
8:00 AM	9:00 AM	0	3	12	0	0	1	12	4	0	6	0	3	0	0	2	2	**45**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

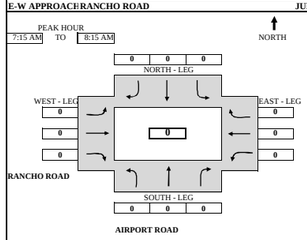
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	28	24	22	20	7	3	3	13	60
TRUCK PERCENTAGE	7.1%	4.5%	4.4%	4.0%	2.2%	8.6%	15.0%	8.1%	4.9%

B.A.Y.M.E.T.R.I.C.S.

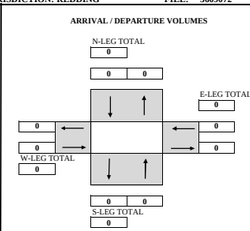
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: AIRPORT ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM

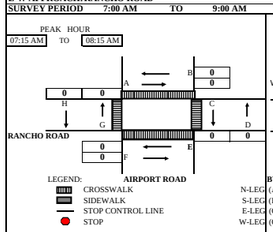
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: AIRPORT ROAD — **DAY:** WEDNESDAY
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



BY LEG: BY DIRECTION:

N-LEG (A&B)	0	**NB**(D+G)	**0**
S-LEG (E&F)	0	**SB**(C+H)	**0**
E-LEG (C&D)	0	**EB**(A+F)	**0**
W-LEG (G&H)	0	**WB**(B+E)	**0**

TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS											
07:00 AM	---	08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	---	08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	---	08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	---	08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	---	09:00 AM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

7:15 AM to 8:15 AM

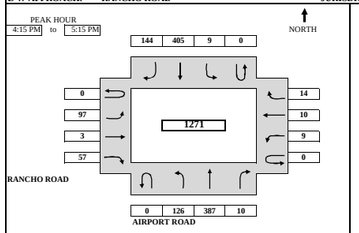
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

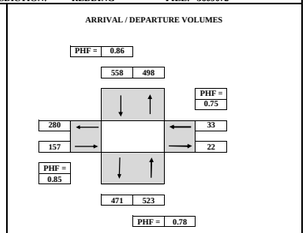
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: AIRPORT ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM to 5:15 PM





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		21	101	3		1	94	34		29	3	18		1	2	3	**310**
4:15 PM	4:30 PM		51	199	6		6	192	71		54	5	31		3	5	7	**630**
4:30 PM	4:45 PM		78	299	8		7	277	102		78	5	46		7	7	12	**926**
4:45 PM	5:00 PM		105	365	11		8	379	137		104	6	65		8	9	14	**1211**
5:00 PM	5:15 PM		147	488	13		10	499	178		126	6	75		10	12	17	**1581**
5:15 PM	5:30 PM		176	571	14		11	590	209		154	9	96		12	16	21	**1879**
5:30 PM	5:45 PM		204	651	14		13	661	236		181	12	110		15	17	22	**2136**
5:45 PM	6:00 PM		224	718	15		14	707	260		206	13	121		16	20	22	**2336**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	21	101	3	0	1	94	34	0	29	3	18	0	1	2	3	**310**
4:15 PM	4:30 PM	0	30	98	3	0	5	98	37	0	25	2	13	0	2	3	4	**320**
4:30 PM	4:45 PM	0	27	100	2	0	1	85	31	0	24	0	15	0	4	2	5	**296**
4:45 PM	5:00 PM	0	27	66	3	0	1	102	35	0	26	1	19	0	1	2	2	**285**
5:00 PM	5:15 PM	0	42	123	2	0	2	120	41	0	22	0	10	0	2	3	3	**370**
5:15 PM	5:30 PM	0	29	83	1	0	1	91	31	0	28	3	21	0	2	4	4	**298**
5:30 PM	5:45 PM	0	28	80	0	0	2	71	27	0	27	3	14	0	3	1	1	**257**
5:45 PM	6:00 PM	0	20	67	1	0	1	46	24	0	25	1	11	0	1	3	0	**200**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	105	365	11	0	8	379	137	0	104	6	65	0	8	9	14	**1211**
4:15 PM	5:15 PM	0	126	387	10	0	9	405	144	0	97	3	57	0	9	10	14	**1271**
4:30 PM	5:30 PM	0	125	372	8	0	5	398	138	0	100	4	65	0	9	11	14	**1249**
4:45 PM	5:45 PM	0	126	352	6	0	6	384	134	0	103	7	64	0	8	10	10	**1210**
5:00 PM	6:00 PM	0	119	353	4	0	6	328	123	0	102	7	56	0	8	11	8	**1125**

PEAK HOUR SUMMARY

4:15 PM to 5:15 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	126	387	10	0	9	405	144	0	97	3	57	0	9	10	14	**1271**
PHF BY MOVEMENT	0.00	0.75	0.79	0.83	0.00	0.45	0.84	0.88	0.00	0.93	0.38	0.75	0.00	0.56	0.83	0.70	OVERALL
PHF BY APPROACH	0.78				0.86				0.85				0.75				0.86
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	9		8		15		12		0		1		3		6		**27**
TRUCK PERCENTAGE	1.7%		1.6%		2.7%		2.5%		0.0%		4.5%		9.1%		2.1%		**2.1%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR	0				1				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY DIR	0				0				0				1				**1**

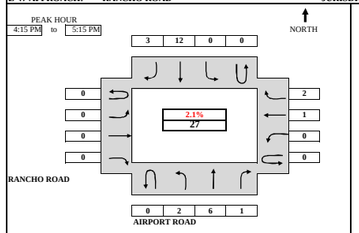
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

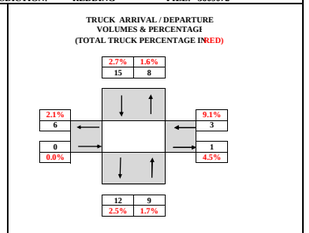
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: AIRPORT ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:15 PM to 5:15 PM





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0	1		4	0			0	1			0	0		**6**
4:15 PM	4:30 PM		1	2	1		10	1			1	0			0	1		**17**
4:30 PM	4:45 PM		2	4	2		13	1			0	1			1	1		**24**
4:45 PM	5:00 PM		2	4	2		15	1			0	1			1	1		**27**
5:00 PM	5:15 PM		2	6	2		16	3			0	1			1	2		**33**
5:15 PM	5:30 PM		3	9	2		18	4			1	2			1	2		**42**
5:30 PM	5:45 PM		5	9	2		18	5			1	2			2	3		**47**
5:45 PM	6:00 PM		5	10	2		19	5			1	3			2	3		**50**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	1	0	0	4	0	0	0	1	0	0	0	0	0	**6**
4:15 PM	4:30 PM	0	1	2	0	0	0	6	1	0	0	0	0	0	0	0	1	**11**
4:30 PM	4:45 PM	0	1	2	1	0	0	3	0	0	0	0	0	0	0	0	0	**7**
4:45 PM	5:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	**3**
5:00 PM	5:15 PM	0	0	2	0	0	0	1	2	0	0	0	0	0	0	0	1	**6**
5:15 PM	5:30 PM	0	1	3	0	0	0	2	1	0	1	0	1	0	0	0	0	**9**
5:30 PM	5:45 PM	0	2	0	0	0	0	0	1	0	0	0	0	0	0	1	1	**5**
5:45 PM	6:00 PM	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	**3**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	2	4	2	0	0	15	1	0	0	0	1	0	0	1	1	**27**
4:15 PM	5:15 PM	0	2	6	1	0	0	12	3	0	0	0	0	0	0	1	2	**27**
4:30 PM	5:30 PM	0	2	7	1	0	0	8	3	0	1	0	1	0	0	1	1	**25**
4:45 PM	5:45 PM	0	3	5	0	0	0	5	4	0	1	0	1	0	0	2	2	**23**
5:00 PM	6:00 PM	0	3	6	0	0	0	4	4	0	1	0	2	0	0	1	2	**23**

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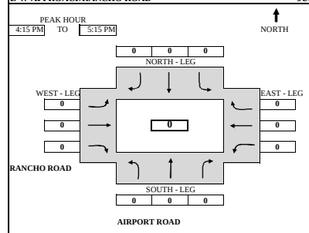
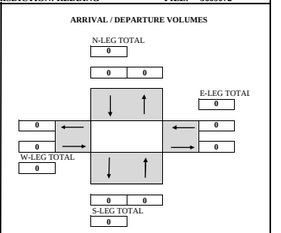
4:15 PM to 5:15 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	9	8	15	12	0	1	3	6	27
TRUCK PERCENTAGE	1.7%	1.6%	2.7%	2.5%	0.0%	4.5%	9.1%	2.1%	2.1%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: AIRPORT ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

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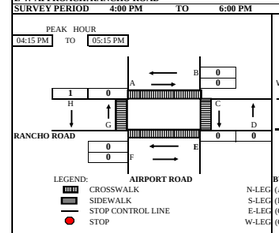
4:15 PM to 5:15 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: AIRPORT ROAD — **DAY:** WEDNESDAY
E-W APPROACH: RANCHO ROAD — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM **TO** 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:15 PM TO 05:15 PM



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	1	***1***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	1	***1***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	1	***1***
05:15 PM	--- 05:30 PM	0	1	0	0	0	0	0	1	***2***
05:30 PM	--- 05:45 PM	0	1	0	0	0	0	0	1	***2***
05:45 PM	--- 06:00 PM	0	1	0	0	0	0	0	1	***2***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	0	0	0	1	***1***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	--- 05:30 PM	0	1	0	0	0	0	0	0	***1***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	0	0	0	1	***1***
04:15 PM	--- 05:15 PM	0	0	0	0	0	0	0	1	***1***
04:30 PM	--- 05:30 PM	0	1	0	0	0	0	0	1	***2***
04:45 PM	--- 05:45 PM	0	1	0	0	0	0	0	1	***2***
05:00 PM	--- 06:00 PM	0	1	0	0	0	0	0	1	***2***

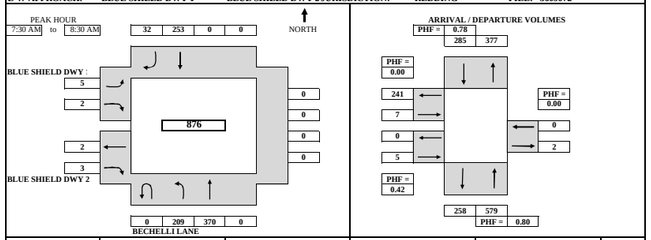
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

4:15 PM to 5:15 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	1	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	1	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016 **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: BLUE SHIELD DWY 1 - BLUE SHIELD DWY 2 **JURISDICTION:** REDDING **FILE:** 3609072



TIME PERIOD	NORTHBOUND				SOUTHBOUND				DRIVEWAYS				WESTBOUND				TOTAL
From To	U-TURN	1 IN	THRU	RIGHT	U-TURN	RIGHT	THRU	1 IN	1 OUT	1 OUT	2 IN	2 OUT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																	
7:00 AM to 7:15 AM		22	49			40	5		0	1	0	0					**117**
7:15 AM to 7:30 AM		44	138			81	10		0	1	1	0					**275**
7:30 AM to 7:45 AM		91	236			155	21		1	1	2	0					**507**
7:45 AM to 8:00 AM		156	352			231	36		5	2	3	0					**785**
8:00 AM to 8:15 AM		185	419			288	38		5	3	3						**944**
8:15 AM to 8:30 AM		253	508			334	42		5	3	3	3					**1151**
8:30 AM to 8:45 AM		220	582			386	42		5	4	4	3					**1246**
8:45 AM to 9:00 AM		242	669			440	43		5	5	4	4					**1412**
TOTAL BY PERIOD																	
7:00 AM to 7:15 AM	0	22	49	0	0	0	40	5	0	1	0	0	0	0	0	0	**117**
7:15 AM to 7:30 AM	0	22	89	0	0	0	41	5	0	0	1	0	0	0	0	0	**158**
7:30 AM to 7:45 AM	0	47	98	0	0	0	74	11	1	0	1	0	0	0	0	0	**232**
7:45 AM to 8:00 AM	0	65	116	0	0	0	76	15	4	1	1	0	0	0	0	0	**278**
8:00 AM to 8:15 AM	0	29	67	0	0	0	57	2	0	1	0	3	0	0	0	0	**159**
8:15 AM to 8:30 AM	0	68	89	0	0	0	46	4	0	0	0	0	0	0	0	0	**207**
8:30 AM to 8:45 AM	0	-33	74	0	0	0	52	0	0	1	1	0	0	0	0	0	**95**
8:45 AM to 9:00 AM	0	22	87	0	0	0	54	1	0	1	0	1	0	0	0	0	**166**
HOURLY TOTALS																	
7:00 AM to 8:00 AM	0	156	352	0	0	0	231	36	5	2	3	3	0	0	0	0	**785**
7:15 AM to 8:15 AM	0	163	370	0	0	0	248	33	5	2	3	3	0	0	0	0	**827**
7:30 AM to 8:30 AM	0	209	370	0	0	0	253	32	5	2	2	3	0	0	0	0	**876**
7:45 AM to 8:45 AM	0	129	346	0	0	0	231	21	4	3	2	3	0	0	0	0	**739**
8:00 AM to 9:00 AM	0	86	317	0	0	0	209	7	0	2	1	4	0	0	0	0	**627**
PEAK HOUR SUMMARY																	
7:30 AM to 8:30 AM	**NORTHBOUND**				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				TOTAL
	U-TURN	1 IN	THRU	RIGHT	U-TURN	RIGHR	THRU	1 IN	1 OUT	1 OUT	2 IN	2 OUT	U-TURN	LEFT	THRU	RIGHT	
VOLUME	0	209	370	0	0	0	253	32	5	2	2	3	0	0	0	0	**876**
PHF BY MOVEMENT	0.00	0.77	0.80	0.00	0.00	0.00	0.83	0.53	0.31	0.50	0.50	0.25	0.00	0.00	0.00	0.00	OVERALL
PHF BY APPROACH		0.80				0.78			0.35		0.42			0.00			0.79
TRUCK	IN		OUT		IN		OUT		IN	OUT	IN	OUT	IN		OUT		OVERALL
TRUCK VOLUMES	9		9		5		5		0	0	0	0	0		0		**14**
TRUCK PERCENTAGE	1.6%		2.4%		1.8%		1.9%		0.0%	0.0%	0.0%	0.0%	0.0%		0.0%		**1.6%**
BICYCLE	1				0				0				0				**1**
PEDESTRIAN BY DIR:	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				0				**0**

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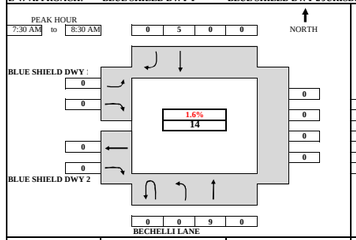
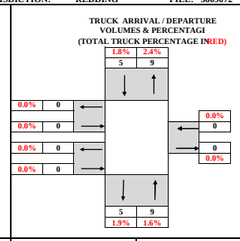
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016 **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: BLUE SHIELD DWY 1 - BLUE SHIELD DWY 2 **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From To	U-TURN	1 IN	THRU	RIGHT	U-TURN	RIGHR	THRU	1 IN	1 OUT	1 OUT	2 IN	2 OUT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																	
7:00 AM to 7:15 AM		1				2											**3**
7:15 AM to 7:30 AM		1				2											**3**
7:30 AM to 7:45 AM		2				4											**6**
7:45 AM to 8:00 AM		4				6											**10**
8:00 AM to 8:15 AM		7				7											**14**
8:15 AM to 8:30 AM		10				7											**17**
8:30 AM to 8:45 AM		11				9											**20**
8:45 AM to 9:00 AM		14				12											**26**
TOTAL BY PERIOD																	
7:00 AM to 7:15 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	**3**
7:15 AM to 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM to 7:45 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	**3**
7:45 AM to 8:00 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	**4**
8:00 AM to 8:15 AM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	**4**
8:15 AM to 8:30 AM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
8:30 AM to 8:45 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	**3**
8:45 AM to 9:00 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	**6**
HOURLY TOTALS																	
7:00 AM to 8:00 AM	0	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	**10**
7:15 AM to 8:15 AM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0	**11**
7:30 AM to 8:30 AM	0	0	9	0	0	0	5	0	0	0	0	0	0	0	0	0	**14**
7:45 AM to 8:45 AM	0	0	9	0	0	0	5	0	0	0	0	0	0	0	0	0	**14**
8:00 AM to 9:00 AM	0	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0	**16**

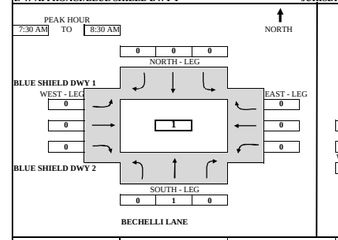
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

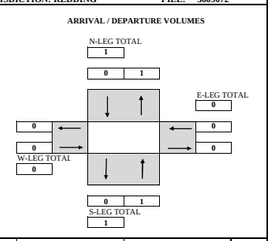
7:30 AM to 8:30 AM																
DIRECTION	NB		SB		DW-1		DW-2		WB		OVERALL					
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION					
TRUCK VOLUMES	9	9	5	5	0	0	0	0	0	0	14					
TRUCK PERCENTAGE	1.6%	2.4%	1.8%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%					

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016 **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: BLUE SHIELD DWY 1 **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD	NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA													
7:00 AM to 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM to 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM to 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM to 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM to 8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:15 AM to 8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:30 AM to 8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:45 AM to 9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
TOTAL BY PERIOD													
7:00 AM to 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM to 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM to 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM to 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM to 8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:15 AM to 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM to 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM to 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS													
7:00 AM to 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM to 8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:30 AM to 8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:45 AM to 8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM to 9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**

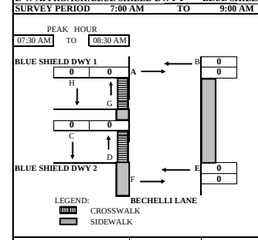
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

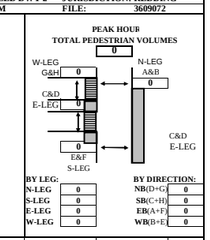
7:30 AM to 8:30 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	1	0	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016
N-S APPROACH: BECHELLI LANE **DAY:** WEDNESDAY
E-W APPROACH: BLUE SHIELD DWY 1 **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM **TO** 9:00 AM **FILE:** 3609072





TIME PERIOD	NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA									
07:00 AM --- 07:15 AM	0	0	0	1	0	0	1	0	***2***
07:15 AM --- 07:30 AM	0	0	0	1	0	0	1	0	***2***
07:30 AM --- 07:45 AM	0	0	0	1	0	0	1	0	***2***
07:45 AM --- 08:00 AM	0	0	0	1	0	0	1	0	***2***
08:00 AM --- 08:15 AM	0	0	0	1	0	0	1	0	***2***
08:15 AM --- 08:30 AM	0	0	0	1	0	0	1	0	***2***
08:30 AM --- 08:45 AM	0	0	0	1	0	0	1	0	***2***
08:45 AM --- 09:00 AM	0	0	0	1	0	0	1	1	***4***
TOTAL BY PERIOD									
07:00 AM --- 07:15 AM	0	0	0	1	0	0	1	0	***2***
07:15 AM --- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM --- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM --- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM --- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM --- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM --- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM --- 09:00 AM	0	0	0	0	0	0	0	1	***2***
HOURLY TOTALS									
07:00 AM --- 08:00 AM	0	0	0	1	0	0	1	0	***2***
07:15 AM --- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM --- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM --- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM --- 09:00 AM	0	0	0	1	0	0	0	1	***2***

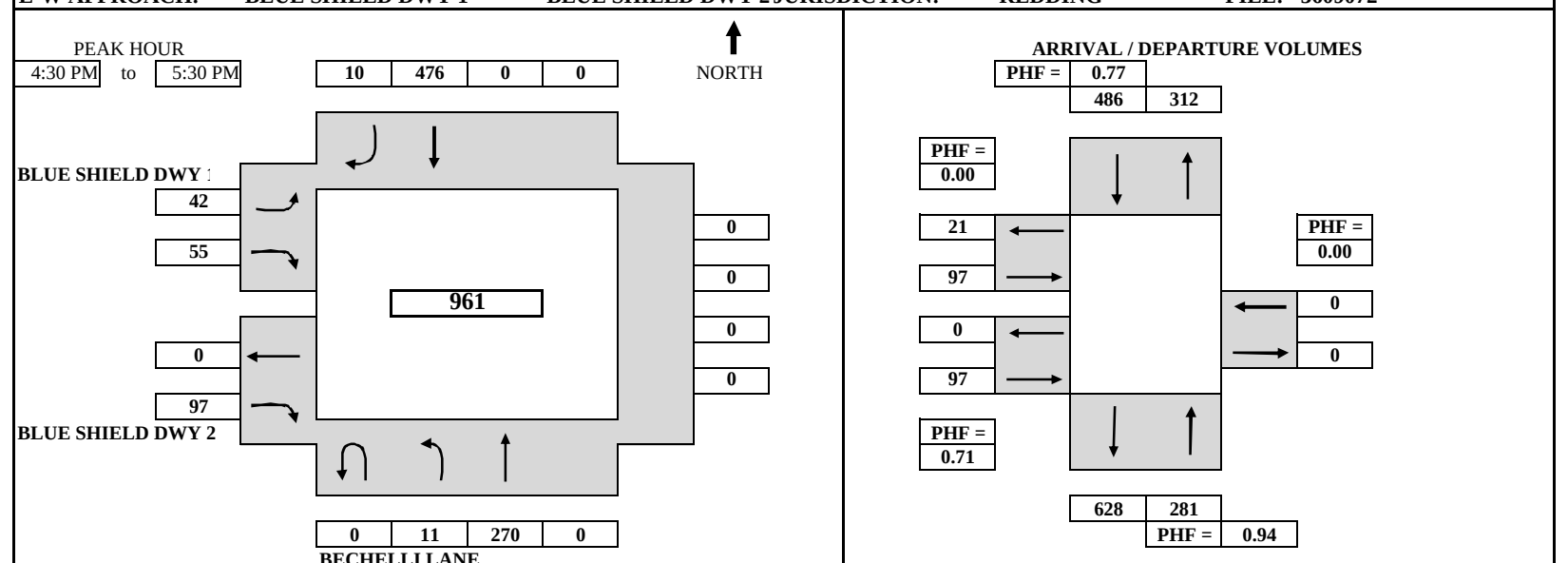
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

7:30 AM to 8:30 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN REDDING	SURVEY DATE:	9/14/2016	DAY:	WEDNESDAY
N-S APPROACH:	BECHELLI LANE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	BLUE SHIELD DWY 1 - BLUE SHIELD DWY 2	JURISDICTION:	REDDING	FILE:	3609072



TIME PERIOD From – To	NB U-TURN	NB 1 IN	NB THRU	NB RIGHT	SB U-TURN	SB RIGHR	SB THRU	SB 1 IN	DRIVEWAYS 1 OUT	DRIVEWAYS 1 OUT	DRIVEWAYS 2 IN	DRIVEWAYS 2 OUT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																	
4:00 PM to 4:15 PM		1	69				101	1	5	6	0	11					194
4:15 PM to 4:30 PM		2	145				184	1	6	10	0	15					363
4:30 PM to 4:45 PM		7	215				280	3	25	40	0	46					616
4:45 PM to 5:00 PM		9	284				377	8	32	47	0	67					824
5:00 PM to 5:15 PM		9	344				533	9	42	61	0	101					1099
5:15 PM to 5:30 PM		13	415				660	11	48	65	0	112					1324
5:30 PM to 5:45 PM		14	487				760	11	55	77	0	138					1542
5:45 PM to 6:00 PM		15	550				840	11	59	81	0	148					1704
TOTAL BY PERIOD																	
4:00 PM to 4:15 PM	0	1	69	0	0	0	101	1	5	6	0	11	0	0	0	0	194
4:15 PM to 4:30 PM	0	1	76	0	0	0	83	0	1	4	0	4	0	0	0	0	169
4:30 PM to 4:45 PM	0	5	70	0	0	0	96	2	19	30	0	31	0	0	0	0	253
4:45 PM to 5:00 PM	0	2	69	0	0	0	97	5	7	7	0	21	0	0	0	0	208
5:00 PM to 5:15 PM	0	0	60	0	0	0	156	1	10	14	0	34	0	0	0	0	275
5:15 PM to 5:30 PM	0	4	71	0	0	0	127	2	6	4	0	11	0	0	0	0	225
5:30 PM to 5:45 PM	0	1	72	0	0	0	100	0	7	12	0	26	0	0	0	0	218
5:45 PM to 6:00 PM	0	1	63	0	0	0	80	0	4	4	0	10	0	0	0	0	162
HOURLY TOTALS																	
4:00 PM to 5:00 PM	0	9	284	0	0	0	377	8	32	47	0	67	0	0	0	0	824
4:15 PM to 5:15 PM	0	8	275	0	0	0	432	8	37	55	0	90	0	0	0	0	905
4:30 PM to 5:30 PM	0	11	270	0	0	0	476	10	42	55	0	97	0	0	0	0	961
4:45 PM to 5:45 PM	0	7	272	0	0	0	480	8	30	37	0	92	0	0	0	0	926
5:00 PM to 6:00 PM	0	6	266	0	0	0	463	3	27	34	0	81	0	0	0	0	880

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	U-TURN	1 IN	THRU	RIGHT	U-TURN	RIGHR	THRU	1 IN	1 OUT	1 OUT	2 IN	2 OUT	U-TURN	LEFT	THRU	RIGHT	
VOLUME	0	11	270	0	0	0	476	10	42	55	0	97	0	0	0	0	961
PHF BY MOVEMENT	0.00	0.55	0.95	0.00	0.00	0.00	0.76	0.50	0.55	0.46	0.00	0.71	0.00	0.00	0.00	0.00	OVERALL
PHF BY APPROACH	0.94				0.77				0.49		0.71		0.00				0.87
TRUCK	IN		OUT		IN		OUT		IN	OUT	IN	OUT	IN		OUT		OVERALL
TRUCK VOLUMES	2		2		6		6		0	0	0	0	0		0		8
TRUCK PERCENTAGE	0.7%		0.6%		1.2%		1.0%		0.0%	0.0%	0.0%	0.0%	0.0%		0.0%		0.8%
BICYCLE	0				0				0				0				0
PEDESTRIAN BY DIR:	0				2				0				0				2
	N-LEG				S-LEG				E-LEG				W-LEG				
PEDESTRIAN BY LEG	0				0				0				1				1

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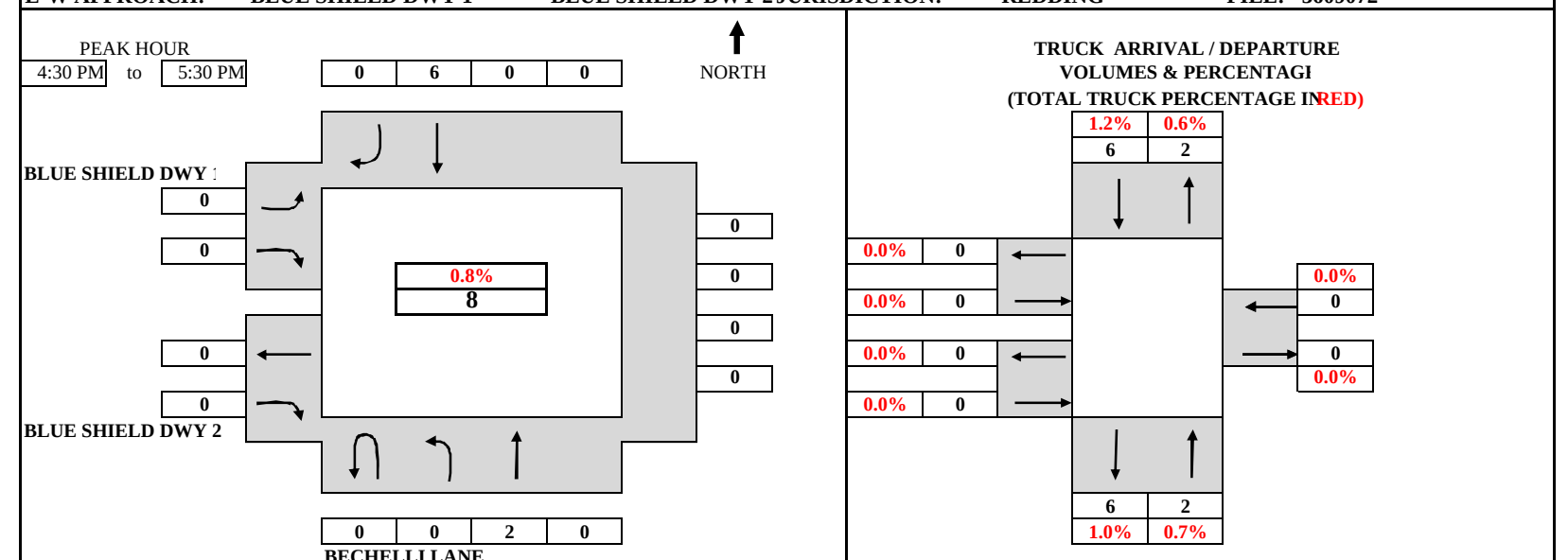
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN REDDING	SURVEY DATE:	9/14/2016	DAY:	WEDNESDAY
N-S APPROACH:	BECHELLI LANE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	BLUE SHIELD DWY 1 - BLUE SHIELD DWY 2	JURISDICTION:	REDDING	FILE:	3609072



TIME PERIOD From – To	NB U-TURN	NB 1 IN	NB THRU	NB RIGHT	SB U-TURN	SB RIGHR	SB THRU	SB 1 IN	EB 1 OUT	EB 1 OUT	EB 2 IN	EB 2 OUT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																	
4:00 PM to 4:15 PM			0				2										2
4:15 PM to 4:30 PM			2				5										7
4:30 PM to 4:45 PM			2				6										8
4:45 PM to 5:00 PM			3				6										9
5:00 PM to 5:15 PM			3				8										11
5:15 PM to 5:30 PM			4				11										15
5:30 PM to 5:45 PM			5				11										16
5:45 PM to 6:00 PM			5				12										17
TOTAL BY PERIOD																	
4:00 PM to 4:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
4:15 PM to 4:30 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	5
4:30 PM to 4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:45 PM to 5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM to 5:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
5:15 PM to 5:30 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4
5:30 PM to 5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM to 6:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
HOURLY TOTALS																	
4:00 PM to 5:00 PM	0	0	3	0	0	0	6	0	0	0	0	0	0	0	0	0	9
4:15 PM to 5:15 PM	0	0	3	0	0	0	6	0	0	0	0	0	0	0	0	0	9
4:30 PM to 5:30 PM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	8
4:45 PM to 5:45 PM	0	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	8
5:00 PM to 6:00 PM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	8

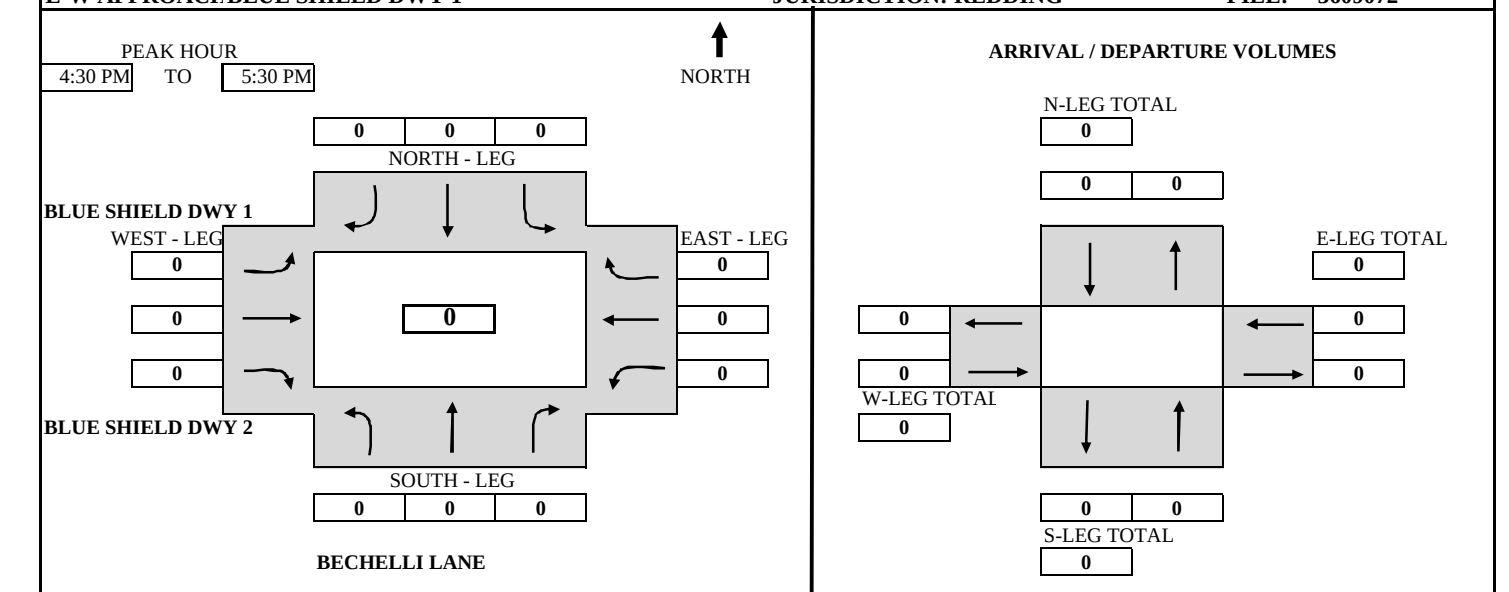
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

4:30 PM to 5:30 PM	NB		SB		DW-1		DW-2		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	2	2	6	6	0	0	0	0	0	0	8
TRUCK PERCENTAGE	0.7%	0.6%	1.2%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN REDDING	SURVEY DATE:	9/14/2016	DAY:	WEDNESDAY
N-S APPROACH:	BECHELLI LANE	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	BLUE SHIELD DWY 1	JURISDICTION:	REDDING	FILE:	3609072



TIME PERIOD From – To	NB (SOUTH - LEG) LEFT	NB THRU	NB RIGHT	SB (NORTH - LEG) LEFT	SB THRU	SB RIGHT	EB (WEST - LEG) LEFT	EB THRU	EB RIGHT	WB (EAST - LEG) LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA													
4:00 PM to 4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
4:15 PM to 4:30 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
4:30 PM to 4:45 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
4:45 PM to 5:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
5:00 PM to 5:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
5:15 PM to 5:30 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
5:30 PM to 5:45 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
5:45 PM to 6:00 PM	0	1	0	0	2	0	0	0	0	0	0	0	3
TOTAL BY PERIOD													
4:00 PM to 4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
4:15 PM to 4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
4:30 PM to 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM to 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM to 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM to 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM to 6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
HOURLY TOTALS													
4:00 PM to 5:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
4:15 PM to 5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
4:30 PM to 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM to 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM to 6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1

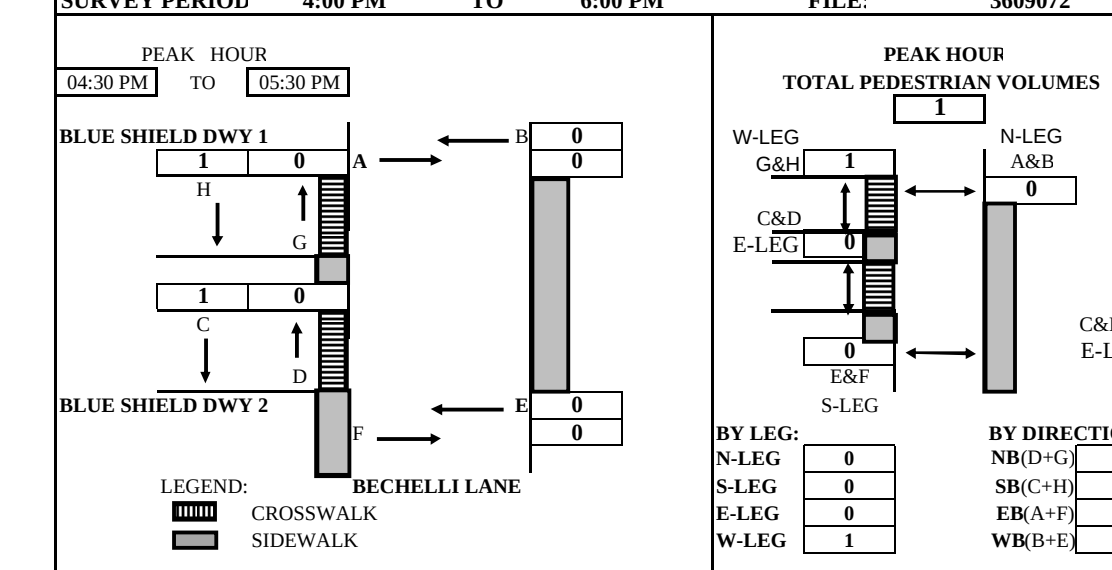
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

4:30 PM to 5:30 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	0

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	TRAFFIC COUNTS IN REDDING	SURVEY DATE:	9/14/2016
N-S APPROACH:	BECHELLI LANE	DAY:	WEDNESDAY
E-W APPROACH:	BLUE SHIELD DWY 1 BLUE SHIELD DWY 2	JURISDICTION:	REDDING
SURVEY PERIOD	4:00 PM TO 6:00 PM	FILE:	3609072



TIME PERIOD From – To	NORTH X-WALK A	NORTH X-WALK B	EAST X-WALK C	EAST X-WALK D	SOUTH X-WALK E	SOUTH X-WALK F	WEST X-WALK G	WEST X-WALK H	TOTAL
SURVEY DATA									
04:00 PM --- 04:15 PM	0	0	0	0	0	0	0	0	0
04:15 PM --- 04:30 PM	0	0	0	0	0	0	0	0	0
04:30 PM --- 04:45 PM	0	0	0	0	0	0	0	0	0
04:45 PM --- 05:00 PM	0	0	0	0	0	0	0	0	0
05:00 PM --- 05:15 PM	0	0	0	0	0	0	0	0	0
05:15 PM --- 05:30 PM	0	0	1	0	0	0	0	1	2
05:30 PM --- 05:45 PM	0	0	1	0	0	0	0	1	2
05:45 PM --- 06:00 PM	0	0	1	0	0	0	0	1	2
TOTAL BY PERIOD									
04:00 PM --- 04:15 PM	0	0	0	0	0	0	0	0	0
04:15 PM --- 04:30 PM	0	0	0	0	0	0	0	0	0
04:30 PM --- 04:45 PM	0	0	0	0	0	0	0	0	0
04:45 PM --- 05:00 PM	0	0	0	0	0	0	0	0	0
05:00 PM --- 05:15 PM	0	0	0	0	0	0	0	0	0
05:15 PM --- 05:30 PM	0	0	1	0	0	0	0	1	2
05:30 PM --- 05:45 PM	0	0	0	0	0	0	0	0	0
05:45 PM --- 06:00 PM	0	0	0	0	0	0	0	0	0
HOURLY TOTALS									
04:00 PM --- 05:00 PM	0	0	0	0	0	0	0	0	0
04:15 PM --- 05:15 PM	0	0	0	0	0	0	0	0	0
04:30 PM --- 05:30 PM	0	0	1	0	0	0	0	1	2
04:45 PM --- 05:45 PM	0	0	1	0	0	0	0	1	2
05:00 PM --- 06:00 PM	0	0	1	0	0	0	0	1	2

Tel : (510) 232-1271 *Fax: (510) 232-1272*

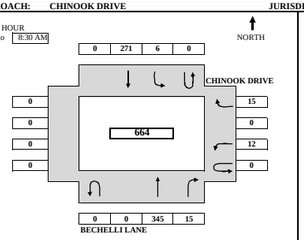
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	2	0	0	2
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	1	1

B.A.Y.M.E.T.R.I.C.S.

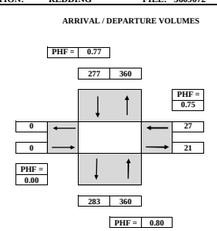
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:30 AM to 8:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM			46	1		1	42							3	2		**95**
7:15 AM	7:30 AM			132	2		3	86							4	3		**230**
7:30 AM	7:45 AM			229	6		4	175							9	7		**430**
7:45 AM	8:00 AM			339	9		5	258							11	11		**633**
8:00 AM	8:15 AM			399	12		7	309							13	15		**755**
8:15 AM	8:30 AM			477	17		9	357							16	18		**894**
8:30 AM	8:45 AM			539	22		9	404							20	18		**1012**
8:45 AM	9:00 AM			628	26		12	456							23	18		**1163**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	46	1	0	1	42	0	0	0	0	0	0	3	0	2	**95**
7:15 AM	7:30 AM	0	0	86	1	0	2	44	0	0	0	0	0	0	1	0	1	**135**
7:30 AM	7:45 AM	0	0	97	4	0	1	89	0	0	0	0	0	0	5	0	4	**200**
7:45 AM	8:00 AM	0	0	110	3	0	1	83	0	0	0	0	0	0	2	0	4	**203**
8:00 AM	8:15 AM	0	0	60	3	0	2	51	0	0	0	0	0	0	2	0	4	**122**
8:15 AM	8:30 AM	0	0	78	5	0	2	48	0	0	0	0	0	0	3	0	3	**139**
8:30 AM	8:45 AM	0	0	62	5	0	0	47	0	0	0	0	0	0	4	0	0	**118**
8:45 AM	9:00 AM	0	0	89	4	0	3	52	0	0	0	0	0	0	3	0	0	**151**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	339	9	0	5	258	0	0	0	0	0	0	11	0	11	**633**
7:15 AM	8:15 AM	0	0	353	11	0	6	267	0	0	0	0	0	0	10	0	13	**660**
7:30 AM	8:30 AM	0	0	345	15	0	6	271	0	0	0	0	0	0	12	0	15	**664**
7:45 AM	8:45 AM	0	0	310	16	0	5	229	0	0	0	0	0	0	11	0	11	**582**
8:00 AM	9:00 AM	0	0	289	17	0	7	198	0	0	0	0	0	0	12	0	7	**530**

PEAK HOUR SUMMARY

7:30 AM to 8:30 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	345	15	0	6	271	0	0	0	0	0	0	12	0	15	**664**
PHF BY MOVEMENT	0.00	0.00	0.78	0.75	0.00	0.75	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.94	OVERALL
PHF BY APPROACH	0.80				0.77				0.00				0.75				0.82
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	9		12		6		5		0		1		3		0		**18**
TRUCK PERCENTAGE	2.5%		3.3%		2.2%		1.8%		0.0%		4.8%		11.1%		0.0%		**2.7%**
BICYCLE	1				0				0				0				**1**
PEDESTRIAN BY DIR:	0				1				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				1				0				**1**

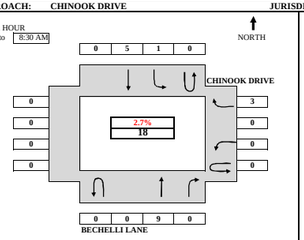
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

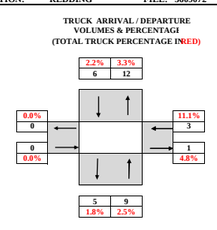
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:30 AM to 8:30 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM			1	1		0	3							0	0		**5**
7:15 AM	7:30 AM			2	2		0	5							0	0		**9**
7:30 AM	7:45 AM			3	2		0	7							0	1		**13**
7:45 AM	8:00 AM			5	2		0	9							0	2		**18**
8:00 AM	8:15 AM			8	2		1	10							0	2		**23**
8:15 AM	8:30 AM			11	2		1	10							0	3		**27**
8:30 AM	8:45 AM			13	2		1	12							0	3		**31**
8:45 AM	9:00 AM			14	3		1	15							0	3		**36**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	1	1	0	0	3	0	0	0	0	0	0	0	0	0	**5**
7:15 AM	7:30 AM	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	**4**
7:30 AM	7:45 AM	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	1	**4**
7:45 AM	8:00 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	1	**5**
8:00 AM	8:15 AM	0	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	**5**
8:15 AM	8:30 AM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	**4**
8:30 AM	8:45 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	**4**
8:45 AM	9:00 AM	0	0	1	1	0	0	3	0	0	0	0	0	0	0	0	0	**5**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	5	2	0	0	9	0	0	0	0	0	0	0	0	2	**18**
7:15 AM	8:15 AM	0	0	7	1	0	1	7	0	0	0	0	0	0	0	0	2	**18**
7:30 AM	8:30 AM	0	0	9	0	0	1	5	0	0	0	0	0	0	0	0	3	**18**
7:45 AM	8:45 AM	0	0	10	0	0	1	5	0	0	0	0	0	0	0	0	2	**18**
8:00 AM	9:00 AM	0	0	9	1	0	1	6	0	0	0	0	0	0	0	0	1	**18**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

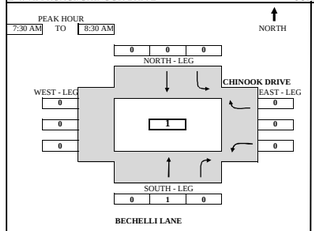
7:30 AM to 8:30 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	9	12	6	5	0	1	3	0	18
TRUCK PERCENTAGE	2.5%	3.3%	2.2%	1.8%	0.0%	4.8%	11.1%	0.0%	2.7%

B.A.Y.M.E.T.R.I.C.S.

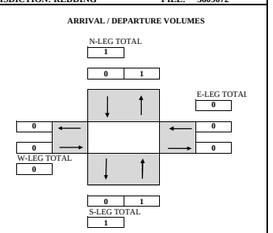
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:30 AM TO 8:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM	8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:15 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:30 AM	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:15 AM	8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:30 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:45 AM	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

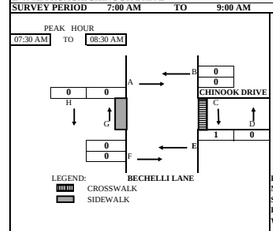
7:30 AM to 8:30 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	1	0	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

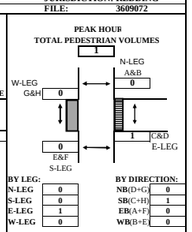
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: BECHELLI LANE — **DAY:** WEDNESDAY
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM **TO** 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:30 AM TO 08:30 AM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:		BY DIRECTION:	
N-LEG	0	NB(D+G)	0
S-LEG	0	SB(C+H)	1
E-LEG	1	EB(A+F)	0
W-LEG	0	WB(B+E)	0

TIME PERIOD		NORTH X-WALK	EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	1	0	0	0	0	0	***1***
07:45 AM	--- 08:00 AM	0	0	1	0	0	0	0	0	***1***
08:00 AM	--- 08:15 AM	0	0	1	0	0	0	0	0	***1***
08:15 AM	--- 08:30 AM	0	0	1	0	0	0	0	0	***1***
08:30 AM	--- 08:45 AM	0	0	1	0	0	0	0	0	***1***
08:45 AM	--- 09:00 AM	0	0	2	0	0	0	0	0	***2***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	1	0	0	0	0	0	***1***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	1	0	0	0	0	0	***1***
08:45 AM	--- 09:00 AM	0	0	1	0	0	0	0	0	***1***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	1	0	0	0	0	0	***1***
07:15 AM	--- 08:15 AM	0	0	1	0	0	0	0	0	***1***
07:30 AM	--- 08:30 AM	0	0	1	0	0	0	0	0	***1***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	1	0	0	0	0	0	***1***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

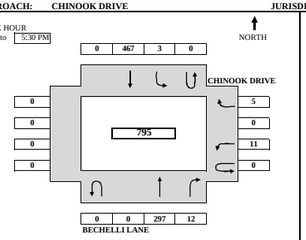
7:30 AM to 8:30 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	1	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

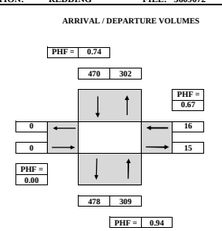
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM			69	5		2	89							4	1		**170**
4:15 PM	4:30 PM			134	10		7	161							5	7		**324**
4:30 PM	4:45 PM			211	15		7	250							8	8		**499**
4:45 PM	5:00 PM			285	17		9	348							9	8		**676**
5:00 PM	5:15 PM			363	18		10	506							13	10		**920**
5:15 PM	5:30 PM			431	22		10	628							16	12		**1119**
5:30 PM	5:45 PM			499	26		13	721							20	14		**1293**
5:45 PM	6:00 PM			566	28		14	805							23	15		**1451**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	69	5	0	2	89	0	0	0	0	0	0	4	0	1	**170**
4:15 PM	4:30 PM	0	0	65	5	0	5	72	0	0	0	0	0	0	1	0	6	**154**
4:30 PM	4:45 PM	0	0	77	5	0	0	89	0	0	0	0	0	0	3	0	1	**175**
4:45 PM	5:00 PM	0	0	74	2	0	2	98	0	0	0	0	0	0	1	0	0	**177**
5:00 PM	5:15 PM	0	0	78	1	0	1	158	0	0	0	0	0	0	4	0	2	**244**
5:15 PM	5:30 PM	0	0	68	4	0	0	122	0	0	0	0	0	0	3	0	2	**199**
5:30 PM	5:45 PM	0	0	68	4	0	3	93	0	0	0	0	0	0	4	0	2	**174**
5:45 PM	6:00 PM	0	0	67	2	0	1	84	0	0	0	0	0	0	3	0	1	**158**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	285	17	0	9	348	0	0	0	0	0	0	9	0	8	**676**
4:15 PM	5:15 PM	0	0	294	13	0	8	417	0	0	0	0	0	0	9	0	9	**750**
4:30 PM	5:30 PM	0	0	297	12	0	3	467	0	0	0	0	0	0	11	0	5	**795**
4:45 PM	5:45 PM	0	0	288	11	0	6	471	0	0	0	0	0	0	12	0	6	**794**
5:00 PM	6:00 PM	0	0	281	11	0	5	457	0	0	0	0	0	0	14	0	7	**775**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	297	12	0	3	467	0	0	0	0	0	0	11	0	5	**795**
PHF BY MOVEMENT	0.00	0.00	0.95	0.60	0.00	0.38	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.63	OVERALL
PHF BY APPROACH	0.94				0.74				0.00				0.67				0.81
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	2		2		6		6		0		0		0		0		**8**
TRUCK PERCENTAGE	0.6%		0.7%		1.3%		1.3%		0.0%		0.0%		0.0%		0.0%		**1.0%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				1				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				1				0				**1**

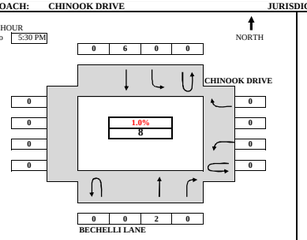
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

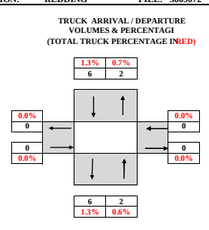
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE INCLUDED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0			0	1							0	0		**1**
4:15 PM	4:30 PM		1	0			0	4							0	0		**5**
4:30 PM	4:45 PM		1	0			0	5							0	0		**6**
4:45 PM	5:00 PM		2	0			0	6							0	0		**8**
5:00 PM	5:15 PM		2	0			0	7							0	0		**9**
5:15 PM	5:30 PM		3	0			0	10							0	0		**13**
5:30 PM	5:45 PM		4	0			0	10							0	0		**14**
5:45 PM	6:00 PM		4	0			0	11							0	0		**15**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
4:15 PM	4:30 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	**4**
4:30 PM	4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
5:00 PM	5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
5:15 PM	5:30 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	**4**
5:30 PM	5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	**8**
4:15 PM	5:15 PM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	**8**
4:30 PM	5:30 PM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	**8**
4:45 PM	5:45 PM	0	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	**8**
5:00 PM	6:00 PM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0	**7**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

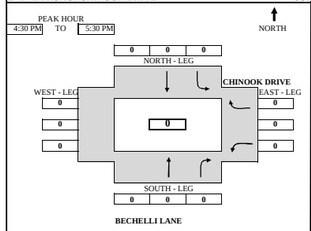
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	2	2	6	6	0	0	0	0	**8**
TRUCK PERCENTAGE	0.6%	0.7%	1.3%	1.3%	0.0%	0.0%	0.0%	0.0%	1.0%

B.A.Y.M.E.T.R.I.C.S.

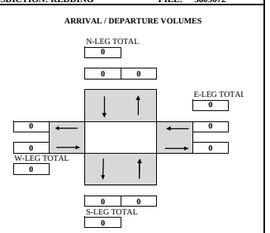
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:15 PM	5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:30 PM	5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	**2**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:15 PM	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:45 PM	5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:00 PM	6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

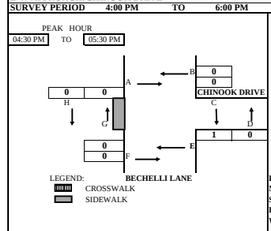
4:30 PM to 5:30 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH					
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

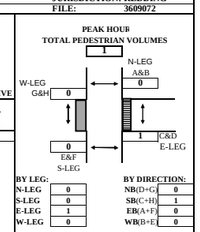
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: BECHELLI LANE — **DAY:** WEDNESDAY
E-W APPROACH: CHINOOK DRIVE — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 04:30 PM TO 05:30 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:	
N-LEG	0
S-LEG	0
E-LEG	1
W-LEG	0

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	1
EB(A+F)	0
WB(B+E)	0

TIME PERIOD		NORTH X-WALK	EAST X-WALK			SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	05:15 PM	0	0	1	0	0	0	0	0	*1*
05:15 PM	05:30 PM	0	0	1	0	0	0	0	0	*1*
05:30 PM	05:45 PM	0	0	1	0	0	0	0	0	*1*
05:45 PM	06:00 PM	0	0	1	0	0	0	0	0	*1*
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	05:15 PM	0	0	1	0	0	0	0	0	*1*
05:15 PM	05:30 PM	0	0	1	0	0	0	0	0	*1*
05:30 PM	05:45 PM	0	0	1	0	0	0	0	0	*1*
05:45 PM	06:00 PM	0	0	1	0	0	0	0	0	*1*
HOURLY TOTALS										
04:00 PM	05:00 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	05:15 PM	0	0	1	0	0	0	0	0	*1*
04:30 PM	05:30 PM	0	0	1	0	0	0	0	0	*1*
04:45 PM	05:45 PM	0	0	1	0	0	0	0	0	*1*
05:00 PM	06:00 PM	0	0	1	0	0	0	0	0	*1*

Tel : (510) 232-1271 *Fax: (510) 232-1272*

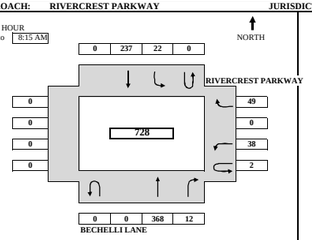
4:30 PM to 5:30 PM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION					
PEDESTRIAN	0	1	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

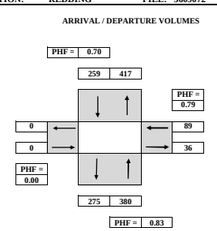
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM			46	4		1	36							0	5	3	**95**
7:15 AM	7:30 AM			129	5		3	68							0	13	19	**237**
7:30 AM	7:45 AM			238	6		12	152							2	25	33	**468**
7:45 AM	8:00 AM			348	10		16	228							2	34	43	**681**
8:00 AM	8:15 AM			414	16		23	273							2	43	52	**823**
8:15 AM	8:30 AM			493	19		25	315							3	49	59	**963**
8:30 AM	8:45 AM			563	23		28	363							3	52	66	**1098**
8:45 AM	9:00 AM			649	26		31	413							3	58	75	**1255**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	46	4	0	1	36	0	0	0	0	0	0	5	0	3	**95**
7:15 AM	7:30 AM	0	0	83	1	0	2	32	0	0	0	0	0	0	8	0	16	**142**
7:30 AM	7:45 AM	0	0	109	1	0	9	84	0	0	0	0	0	2	12	0	14	**231**
7:45 AM	8:00 AM	0	0	110	4	0	4	76	0	0	0	0	0	0	9	0	10	**213**
8:00 AM	8:15 AM	0	0	66	6	0	7	45	0	0	0	0	0	0	9	0	9	**142**
8:15 AM	8:30 AM	0	0	79	3	0	2	42	0	0	0	0	0	1	6	0	7	**140**
8:30 AM	8:45 AM	0	0	70	4	0	3	48	0	0	0	0	0	0	3	0	7	**135**
8:45 AM	9:00 AM	0	0	86	3	0	3	50	0	0	0	0	0	0	6	0	9	**157**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	348	10	0	16	228	0	0	0	0	0	2	34	0	43	**681**
7:15 AM	8:15 AM	0	0	368	12	0	22	237	0	0	0	0	0	2	38	0	49	**728**
7:30 AM	8:30 AM	0	0	364	14	0	22	247	0	0	0	0	0	3	36	0	40	**726**
7:45 AM	8:45 AM	0	0	325	17	0	16	211	0	0	0	0	0	1	27	0	33	**630**
8:00 AM	9:00 AM	0	0	301	16	0	15	185	0	0	0	0	0	1	24	0	32	**574**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	368	12	0	22	237	0	0	0	0	0	2	38	0	49	**728**
PHF BY MOVEMENT	0.00	0.00	0.84	0.50	0.00	0.61	0.71	0.00	0.00	0.00	0.00	0.00	0.25	0.79	0.00	0.77	OVERALL
PHF BY APPROACH	0.83				0.70				0.00				0.79				0.79
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	8		8		8		8		0		6		6		0		**22**
TRUCK PERCENTAGE	2.1%		1.9%		3.1%		2.9%		0.0%		16.7%		6.7%		0.0%		**3.0%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				1				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				1				0				**1**

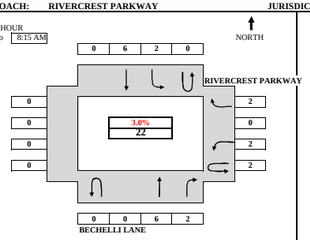
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

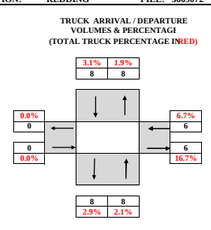
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM			0	1		0	2							0	0	0	**3**
7:15 AM	7:30 AM			1	1		1	3							0	0	2	**8**
7:30 AM	7:45 AM			3	1		1	7							2	0	2	**16**
7:45 AM	8:00 AM			5	2		2	8							2	0	2	**21**
8:00 AM	8:15 AM			6	3		2	8							2	2	2	**25**
8:15 AM	8:30 AM			10	3		3	9							2	2	2	**31**
8:30 AM	8:45 AM			12	3		3	12							2	2	2	**36**
8:45 AM	9:00 AM			13	3		3	15							2	2	2	**40**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	**3**
7:15 AM	7:30 AM	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2	**5**
7:30 AM	7:45 AM	0	0	2	0	0	0	4	0	0	0	0	0	2	0	0	0	**8**
7:45 AM	8:00 AM	0	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0	**5**
8:00 AM	8:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	**4**
8:15 AM	8:30 AM	0	0	4	0	0	1	1	0	0	0	0	0	0	0	0	0	**6**
8:30 AM	8:45 AM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	**5**
8:45 AM	9:00 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	**4**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	5	2	0	2	8	0	0	0	0	0	2	0	0	2	**21**
7:15 AM	8:15 AM	0	0	6	2	0	2	6	0	0	0	0	0	2	2	0	2	**22**
7:30 AM	8:30 AM	0	0	9	2	0	2	6	0	0	0	0	0	2	2	0	0	**23**
7:45 AM	8:45 AM	0	0	9	2	0	2	5	0	0	0	0	0	0	2	0	0	**20**
8:00 AM	9:00 AM	0	0	8	1	0	1	7	0	0	0	0	0	0	2	0	0	**19**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

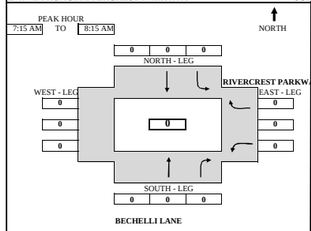
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	8	8	8	8	0	6	6	0	22
TRUCK PERCENTAGE	2.1%	1.9%	3.1%	2.9%	0.0%	16.7%	6.7%	0.0%	3.0%

B.A.Y.M.E.T.R.I.C.S.

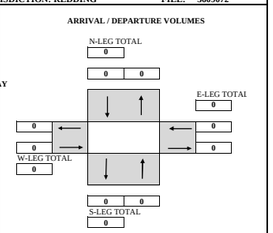
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:30 AM	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:45 AM	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

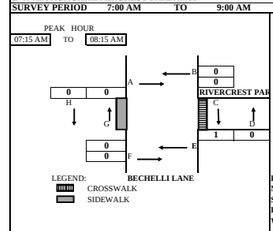
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

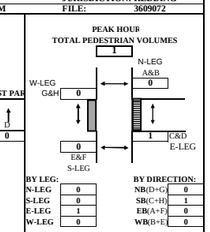
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: BECHELLI LANE — **DAY:** WEDNESDAY
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:

N-LEG	0
S-LEG	0
E-LEG	1
W-LEG	0

BY DIRECTION:

NB(D+G)	0
SB(C+H)	1
EB(A+F)	0
WB(B+E)	0

TIME PERIOD		NORTH X-WALK	EAST X-WALK			SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	1	0	0	0	0	0	***1***
07:45 AM	--- 08:00 AM	0	0	1	0	0	0	0	0	***1***
08:00 AM	--- 08:15 AM	0	0	1	0	0	0	0	0	***1***
08:15 AM	--- 08:30 AM	0	0	1	0	0	0	0	0	***1***
08:30 AM	--- 08:45 AM	0	0	2	0	0	0	0	0	***2***
08:45 AM	--- 09:00 AM	0	0	2	0	0	0	0	0	***2***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	1	0	0	0	0	0	***1***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	1	0	0	0	0	0	***1***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	1	0	0	0	0	0	***1***
07:15 AM	--- 08:15 AM	0	0	1	0	0	0	0	0	***1***
07:30 AM	--- 08:30 AM	0	0	1	0	0	0	0	0	***1***
07:45 AM	--- 08:45 AM	0	0	1	0	0	0	0	0	***1***
08:00 AM	--- 09:00 AM	0	0	1	0	0	0	0	0	***1***

Tel : (510) 232-1271 Fax: (510) 232-1272

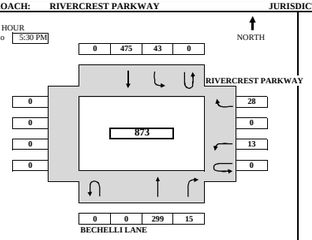
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	1	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

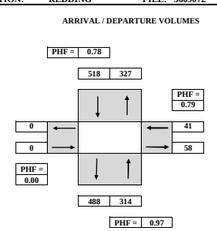
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		64	3		6	108								1	7		**189**
4:15 PM	4:30 PM		138	7		15	183								6	12		**361**
4:30 PM	4:45 PM		213	10		21	277								11	16		**548**
4:45 PM	5:00 PM		286	14		31	383								12	24		**750**
5:00 PM	5:15 PM		362	19		43	536								15	31		**1006**
5:15 PM	5:30 PM		437	22		58	658								19	40		**1234**
5:30 PM	5:45 PM		502	31		61	752								23	43		**1412**
5:45 PM	6:00 PM		569	38		68	833								29	49		**1586**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	64	3	0	6	108	0	0	0	0	0	0	1	0	7	**189**
4:15 PM	4:30 PM	0	0	74	4	0	9	75	0	0	0	0	0	0	5	0	5	**172**
4:30 PM	4:45 PM	0	0	75	3	0	6	94	0	0	0	0	0	0	5	0	4	**187**
4:45 PM	5:00 PM	0	0	73	4	0	10	106	0	0	0	0	0	0	1	0	8	**202**
5:00 PM	5:15 PM	0	0	76	5	0	12	153	0	0	0	0	0	0	3	0	7	**256**
5:15 PM	5:30 PM	0	0	75	3	0	15	122	0	0	0	0	0	0	4	0	9	**228**
5:30 PM	5:45 PM	0	0	65	9	0	3	94	0	0	0	0	0	0	4	0	3	**178**
5:45 PM	6:00 PM	0	0	67	7	0	7	81	0	0	0	0	0	0	6	0	6	**174**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	286	14	0	31	383	0	0	0	0	0	0	12	0	24	**750**
4:15 PM	5:15 PM	0	0	298	16	0	37	428	0	0	0	0	0	0	14	0	24	**817**
4:30 PM	5:30 PM	0	0	299	15	0	43	475	0	0	0	0	0	0	13	0	28	**873**
4:45 PM	5:45 PM	0	0	289	21	0	40	475	0	0	0	0	0	0	12	0	27	**864**
5:00 PM	6:00 PM	0	0	283	24	0	37	450	0	0	0	0	0	0	17	0	25	**836**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	299	15	0	43	475	0	0	0	0	0	0	13	0	28	**873**
PHF BY MOVEMENT	0.00	0.00	0.98	0.75	0.00	0.72	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.78	OVERALL
PHF BY APPROACH	0.97				0.78				0.00				0.79				0.85
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	2		2		6		6		0		1		1		0		**9**
TRUCK PERCENTAGE	0.6%		0.6%		1.2%		1.2%		0.0%		1.7%		2.4%		0.0%		**1.0%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				2				0				0				**2**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				2				0				**2**

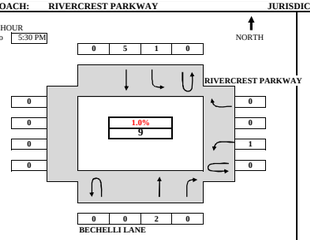
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

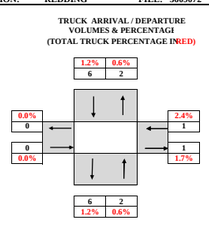
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0		0	2								0	0		**2**
4:15 PM	4:30 PM		2	0		0	4								0	0		**6**
4:30 PM	4:45 PM		2	0		0	5								0	0		**7**
4:45 PM	5:00 PM		3	0		1	6								0	0		**10**
5:00 PM	5:15 PM		3	0		1	7								1	0		**12**
5:15 PM	5:30 PM		4	0		1	9								1	0		**15**
5:30 PM	5:45 PM		5	0		1	10								1	0		**17**
5:45 PM	6:00 PM		5	0		1	10								1	0		**17**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	**2**
4:15 PM	4:30 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	**4**
4:30 PM	4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	**3**
5:00 PM	5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	**2**
5:15 PM	5:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	**3**
5:30 PM	5:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	3	0	0	1	6	0	0	0	0	0	0	0	0	0	**10**
4:15 PM	5:15 PM	0	0	3	0	0	1	5	0	0	0	0	0	0	1	0	0	**10**
4:30 PM	5:30 PM	0	0	2	0	0	1	5	0	0	0	0	0	0	1	0	0	**9**
4:45 PM	5:45 PM	0	0	3	0	0	1	5	0	0	0	0	0	0	1	0	0	**10**
5:00 PM	6:00 PM	0	0	2	0	0	1	4	0	0	0	0	0	0	1	0	0	**7**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

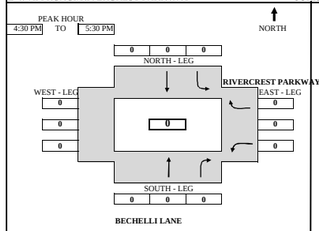
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	2	2	6	6	0	1	1	0	9
TRUCK PERCENTAGE	0.6%	0.6%	1.2%	1.2%	0.0%	1.7%	2.4%	0.0%	1.0%

B.A.Y.M.E.T.R.I.C.S.

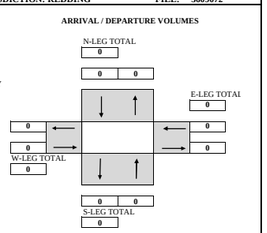
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:15 PM	5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:30 PM	5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	**2**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:15 PM	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

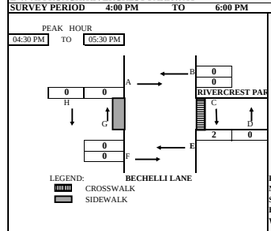
4:30 PM to 5:30 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH	0	0	0	0	**0**
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

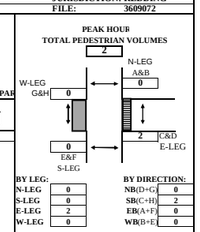
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: BECHELLI LANE — **DAY:** WEDNESDAY
E-W APPROACH: RIVERCREST PARKWAY — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 4:30 PM to 05:30 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



TIME PERIOD		NORTH X-WALK	EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	1	0	0	0	0	0	***1***
04:30 PM	04:45 PM	0	0	1	0	0	0	0	0	***1***
04:45 PM	05:00 PM	0	0	1	0	0	0	0	0	***1***
05:00 PM	05:15 PM	0	0	2	0	0	0	0	0	***2***
05:15 PM	05:30 PM	0	0	3	0	0	0	0	0	***3***
05:30 PM	05:45 PM	0	0	3	0	0	0	0	0	***3***
05:45 PM	06:00 PM	0	0	3	0	0	0	0	0	***3***
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	1	0	0	0	0	0	***1***
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	05:15 PM	0	0	1	0	0	0	0	0	***1***
05:15 PM	05:30 PM	0	0	1	0	0	0	0	0	***1***
05:30 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	05:00 PM	0	0	1	0	0	0	0	0	***1***
04:15 PM	05:15 PM	0	0	2	0	0	0	0	0	***2***
04:30 PM	05:30 PM	0	0	2	0	0	0	0	0	***2***
04:45 PM	05:45 PM	0	0	2	0	0	0	0	0	***2***
05:00 PM	06:00 PM	0	0	2	0	0	0	0	0	***2***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

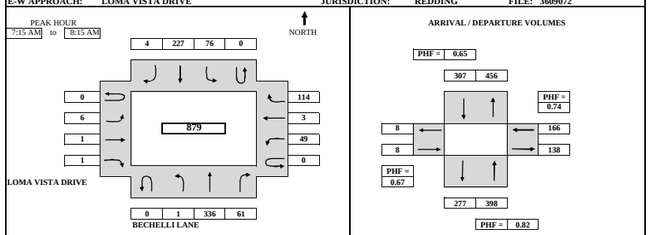
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	2	0	0	**2**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	2	0	**2**

BY LEG:		BY DIRECTION:	
N-LEG	0	NB(D+G)	0
S-LEG	0	SB(C+H)	2
E-LEG	2	EB(A+F)	0
W-LEG	0	WB(B+E)	0

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0	44	8		10	31	2		3	1	1		7	0	16	**123**
7:15 AM	7:30 AM		0	124	23		24	62	4		4	1	1		19	2	43	**307**
7:30 AM	7:45 AM		0	227	42		54	150	4		5	1	2		38	3	79	**605**
7:45 AM	8:00 AM		1	316	61		74	208	5		7	1	2		48	3	110	**836**
8:00 AM	8:15 AM		1	380	69		86	258	6		9	2	2		56	3	130	**1002**
8:15 AM	8:30 AM		1	465	80		93	295	6		13	2	2		62	3	150	**1172**
8:30 AM	8:45 AM		1	533	82		100	339	7		14	3	2		71	3	158	**1313**
8:45 AM	9:00 AM		1	625	87		107	382	8		14	4	3		81	4	164	**1480**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	44	8	0	10	31	2	0	3	1	1	0	7	0	16	**123**
7:15 AM	7:30 AM	0	0	80	15	0	14	31	2	0	1	0	0	0	12	2	27	**184**
7:30 AM	7:45 AM	0	0	103	19	0	30	88	0	0	1	0	1	0	19	1	36	**298**
7:45 AM	8:00 AM	0	1	89	19	0	20	58	1	0	2	0	0	0	10	0	31	**231**
8:00 AM	8:15 AM	0	0	64	8	0	12	50	1	0	2	1	0	0	8	0	20	**166**
8:15 AM	8:30 AM	0	0	85	11	0	7	37	0	0	4	0	0	0	6	0	20	**170**
8:30 AM	8:45 AM	0	0	68	2	0	7	44	1	0	1	1	0	0	9	0	8	**141**
8:45 AM	9:00 AM	0	0	92	5	0	7	43	1	0	0	1	1	0	10	1	6	**167**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	1	316	61	0	74	208	5	0	7	1	2	0	48	3	110	**836**
7:15 AM	8:15 AM	0	1	336	61	0	76	227	4	0	6	1	1	0	49	3	114	**879**
7:30 AM	8:30 AM	0	1	341	57	0	69	233	2	0	9	1	1	0	43	1	107	**865**
7:45 AM	8:45 AM	0	1	306	40	0	46	189	3	0	9	2	0	0	33	0	79	**708**
8:00 AM	9:00 AM	0	0	309	26	0	33	174	3	0	7	3	1	0	33	1	54	**644**

PEAK HOUR SUMMARY

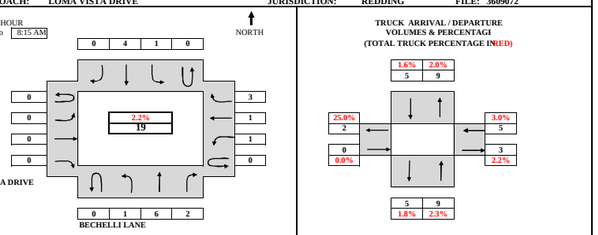
7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	1	336	61	0	76	227	4	0	6	1	1	0	49	3	114	**879**
PHF BY MOVEMENT	0.00	0.25	0.82	0.80	0.00	0.63	0.64	0.50	0.00	0.75	0.25	0.25	0.00	0.64	0.38	0.79	OVERALL
PHF BY APPROACH			0.82				0.65				0.67				0.74		0.74
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	9		9		5		5		0		3		5		2		**19**
TRUCK PERCENTAGE	2.3%		2.0%		1.6%		1.8%		0.0%		2.2%		3.0%		25.0%		**2.2%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				0				**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0	2	0		0	1	2		0	0	1		0	0	0	**6**
7:15 AM	7:30 AM		0	4	1		0	2	2		0	0	1		1	0	1	**12**
7:30 AM	7:45 AM		0	5	2		0	3	2		0	0	1		1	1	3	**18**
7:45 AM	8:00 AM		1	7	2		1	5	2		0	0	1		1	1	3	**24**
8:00 AM	8:15 AM		1	8	2		1	5	2		0	0	1		1	1	3	**25**
8:15 AM	8:30 AM		1	11	4		1	7	2		0	0	1		4	1	3	**35**
8:30 AM	8:45 AM		1	13	4		1	10	3		0	0	1		4	1	5	**43**
8:45 AM	9:00 AM		1	17	4		2	13	3		0	0	1		4	1	5	**51**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	2	0	0	0	1	2	0	0	0	1	0	0	0	0	**6**
7:15 AM	7:30 AM	0	0	2	1	0	0	1	0	0	0	0	0	0	1	0	1	**6**
7:30 AM	7:45 AM	0	0	1	1	0	0	1	0	0	0	0	0	0	1	2	6	**6**
7:45 AM	8:00 AM	0	1	2	0	0	1	2	0	0	0	0	0	0	0	0	0	**6**
8:00 AM	8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
8:15 AM	8:30 AM	0	0	3	2	0	0	2	0	0	0	0	0	0	3	0	0	**10**
8:30 AM	8:45 AM	0	0	2	0	0	0	3	1	0	0	0	0	0	0	0	2	**8**
8:45 AM	9:00 AM	0	0	4	0	0	1	3	0	0	0	0	0	0	0	0	0	**8**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	1	7	2	0	1	5	2	0	0	0	1	0	1	1	3	**24**
7:15 AM	8:15 AM	0	1	6	2	0	1	4	0	0	0	0	0	0	1	1	3	**19**
7:30 AM	8:30 AM	0	1	7	3	0	1	5	0	0	0	0	0	0	3	1	2	**23**
7:45 AM	8:45 AM	0	1	8	2	0	1	7	1	0	0	0	0	0	3	0	2	**25**
8:00 AM	9:00 AM	0	0	10	2	0	1	8	1	0	0	0	0	0	3	0	2	**27**

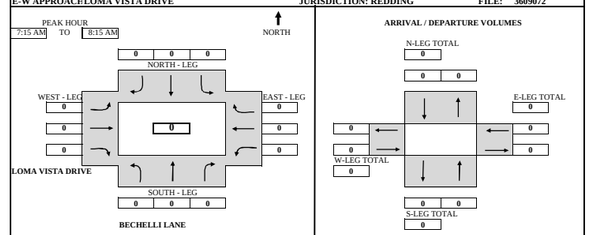
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	9	9	5	5	0	3	5	2	19
TRUCK PERCENTAGE	2.3%	2.0%	1.6%	1.8%	0.0%	2.2%	3.0%	25.0%	2.2%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:30 AM	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:30 AM	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:45 AM	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**

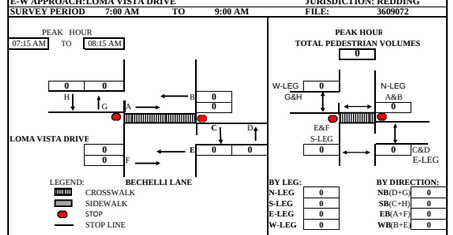
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH	0	0	0	0	**0**
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: BECHELLI LANE — **DAY:** WEDNESDAY
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM **TO** 9:00 AM — **FILE:** 3609072



TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	2	2	0	0	1	0	***5***
07:15 AM	--- 07:30 AM	0	0	2	2	0	0	1	0	***5***
07:30 AM	--- 07:45 AM	0	0	2	2	0	0	1	0	***5***
07:45 AM	--- 08:00 AM	0	0	2	2	0	0	1	0	***5***
08:00 AM	--- 08:15 AM	0	0	2	2	0	0	1	0	***5***
08:15 AM	--- 08:30 AM	2	0	2	2	0	0	1	0	***7***
08:30 AM	--- 08:45 AM	2	0	2	2	0	0	1	0	***7***
08:45 AM	--- 09:00 AM	2	0	2	2	0	0	1	0	***8***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	2	2	0	0	1	0	***5***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	2	0	0	0	0	0	0	0	***2***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	1	0	0	0	0	0	0	***1***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	2	2	0	0	1	0	***5***
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 08:30 AM	2	0	0	0	0	0	0	0	***2***
07:45 AM	--- 08:45 AM	2	0	0	0	0	0	0	0	***2***
08:00 AM	--- 09:00 AM	2	1	0	0	0	0	0	0	***3***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

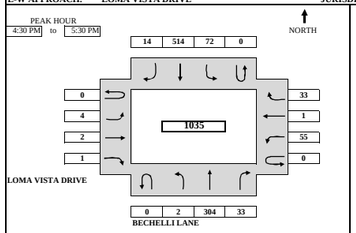
7:15 AM to 8:15 AM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION					
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

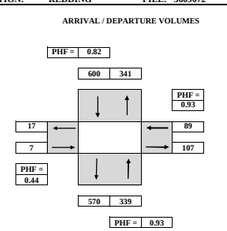
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM	2	1	70	4	0	9	105	1	0	3	0	1	0	9	0	6	**211**
4:15 PM	4:30 PM	2	3	132	12	0	20	134	2	0	5	1	2	0	17	0	17	**347**
4:30 PM	4:45 PM	2	3	204	19	0	41	265	5	0	6	1	2	0	31	0	27	**606**
4:45 PM	5:00 PM	2	3	277	29	0	54	367	12	0	6	1	3	0	43	0	32	**829**
5:00 PM	5:15 PM	2	5	358	37	0	69	533	14	0	8	3	3	0	57	0	42	**1131**
5:15 PM	5:30 PM	2	5	436	45	0	92	648	16	0	9	3	3	0	72	1	50	**1382**
5:30 PM	5:45 PM	2	8	502	50	0	99	744	21	0	13	4	7	0	81	1	57	**1589**
5:45 PM	6:00 PM	2	8	558	54	0	113	818	22	0	15	5	7	0	94	1	70	**1767**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	2	1	70	4	0	9	105	1	0	3	0	1	0	9	0	6	**211**
4:15 PM	4:30 PM	0	2	62	8	0	11	29	1	0	2	1	1	0	8	0	11	**136**
4:30 PM	4:45 PM	0	0	72	7	0	21	131	3	0	1	0	0	0	14	0	10	**259**
4:45 PM	5:00 PM	0	0	73	10	0	13	102	7	0	0	0	1	0	12	0	5	**223**
5:00 PM	5:15 PM	0	2	81	8	0	15	166	2	0	2	2	0	0	14	0	10	**302**
5:15 PM	5:30 PM	0	0	78	8	0	23	115	2	0	1	0	0	0	15	1	8	**251**
5:30 PM	5:45 PM	0	3	66	5	0	7	96	5	0	4	1	4	0	9	0	7	**207**
5:45 PM	6:00 PM	0	0	56	4	0	14	74	1	0	2	1	0	0	13	0	13	**178**
HOURLY TOTALS																		
4:00 PM	5:00 PM	2	3	277	29	0	54	367	12	0	6	1	3	0	43	0	32	**829**
4:15 PM	5:15 PM	0	4	288	33	0	60	428	13	0	5	3	2	0	48	0	36	**920**
4:30 PM	5:30 PM	0	2	304	33	0	72	514	14	0	4	2	1	0	55	1	33	**1035**
4:45 PM	5:45 PM	0	5	298	31	0	58	479	16	0	7	3	5	0	50	1	30	**983**
5:00 PM	6:00 PM	0	5	281	25	0	59	451	10	0	8	4	4	0	51	1	38	**938**

PEAK HOUR SUMMARY

4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	2	304	33	0	72	514	14	0	4	2	1	0	55	1	33	**1035**
PHF BY MOVEMENT	0.00	0.25	0.94	0.83	0.00	0.78	0.77	0.50	0.00	0.50	0.25	0.25	0.00	0.92	0.25	0.83	OVERALL
PHF BY APPROACH	0.93				0.82				0.44				0.93				0.86
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	3		3		6		4		0		4		2		0		**11**
TRUCK PERCENTAGE	0.9%		0.9%		1.0%		0.7%		0.0%		3.7%		2.2%		0.0%		**1.1%**
BICYCLE	0				1				0				0				**1**
PEDESTRIAN BY DIR:	2				2				0				2				**6**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	2				0				2				2				**6**

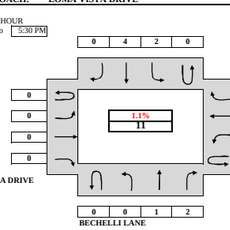
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

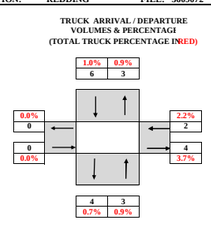
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM	0	0	0		0	2	0		0	0	0		0	0	0		**2**
4:15 PM	4:30 PM	0	0	0		0	4	0		1	0	1		0	0	0		**6**
4:30 PM	4:45 PM	0	0	1		0	5	0		1	0	1		0	0	1		**9**
4:45 PM	5:00 PM	0	0	1		2	5	0		1	0	1		0	0	1		**11**
5:00 PM	5:15 PM	0	1	2		2	6	0		1	0	1		0	0	2		**15**
5:15 PM	5:30 PM	0	1	2		2	8	0		1	0	1		0	0	2		**17**
5:30 PM	5:45 PM	0	2	2		2	9	0		1	0	1		0	0	3		**20**
5:45 PM	6:00 PM	0	3	2		3	10	0		1	0	1		0	0	4		**24**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	**2**
4:15 PM	4:30 PM	0	0	0	0	0	0	2	0	0	1	0	1	0	0	0	0	**4**
4:30 PM	4:45 PM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	**3**
4:45 PM	5:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	**2**
5:00 PM	5:15 PM	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	**4**
5:15 PM	5:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	**2**
5:30 PM	5:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	**3**
5:45 PM	6:00 PM	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	**4**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	0	1	0	2	5	0	0	1	0	1	0	0	0	1	**11**
4:15 PM	5:15 PM	0	0	1	2	0	2	4	0	0	1	0	1	0	0	0	2	**13**
4:30 PM	5:30 PM	0	0	1	2	0	2	4	0	0	0	0	0	0	0	0	2	**11**
4:45 PM	5:45 PM	0	0	2	1	0	2	4	0	0	0	0	0	0	0	0	2	**11**
5:00 PM	6:00 PM	0	0	3	1	0	3	5	0	0	0	0	0	0	0	0	3	**13**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

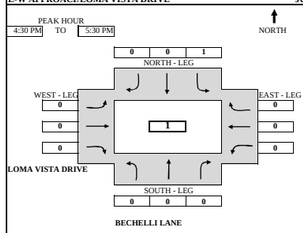
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	3	3	6	4	0	4	2	0	11
TRUCK PERCENTAGE	0.9%	0.9%	1.0%	0.7%	0.0%	3.7%	2.2%	0.0%	1.1%

B.A.Y.M.E.T.R.I.C.S.

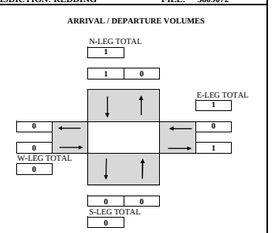
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: BECHELLI LANE — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 4:30 PM to 5:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:15 PM	5:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	**2**
5:30 PM	5:45 PM	0	0	0	2	1	0	0	0	0	0	0	0	**3**
5:45 PM	6:00 PM	0	1	0	2	1	0	0	0	0	0	0	0	**4**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	**1**
5:30 PM	5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:15 PM	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
4:30 PM	5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	**1**
4:45 PM	5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	**2**
5:00 PM	6:00 PM	0	1	0	2	0	0	0	0	0	0	0	0	**3**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

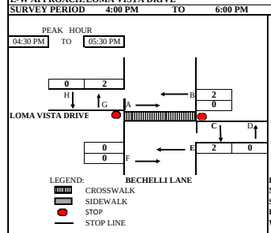
4:30 PM to 5:30 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH	0	1	0	0	**1**
BICYCLE	0	1	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

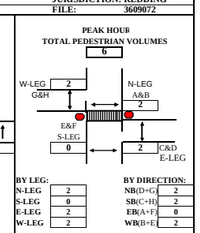
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: BECHELLI LANE — **DAY:** WEDNESDAY
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072

PEAK HOUR 4:30 PM TO 5:30 PM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:	
N-LEG	2
S-LEG	0
E-LEG	2
W-LEG	2

BY DIRECTION:	
NB(D+G)	2
SB(C+H)	2
EB(A+F)	0
WB(B+E)	2

TIME PERIOD		NORTH X-WALK	EAST X-WALK			SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
4:00 PM	4:15 PM	0	1	1	0	0	0	0	0	***2***
4:15 PM	4:30 PM	0	1	1	0	0	0	0	2	***4***
4:30 PM	4:45 PM	0	1	1	0	0	0	1	2	***5***
4:45 PM	5:00 PM	0	2	2	0	0	0	1	2	***7***
5:00 PM	5:15 PM	0	3	3	0	0	0	2	2	***10***
5:15 PM	5:30 PM	0	3	3	0	0	0	2	2	***10***
5:30 PM	5:45 PM	0	3	3	0	0	0	2	2	***10***
5:45 PM	6:00 PM	0	3	3	0	0	0	2	2	***10***
TOTAL BY PERIOD										
4:00 PM	4:15 PM	0	1	1	0	0	0	0	0	***2***
4:15 PM	4:30 PM	0	0	0	0	0	0	0	2	***2***
4:30 PM	4:45 PM	0	0	0	0	0	0	1	0	***1***
4:45 PM	5:00 PM	0	1	1	0	0	0	0	0	***2***
5:00 PM	5:15 PM	0	1	1	0	0	0	1	0	***3***
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	***0***
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	***0***
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
4:00 PM	5:00 PM	0	2	2	0	0	0	1	2	***7***
4:15 PM	5:15 PM	0	2	2	0	0	0	2	2	***8***
4:30 PM	5:30 PM	0	2	2	0	0	0	2	2	***6***
4:45 PM	5:45 PM	0	2	2	0	0	0	1	0	***5***
5:00 PM	6:00 PM	0	1	1	0	0	0	1	0	***3***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

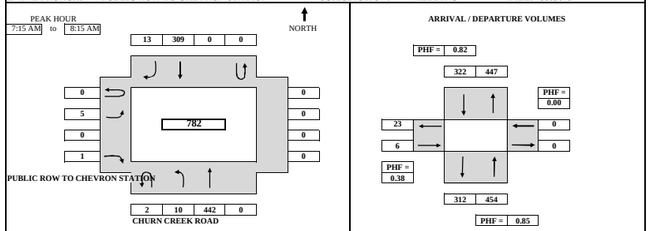
4:30 PM to 5:30 PM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	2	2	0	2	**6**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	2	0	2	2	**6**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES

TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM	0	0	97			55	1		1	0							**154**
7:15 AM	7:30 AM	0	1	229			129	5		30	2	0						**366**
7:30 AM	7:45 AM	0	4	339			222	10		5	1							**581**
7:45 AM	8:00 AM	2	8	453			294	10		6	1							**774**
8:00 AM	8:15 AM	2	10	539			364	14		6	1							**936**
8:15 AM	8:30 AM	4	13	654			419	16		7	1							**1114**
8:30 AM	8:45 AM	6	16	723			487	18		7	1							**1258**
8:45 AM	9:00 AM	6	17	787			553	18		8	1							**1390**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	97	0	0	0	55	1	0	1	0	0	0	0	0	0	**154**
7:15 AM	7:30 AM	0	1	132	0	0	0	74	4	0	1	0	0	0	0	0	0	**212**
7:30 AM	7:45 AM	0	3	110	0	0	0	93	5	0	3	0	1	0	0	0	0	**215**
7:45 AM	8:00 AM	2	4	114	0	0	0	72	0	0	1	0	0	0	0	0	0	**193**
8:00 AM	8:15 AM	0	2	86	0	0	0	70	4	0	0	0	0	0	0	0	0	**162**
8:15 AM	8:30 AM	2	3	115	0	0	0	55	2	0	1	0	0	0	0	0	0	**178**
8:30 AM	8:45 AM	2	3	69	0	0	0	68	2	0	0	0	0	0	0	0	0	**144**
8:45 AM	9:00 AM	0	1	64	0	0	0	66	0	0	1	0	0	0	0	0	0	**132**
HOURLY TOTALS																		
7:00 AM	8:00 AM	2	8	453	0	0	0	294	10	0	6	0	1	0	0	0	0	**774**
7:15 AM	8:15 AM	2	10	442	0	0	0	309	13	0	5	0	1	0	0	0	0	**782**
7:30 AM	8:30 AM	4	12	425	0	0	0	290	11	0	5	0	1	0	0	0	0	**748**
7:45 AM	8:45 AM	6	12	384	0	0	0	265	8	0	2	0	0	0	0	0	0	**677**
8:00 AM	9:00 AM	4	9	334	0	0	0	259	8	0	2	0	0	0	0	0	0	**616**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	2	10	442	0	0	0	309	13	0	5	0	1	0	0	0	0	**782**
PHF BY MOVEMENT	0.25	0.63	0.84	0.00	0.00	0.00	0.83	0.65	0.00	0.42	0.00	0.25	0.00	0.00	0.00	0.00	OVERALL
PHF BY APPROACH	0.85				0.82				0.38				0.00				0.91
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	8		8		3		3		0		0		0		0		**11**
TRUCK PERCENTAGE	1.8%		1.8%		0.9%		1.0%		0.0%		0.0%		0.0%		0.0%		**1.4%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	1				0				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				1				**1**

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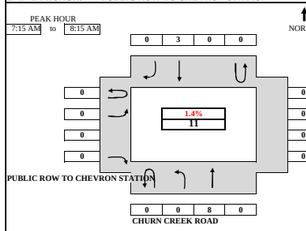
B.A.Y.M.E.T.R.I.C.S.

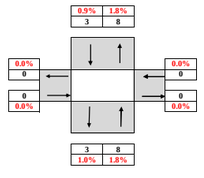
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE INCLUDED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM	0	1				2	0		1	0							**4**
7:15 AM	7:30 AM	0	3				3	0		1	0							**7**
7:30 AM	7:45 AM	0	5				3	0		1	0							**9**
7:45 AM	8:00 AM	0	9				4	0		1	0							**14**
8:00 AM	8:15 AM	0	9				5	0		1	0							**15**
8:15 AM	8:30 AM	0	11				5	0		1	0							**17**
8:30 AM	8:45 AM	0	12				9	0		1	0							**22**
8:45 AM	9:00 AM	0	14				10	0		2	0							**26**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	1	0	0	0	2	0	1	0	0	0	0	0	0	0	**4**
7:15 AM	7:30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	**3**
7:30 AM	7:45 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
7:45 AM	8:00 AM	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	**5**
8:00 AM	8:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
8:15 AM	8:30 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
8:30 AM	8:45 AM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	**5**
8:45 AM	9:00 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	**4**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	9	0	0	0	4	0	0	1	0	0	0	0	0	0	**14**
7:15 AM	8:15 AM	0	0	8	0	0	0	3	0	0	0	0	0	0	0	0	0	**11**
7:30 AM	8:30 AM	0	0	8	0	0	0	2	0	0	0	0	0	0	0	0	0	**10**
7:45 AM	8:45 AM	0	0	7	0	0	0	6	0	0	0	0	0	0	0	0	0	**13**
8:00 AM	9:00 AM	0	0	5	0	0	0	6	0	0	1	0	0	0	0	0	0	**12**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

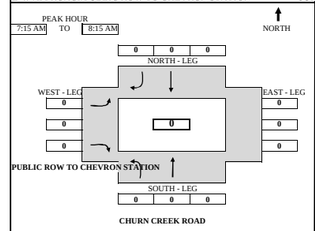
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	8	8	3	3	0	0	0	0	11
TRUCK PERCENTAGE	1.8%	1.8%	0.9%	1.0%	0.0%	0.0%	0.0%	0.0%	1.4%

B.A.Y.M.E.T.R.I.C.S.

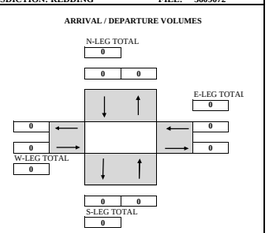
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM TO 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	**2**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	**2**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	**1**
8:00 AM	9:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	**2**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

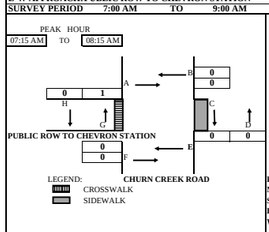
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

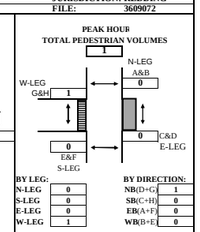
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** WEDNESDAY
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



PEDESTRIAN PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:	
N-LEG	0
S-LEG	0
E-LEG	0
W-LEG	1

BY DIRECTION:	
NB(D+G)	1
SB(C+H)	0
EB(A+F)	0
WB(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	08:00 AM	0	0	0	0	0	0	1	0	***1***
08:00 AM	08:15 AM	0	0	0	0	0	0	1	0	***1***
08:15 AM	08:30 AM	0	0	0	0	0	0	2	1	***3***
08:30 AM	08:45 AM	0	0	0	0	0	0	2	1	***3***
08:45 AM	09:00 AM	0	0	0	0	0	0	2	1	***3***
TOTAL BY PERIOD										
07:00 AM	07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	08:00 AM	0	0	0	0	0	0	1	0	***1***
08:00 AM	08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	08:30 AM	0	0	0	0	0	0	1	1	***2***
08:30 AM	08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	08:00 AM	0	0	0	0	0	0	1	0	***1***
07:15 AM	08:15 AM	0	0	0	0	0	0	1	0	***1***
07:30 AM	08:30 AM	0	0	0	0	0	0	2	1	***3***
07:45 AM	08:45 AM	0	0	0	0	0	0	2	1	***3***
08:00 AM	09:00 AM	0	0	0	0	0	0	2	1	***3***

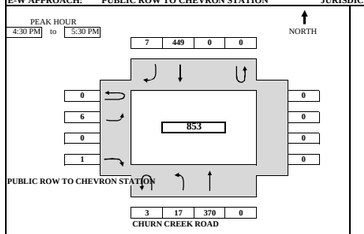
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

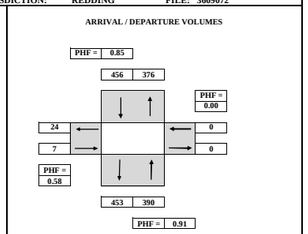
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	1	0	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	1	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM	2	1	65			102	2			0	0						**172**
4:15 PM	4:30 PM	7	4	154			207	6			1	0						**379**
4:30 PM	4:45 PM	9	8	239			305	6			2	0						**569**
4:45 PM	5:00 PM	9	11	343			416	8			4	0						**791**
5:00 PM	5:15 PM	9	17	431			549	9			6	1						**1022**
5:15 PM	5:30 PM	10	21	524			656	13			7	1						**1232**
5:30 PM	5:45 PM	11	22	591			745	15			8	1						**1393**
5:45 PM	6:00 PM	13	26	669			837	18			10	1						**1574**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	2	1	65	0	0	0	102	2	0	0	0	0	0	0	0	0	**172**
4:15 PM	4:30 PM	5	3	89	0	0	0	105	4	0	1	0	0	0	0	0	0	**207**
4:30 PM	4:45 PM	2	4	85	0	0	0	98	0	0	1	0	0	0	0	0	0	**190**
4:45 PM	5:00 PM	0	3	104	0	0	0	111	2	0	2	0	0	0	0	0	0	**222**
5:00 PM	5:15 PM	0	6	88	0	0	0	133	1	0	2	0	1	0	0	0	0	**231**
5:15 PM	5:30 PM	1	4	93	0	0	0	107	4	0	1	0	0	0	0	0	0	**210**
5:30 PM	5:45 PM	1	1	67	0	0	0	89	2	0	1	0	0	0	0	0	0	**161**
5:45 PM	6:00 PM	2	4	78	0	0	0	92	3	0	2	0	0	0	0	0	0	**181**
HOURLY TOTALS																		
4:00 PM	5:00 PM	9	11	343	0	0	0	416	8	0	4	0	0	0	0	0	0	**791**
4:15 PM	5:15 PM	7	16	366	0	0	0	447	7	0	6	0	1	0	0	0	0	**850**
4:30 PM	5:30 PM	3	17	370	0	0	0	449	7	0	6	0	1	0	0	0	0	**853**
4:45 PM	5:45 PM	2	14	352	0	0	0	440	9	0	6	0	1	0	0	0	0	**824**
5:00 PM	6:00 PM	4	15	326	0	0	0	421	10	0	6	0	1	0	0	0	0	**783**

PEAK HOUR SUMMARY

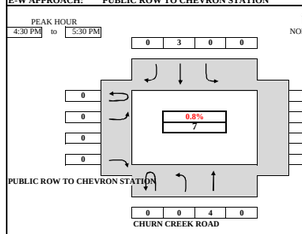
4:30 PM to 5:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	3	17	370	0	0	0	449	7	0	6	0	1	0	0	0	0	**853**
PHF BY MOVEMENT	0.38	0.71	0.89	0.00	0.00	0.00	0.84	0.44	0.00	0.75	0.00	0.25	0.00	0.00	0.00	0.00	OVERALL
PHF BY APPROACH	0.91				0.85				0.58				0.00				0.92
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	4		4		3		3		0		0		0		0		**7**
TRUCK PERCENTAGE	1.0%		1.1%		0.7%		0.7%		0.0%		0.0%		0.0%		0.0%		**0.8%**
BICYCLE	0				0				1				0				**1**
PEDESTRIAN BY DIR:	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				0				**0**

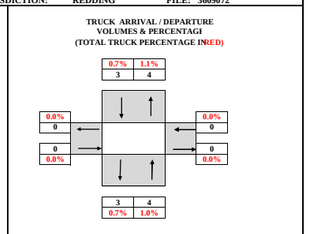
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM	0	0				1	0		0	0							**1**
4:15 PM	4:30 PM	0	3				3	0		0	0							**6**
4:30 PM	4:45 PM	0	3				4	0		0	0							**7**
4:45 PM	5:00 PM	0	5				6	0		0	0							**11**
5:00 PM	5:15 PM	0	5				6	0		0	0							**11**
5:15 PM	5:30 PM	0	7				6	0		0	0							**13**
5:30 PM	5:45 PM	0	7				6	0		0	0							**13**
5:45 PM	6:00 PM	0	7				7	0		0	0							**14**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
4:15 PM	4:30 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	**5**
4:30 PM	4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
4:45 PM	5:00 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	**4**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0	**11**
4:15 PM	5:15 PM	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	**10**
4:30 PM	5:30 PM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	**7**
4:45 PM	5:45 PM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	**6**
5:00 PM	6:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	**3**

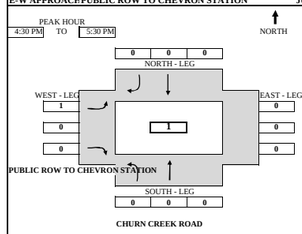
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

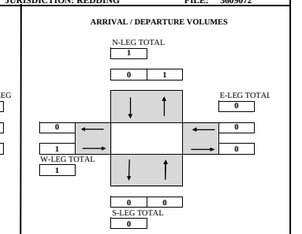
4:30 PM to 5:30 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	4	4	3	3	0	0	0	0	**7**
TRUCK PERCENTAGE	1.0%	1.1%	0.7%	0.7%	0.0%	0.0%	0.0%	0.0%	0.8%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:15 PM	5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:30 PM	5:45 PM	0	0	0	0	1	0	1	0	0	0	0	0	**2**
5:45 PM	6:00 PM	0	0	0	0	1	0	1	0	0	0	0	0	**2**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:15 PM	5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:30 PM	5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:45 PM	5:45 PM	0	0	0	0	1	0	1	0	0	0	0	0	**2**
5:00 PM	6:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**

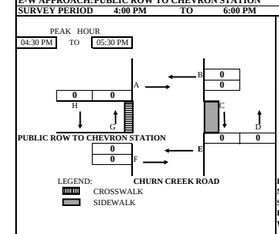
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

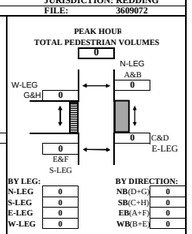
4:30 PM to 5:30 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH	0	0	1	0	**1**
BICYCLE	0	0	1	0	**1**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** WEDNESDAY
E-W APPROACH: PUBLIC ROW TO CHEVRON STATION — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK	EAST X-WALK			SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	3	0	***3***
04:15 PM	04:30 PM	0	0	0	0	0	0	3	0	***3***
04:30 PM	04:45 PM	0	0	0	0	0	0	3	0	***3***
04:45 PM	05:00 PM	0	0	0	0	0	0	3	0	***3***
05:00 PM	05:15 PM	0	0	0	0	0	0	3	0	***3***
05:15 PM	05:30 PM	0	0	0	0	0	0	3	0	***3***
05:30 PM	05:45 PM	0	0	0	0	0	0	3	0	***3***
05:45 PM	06:00 PM	0	0	0	0	0	0	3	0	***3***
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	3	0	***3***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	05:00 PM	0	0	0	0	0	0	3	0	***3***
04:15 PM	05:15 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	06:00 PM	0	0	0	0	0	0	0	0	***0***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

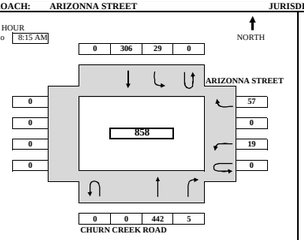
4:30 PM to 5:30 PM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION	0	0	0	0	**0**
PEDESTRIAN	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
VOLUME BY LEG	0	0	0	0	**0**
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

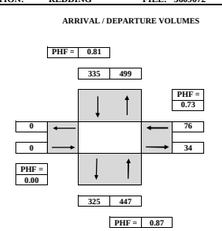
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM			96	0		2	55							3	12		**168**
7:15 AM	7:30 AM			224	0		6	131							4	27		**392**
7:30 AM	7:45 AM			336	2		15	226							12	44		**635**
7:45 AM	8:00 AM			451	4		18	289							19	63		**844**
8:00 AM	8:15 AM			538	5		31	361							22	69		**1026**
8:15 AM	8:30 AM			647	7		38	416							22	77		**1207**
8:30 AM	8:45 AM			717	8		43	485							22	81		**1356**
8:45 AM	9:00 AM			778	9		47	547							24	83		**1488**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	96	0	0	2	55	0	0	0	0	0	0	3	0	12	**168**
7:15 AM	7:30 AM	0	0	128	0	0	4	76	0	0	0	0	0	0	1	0	15	**224**
7:30 AM	7:45 AM	0	0	112	2	0	9	95	0	0	0	0	0	0	8	0	17	**243**
7:45 AM	8:00 AM	0	0	115	2	0	3	63	0	0	0	0	0	0	7	0	19	**209**
8:00 AM	8:15 AM	0	0	87	1	0	13	72	0	0	0	0	0	0	3	0	6	**182**
8:15 AM	8:30 AM	0	0	109	2	0	7	55	0	0	0	0	0	0	0	0	8	**181**
8:30 AM	8:45 AM	0	0	70	1	0	5	69	0	0	0	0	0	0	0	0	4	**149**
8:45 AM	9:00 AM	0	0	61	1	0	4	62	0	0	0	0	0	0	2	0	2	**132**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	451	4	0	18	289	0	0	0	0	0	0	19	0	63	**844**
7:15 AM	8:15 AM	0	0	442	5	0	29	306	0	0	0	0	0	0	19	0	57	**858**
7:30 AM	8:30 AM	0	0	423	7	0	32	285	0	0	0	0	0	0	18	0	50	**815**
7:45 AM	8:45 AM	0	0	381	6	0	28	259	0	0	0	0	0	0	10	0	37	**721**
8:00 AM	9:00 AM	0	0	327	5	0	29	258	0	0	0	0	0	0	5	0	20	**644**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	442	5	0	29	306	0	0	0	0	0	0	19	0	57	**858**
PHF BY MOVEMENT	0.00	0.00	0.86	0.63	0.00	0.56	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00	0.75	OVERALL
PHF BY APPROACH			0.87				0.81				0.00				0.73		0.88
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	17		17		11		11		0		2		2		0		**30**
TRUCK PERCENTAGE	3.8%		3.4%		3.3%		3.4%		0.0%		5.9%		2.6%		0.0%		**3.5%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				0				**0**

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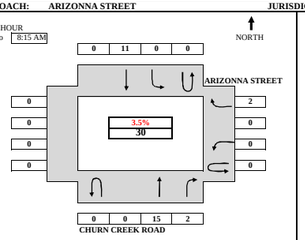
B.A.Y.M.E.T.R.I.C.S.

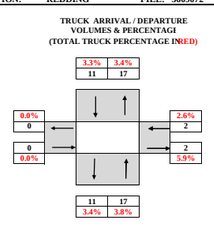
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGI (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM			3	0		0	2							0	1		**6**
7:15 AM	7:30 AM			5	0		0	5							0	1		**11**
7:30 AM	7:45 AM			9	0		0	5							0	1		**15**
7:45 AM	8:00 AM			15	1		0	10							0	2		**28**
8:00 AM	8:15 AM			18	2		0	13							0	3		**36**
8:15 AM	8:30 AM			21	3		0	14							0	3		**41**
8:30 AM	8:45 AM			24	4		0	20							0	4		**52**
8:45 AM	9:00 AM			29	4		0	22							0	4		**59**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	1	**6**
7:15 AM	7:30 AM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	**5**
7:30 AM	7:45 AM	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
7:45 AM	8:00 AM	0	0	6	1	0	0	5	0	0	0	0	0	0	0	0	1	**13**
8:00 AM	8:15 AM	0	0	3	1	0	0	3	0	0	0	0	0	0	0	0	1	**8**
8:15 AM	8:30 AM	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	**5**
8:30 AM	8:45 AM	0	0	3	1	0	0	6	0	0	0	0	0	0	0	0	1	**11**
8:45 AM	9:00 AM	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	**7**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	15	1	0	0	10	0	0	0	0	0	0	0	0	2	**28**
7:15 AM	8:15 AM	0	0	15	2	0	0	11	0	0	0	0	0	0	0	0	2	**30**
7:30 AM	8:30 AM	0	0	16	3	0	0	9	0	0	0	0	0	0	0	0	2	**30**
7:45 AM	8:45 AM	0	0	15	4	0	0	15	0	0	0	0	0	0	0	0	3	**37**
8:00 AM	9:00 AM	0	0	14	3	0	0	12	0	0	0	0	0	0	0	0	2	**31**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

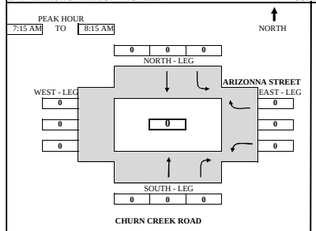
7:15 AM to 8:15 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	17	17	11	11	0	2	2	0	**30**
TRUCK PERCENTAGE	3.8%	3.4%	3.3%	3.4%	0.0%	5.9%	2.6%	0.0%	**3.5%**

B.A.Y.M.E.T.R.I.C.S.

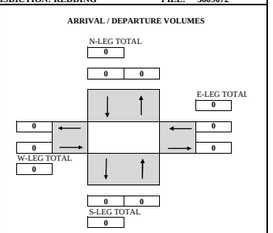
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING — **FILE:** 3609072

PEAK HOUR 7:15 AM to 8:15 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
8:30 AM	8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	**2**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
8:30 AM	8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	**2**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
7:45 AM	8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
8:00 AM	9:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	**2**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

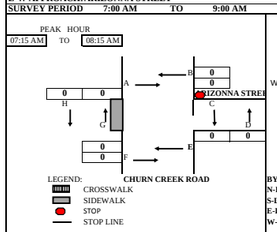
7:15 AM to 8:15 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

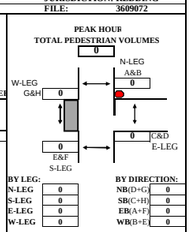
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** WEDNESDAY
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM TO 9:00 AM — **FILE:** 3609072

PEAK HOUR 07:15 AM TO 08:15 AM



PEAK HOUR TOTAL PEDESTRIAN VOLUMES



BY LEG:	
N-LEG	0
S-LEG	0
E-LEG	0
W-LEG	0

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	0
EB(A+F)	0
WB(B+E)	0

TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	--- 08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	--- 08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	--- 08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	--- 09:00 AM	0	0	0	0	0	0	0	0	***0***

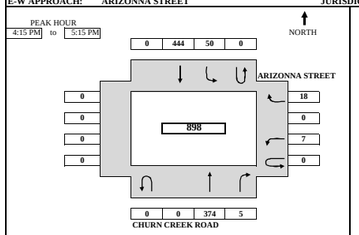
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

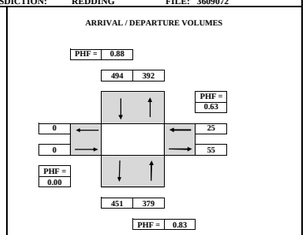
7:15 AM to 8:15 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		64	1		0	7	106							3	9		**190**
4:15 PM	4:30 PM		150	2		0	2	212							4	13		**402**
4:30 PM	4:45 PM		236	4		0	39	306							6	15		**606**
4:45 PM	5:00 PM		348	6		0	45	422							9	22		**852**
5:00 PM	5:15 PM		438	6		0	57	550							10	27		**1088**
5:15 PM	5:30 PM		517	12		0	67	655							13	32		**1296**
5:30 PM	5:45 PM		585	13		2	85	755							14	47		**1501**
5:45 PM	6:00 PM		660	15		2	91	842							15	55		**1680**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	64	1	0	7	106	0	0	0	0	0	0	3	0	9	**190**
4:15 PM	4:30 PM	0	0	86	1	0	14	106	0	0	0	0	0	0	1	0	4	**212**
4:30 PM	4:45 PM	0	0	86	2	0	18	94	0	0	0	0	0	0	2	0	2	**204**
4:45 PM	5:00 PM	0	0	112	2	0	6	116	0	0	0	0	0	0	3	0	7	**246**
5:00 PM	5:15 PM	0	0	90	0	0	12	128	0	0	0	0	0	0	1	0	5	**236**
5:15 PM	5:30 PM	0	0	79	6	0	10	105	0	0	0	0	0	0	3	0	5	**208**
5:30 PM	5:45 PM	0	0	68	1	2	18	100	0	0	0	0	0	0	1	0	15	**205**
5:45 PM	6:00 PM	0	0	75	2	0	6	87	0	0	0	0	0	0	1	0	8	**179**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	348	6	0	45	422	0	0	0	0	0	0	9	0	22	**852**
4:15 PM	5:15 PM	0	0	374	5	0	50	444	0	0	0	0	0	0	7	0	18	**898**
4:30 PM	5:30 PM	0	0	367	10	0	46	443	0	0	0	0	0	0	9	0	19	**894**
4:45 PM	5:45 PM	0	0	349	9	2	46	449	0	0	0	0	0	0	8	0	32	**895**
5:00 PM	6:00 PM	0	0	312	9	2	36	420	0	0	0	0	0	0	6	0	33	**828**

PEAK HOUR SUMMARY

4:15 PM to 5:15 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	374	5	0	50	444	0	0	0	0	0	0	7	0	18	**898**
PHF BY MOVEMENT	0.00	0.00	0.83	0.63	0.00	0.69	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.64	OVERALL
PHF BY APPROACH	0.83				0.91				0.00				0.63				0.91
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	11		11		9		9		0		0		0		0		**20**
TRUCK PERCENTAGE	2.9%		2.8%		1.8%		2.0%		0.0%		0.0%		0.0%		0.0%		**2.2%**
BICYCLE	1				1				0				1				**3**
PEDESTRIAN BY DIR:	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				0				0				0				**0**

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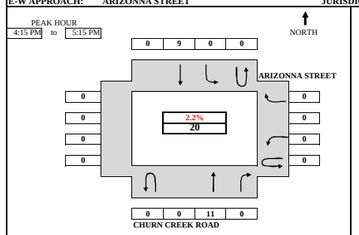
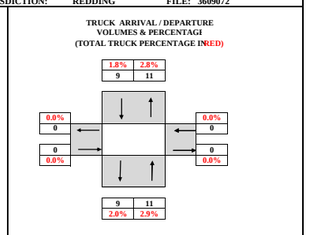
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0		0	3								0	0		**3**
4:15 PM	4:30 PM		3	0		0	7								0	0		**10**
4:30 PM	4:45 PM		4	0		0	8								0	0		**12**
4:45 PM	5:00 PM		9	0		0	11								0	0		**20**
5:00 PM	5:15 PM		11	0		0	12								0	0		**23**
5:15 PM	5:30 PM		17	1		0	13								0	0		**31**
5:30 PM	5:45 PM		19	1		0	14								0	1		**35**
5:45 PM	6:00 PM		19	1		0	17								0	1		**38**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	**3**
4:15 PM	4:30 PM	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0	**7**
4:30 PM	4:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
4:45 PM	5:00 PM	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	**8**
5:00 PM	5:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	**3**
5:15 PM	5:30 PM	0	0	6	1	0	0	1	0	0	0	0	0	0	0	0	0	**8**
5:30 PM	5:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	1	**4**
5:45 PM	6:00 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	**3**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	9	0	0	0	11	0	0	0	0	0	0	0	0	0	**20**
4:15 PM	5:15 PM	0	0	11	0	0	0	9	0	0	0	0	0	0	0	0	0	**20**
4:30 PM	5:30 PM	0	0	14	1	0	0	6	0	0	0	0	0	0	0	0	0	**21**
4:45 PM	5:45 PM	0	0	15	1	0	0	6	0	0	0	0	0	0	0	0	1	**23**
5:00 PM	6:00 PM	0	0	10	1	0	0	6	0	0	0	0	0	0	0	0	1	**18**

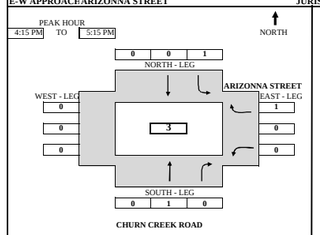
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

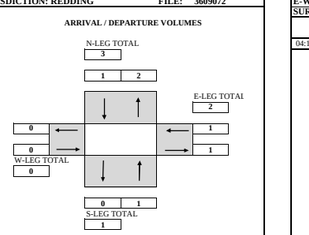
4:15 PM to 5:15 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	11	11	9	9	0	0	0	0	20
TRUCK PERCENTAGE	2.9%	2.8%	1.8%	2.0%	0.0%	0.0%	0.0%	0.0%	2.2%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	**1**
4:45 PM	5:00 PM	0	1	0	1	0	0	0	0	0	0	0	1	**3**
5:00 PM	5:15 PM	0	1	0	1	0	0	0	0	0	0	0	1	**3**
5:15 PM	5:30 PM	0	1	0	1	1	0	0	0	0	0	0	2	**5**
5:30 PM	5:45 PM	0	1	0	1	2	0	0	0	0	0	0	2	**6**
5:45 PM	6:00 PM	0	1	0	1	2	0	0	0	0	0	0	2	**6**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	**1**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	**2**
5:00 PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	5:30 PM	0	0	0	0	1	0	0	0	0	0	0	1	**2**
5:30 PM	5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	1	0	1	0	0	0	0	0	0	0	1	**3**
4:15 PM	5:15 PM	0	1	0	1	0	0	0	0	0	0	0	1	**3**
4:30 PM	5:30 PM	0	1	0	1	1	0	0	0	0	0	0	1	**4**
4:45 PM	5:45 PM	0	1	0	1	2	0	0	0	0	0	0	1	**5**
5:00 PM	6:00 PM	0	0	0	0	2	0	0	0	0	0	0	1	**3**

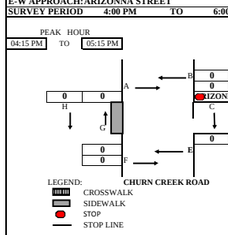
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

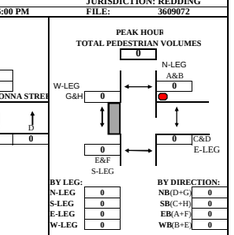
4:15 PM to 5:15 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH					
BICYCLE	1	1	0	1	**3**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** WEDNESDAY
E-W APPROACH: ARIZONNA STREET — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	06:00 PM	0	0	0	0	0	0	0	0	***0***
TOTAL BY PERIOD										
04:00 PM	04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	04:45 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	05:15 PM	0	0	0	0	0	0	0	0	***0***
05:15 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
05:30 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:45 PM	06:00 PM	0	0	0	0	0	0	0	0	***0***
HOURLY TOTALS										
04:00 PM	05:00 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	05:15 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	05:30 PM	0	0	0	0	0	0	0	0	***0***
04:45 PM	05:45 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	06:00 PM	0	0	0	0	0	0	0	0	***0***

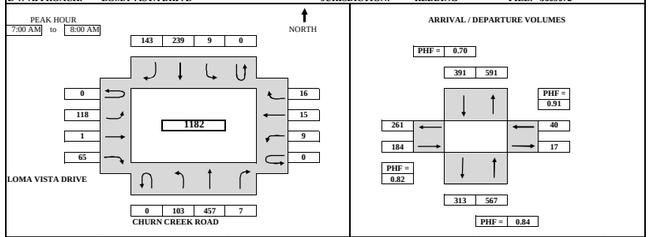
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

4:15 PM to 5:15 PM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION					
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		11	104	2	2	54	20		13	0	8		2	2	6		224
7:15 AM	7:30 AM		36	247	2	4	111	53		47	0	26		6	7	8		547
7:30 AM	7:45 AM		68	346	4	7	192	109		90	0	39		9	9	11		884
7:45 AM	8:00 AM		103	457	7	9	239	143		118	1	65		9	15	16		1182
8:00 AM	8:15 AM		116	540	8	13	295	159		141	2	81		13	15	21		1404
8:15 AM	8:30 AM		125	648	10	13	347	166		160	2	90		15	17	22		1615
8:30 AM	8:45 AM		129	724	11	14	406	180		165	3	96		18	18	23		1787
8:45 AM	9:00 AM		134	787	11	14	454	195		178	3	103		20	22	25		1946
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	11	104	2	0	2	54	20	0	13	0	8	0	2	2	6	224
7:15 AM	7:30 AM	0	25	143	0	0	2	57	33	0	34	0	18	0	4	5	2	323
7:30 AM	7:45 AM	0	32	99	2	0	3	81	56	0	43	0	13	0	3	2	3	337
7:45 AM	8:00 AM	0	35	111	3	0	2	47	34	0	28	1	26	0	0	6	5	298
8:00 AM	8:15 AM	0	13	83	1	0	4	56	16	0	23	1	16	0	4	0	5	222
8:15 AM	8:30 AM	0	9	108	2	0	0	52	7	0	19	0	9	0	2	2	1	211
8:30 AM	8:45 AM	0	4	76	1	0	1	59	14	0	5	1	6	0	3	1	1	172
8:45 AM	9:00 AM	0	5	63	0	0	0	48	15	0	13	0	7	0	2	4	2	159
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	103	457	7	0	9	239	143	0	118	1	65	0	9	15	16	1182
7:15 AM	8:15 AM	0	105	436	6	0	11	241	139	0	128	2	73	0	11	13	15	1180
7:30 AM	8:30 AM	0	89	401	8	0	9	236	113	0	113	2	64	0	9	10	14	1068
7:45 AM	8:45 AM	0	61	378	7	0	7	214	71	0	75	3	57	0	9	9	12	903
8:00 AM	9:00 AM	0	31	330	4	0	5	215	52	0	60	2	38	0	11	7	9	764

PEAK HOUR SUMMARY

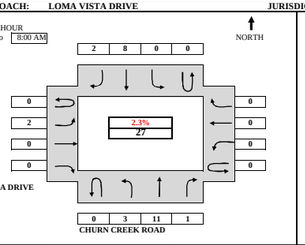
7:00 AM to 8:00 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	103	457	7	0	9	239	143	0	118	1	65	0	9	15	16	**1182**
PHF BY MOVEMENT	0.00	0.74	0.80	0.58	0.00	0.75	0.74	0.64	0.00	0.69	0.25	0.63	0.00	0.56	0.63	0.67	OVERALL
PHF BY APPROACH	0.84				0.70				0.82				0.91				0.88
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	15		13		10		8		2		1		0		5		**27**
TRUCK PERCENTAGE	2.6%		2.2%		2.6%		2.6%		1.1%		5.9%		0.0%		1.9%		**2.3%**
BICYCLE	0				0				0				0				**0**
PEDESTRIAN BY DIR:	3				6				1				6				**16**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				7				1				8				**16**

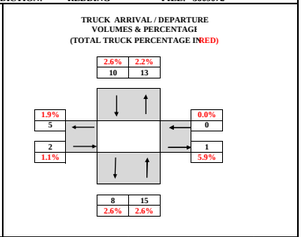
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		2	3	0	0	3	1		1	0	0		0	0	0		10
7:15 AM	7:30 AM		2	5	0	0	5	1		1	0	0		0	0	0		14
7:30 AM	7:45 AM		2	7	0	0	5	2		1	0	0		0	0	0		17
7:45 AM	8:00 AM		3	11	1	0	8	2		2	0	0		0	0	0		27
8:00 AM	8:15 AM		4	12	1	0	9	2		3	0	0		1	0	0		32
8:15 AM	8:30 AM		5	15	1	0	9	2		4	0	0		1	1	0		38
8:30 AM	8:45 AM		5	20	1	0	13	3		4	0	1		1	1	0		49
8:45 AM	9:00 AM		5	25	1	0	16	3		5	0	1		1	1	0		58
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	2	3	0	0	0	3	1	0	1	0	0	0	0	0	0	10
7:15 AM	7:30 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	4
7:30 AM	7:45 AM	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	3
7:45 AM	8:00 AM	0	1	4	1	0	0	3	0	0	1	0	0	0	0	0	0	10
8:00 AM	8:15 AM	0	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	5
8:15 AM	8:30 AM	0	1	3	0	0	0	0	0	0	1	0	0	0	0	1	0	6
8:30 AM	8:45 AM	0	0	5	0	0	0	4	1	0	0	0	1	0	0	0	0	11
8:45 AM	9:00 AM	0	0	5	0	0	0	3	0	0	1	0	0	0	0	0	0	9
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	3	11	1	0	0	8	2	0	2	0	0	0	0	0	0	27
7:15 AM	8:15 AM	0	2	9	1	0	0	6	1	0	2	0	0	0	1	0	0	22
7:30 AM	8:30 AM	0	3	10	1	0	0	4	1	0	3	0	0	0	1	1	0	24
7:45 AM	8:45 AM	0	3	13	1	0	0	8	1	0	3	0	1	0	1	1	0	32
8:00 AM	9:00 AM	0	2	14	0	0	0	8	1	0	3	0	1	0	1	1	0	31

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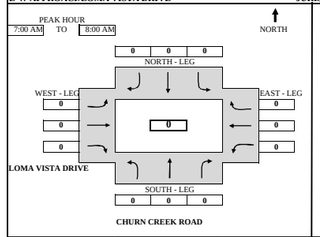
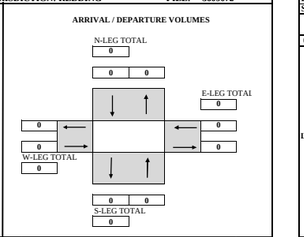
7:00 AM to 8:00 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	15	13	10	8	2	1	0	5	27
TRUCK PERCENTAGE	2.6%	2.2%	2.6%	2.6%	1.1%	5.9%	0.0%	1.9%	2.3%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 7:00 AM — **TO** 9:00 AM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
HOURLY TOTALS														
7:00 AM	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0

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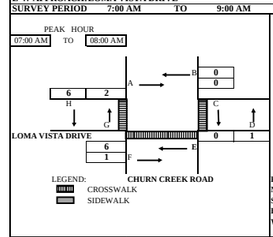
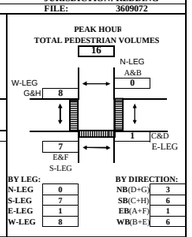
7:00 AM to 8:00 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** WEDNESDAY
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM **TO** 9:00 AM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK	EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	A	B	C	D	E	F	G	H	TOTAL
SURVEY DATA										
07:00 AM	07:15 AM	0	0	0	0	1	0	0	1	**2**
07:15 AM	07:30 AM	0	0	0	0	1	0	0	3	**4**
07:30 AM	07:45 AM	0	0	0	0	5	0	1	3	**9**
07:45 AM	08:00 AM	0	0	0	1	6	1	2	6	**16**
08:00 AM	08:15 AM	0	0	4	2	8	2	3	7	**26**
08:15 AM	08:30 AM	0	0	4	7	10	5	4	8	**38**
08:30 AM	08:45 AM	0	0	4	7	10	5	5	8	**39**
08:45 AM	09:00 AM	0	0	4	7	10	5	5	9	**40**
TOTAL BY PERIOD										
07:00 AM	07:15 AM	0	0	0	0	1	0	0	1	**2**
07:15 AM	07:30 AM	0	0	0	0	0	0	0	2	**2**
07:30 AM	07:45 AM	0	0	0	0	4	0	1	0	**5**
07:45 AM	08:00 AM	0	0	0	1	1	1	1	3	**7**
08:00 AM	08:15 AM	0	0	4	1	2	1	1	1	**10**
08:15 AM	08:30 AM	0	0	0	5	2	3	1	1	**12**
08:30 AM	08:45 AM	0	0	0	0	0	1	0	0	**1**
08:45 AM	09:00 AM	0	0	0	0	0	0	0	1	**1**
HOURLY TOTALS										
07:00 AM	08:00 AM	0	0	0	1	6	1	2	6	**16**
07:15 AM	08:15 AM	0	0	4	2	7	2	3	6	**24**
07:30 AM	08:30 AM	0	0	4	7	9	5	4	5	**34**
07:45 AM	08:45 AM	0	0	4	7	5	5	4	5	**30**
08:00 AM	09:00 AM	0	0	4	6	4	4	3	3	**24**

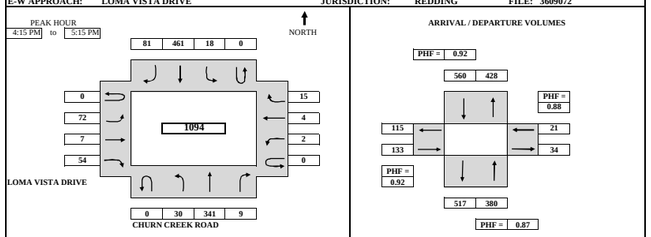
Tel : (510) 232-1271 *Fax: (510) 232-1272*

7:00 AM to 8:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	3	6	1	6	**16**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	7	1	8	**16**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		9	81	0	5	111	11		10	0	7		1	0	5		**240**
4:15 PM	4:30 PM		14	162	3	11	231	31		28	1	20		2	1	7		**511**
4:30 PM	4:45 PM		23	232	6	14	333	52		48	3	32		2	2	12		**759**
4:45 PM	5:00 PM		30	333	7	19	445	70		64	5	45		3	2	16		**1039**
5:00 PM	5:15 PM		39	422	9	23	572	92		82	7	61		3	4	20		**1334**
5:15 PM	5:30 PM		48	497	10	24	687	116		106	11	70		5	6	20		**1600**
5:30 PM	5:45 PM		51	577	12	27	790	136		121	13	83		7	8	23		**1848**
5:45 PM	6:00 PM		55	661	13	29	877	155		133	15	93		7	8	26		**2072**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	9	81	0	0	5	111	11	0	10	0	7	0	1	0	5	**240**
4:15 PM	4:30 PM	0	5	81	3	0	6	120	20	0	18	1	13	0	1	1	2	**271**
4:30 PM	4:45 PM	0	9	70	3	0	3	102	21	0	20	2	12	0	0	1	5	**248**
4:45 PM	5:00 PM	0	7	101	1	0	5	112	18	0	16	2	13	0	1	0	4	**280**
5:00 PM	5:15 PM	0	9	89	2	0	4	127	22	0	18	2	16	0	0	2	4	**295**
5:15 PM	5:30 PM	0	9	75	1	0	1	115	24	0	24	4	9	0	2	2	0	**266**
5:30 PM	5:45 PM	0	3	80	2	0	3	103	20	0	15	2	13	0	2	2	3	**248**
5:45 PM	6:00 PM	0	4	84	1	0	2	87	19	0	12	2	10	0	0	0	3	**224**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	30	333	7	0	19	445	70	0	64	5	45	0	3	2	16	**1039**
4:15 PM	5:15 PM	0	30	341	9	0	18	461	81	0	72	7	54	0	2	4	15	**1094**
4:30 PM	5:30 PM	0	34	335	7	0	13	456	85	0	78	10	50	0	3	5	13	**1089**
4:45 PM	5:45 PM	0	28	345	6	0	13	457	84	0	73	10	51	0	5	6	11	**1089**
5:00 PM	6:00 PM	0	25	328	6	0	10	432	85	0	69	10	48	0	4	6	10	**1033**

PEAK HOUR SUMMARY

4:15 PM to 5:15 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	30	341	9	0	18	461	81	0	72	7	54	0	2	4	15	**1094**
PHF BY MOVEMENT	0.00	0.83	0.84	0.75	0.00	0.75	0.91	0.92	0.00	0.90	0.88	0.84	0.00	0.50	0.50	0.75	OVERALL
PHF BY APPROACH	0.87				0.92				0.92				0.88				0.91
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	12		14		13		12		5		3		2		3		**32**
TRUCK PERCENTAGE	3.2%		3.3%		2.3%		2.3%		3.8%		8.8%		9.5%		2.6%		**2.9%**
BICYCLE	1				1				2				1				**5**
PEDESTRIAN BY DIR:	3				2				0				1				**6**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				1				1				4				**6**

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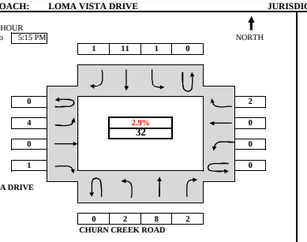
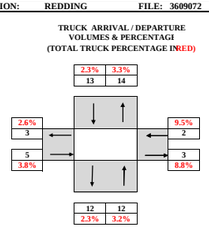
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	2	0		0	4	0		0	0	0		0	0	0	**6**
4:15 PM	4:30 PM		0	5	1		0	9	1		0	0	0		0	0	0	**16**
4:30 PM	4:45 PM		0	6	1		0	10	1		0	0	0		0	2	0	**20**
4:45 PM	5:00 PM		2	9	1		1	14	1		2	0	0		0	2	0	**32**
5:00 PM	5:15 PM		2	10	2		1	15	1		4	0	1		0	2	0	**38**
5:15 PM	5:30 PM		3	15	2		1	16	2		4	0	2		0	2	0	**47**
5:30 PM	5:45 PM		4	18	2		1	18	2		4	0	2		0	2	0	**53**
5:45 PM	6:00 PM		4	18	2		1	21	3		5	0	3		0	2	0	**59**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	**6**
4:15 PM	4:30 PM	0	0	3	1	0	0	5	1	0	0	0	0	0	0	0	0	**10**
4:30 PM	4:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	**4**
4:45 PM	5:00 PM	0	2	3	0	0	1	4	0	0	2	0	0	0	0	0	0	**12**
5:00 PM	5:15 PM	0	0	1	1	0	0	1	0	0	2	0	1	0	0	0	0	**6**
5:15 PM	5:30 PM	0	1	5	0	0	0	1	1	0	0	0	1	0	0	0	0	**9**
5:30 PM	5:45 PM	0	1	3	0	0	0	2	0	0	0	0	0	0	0	0	0	**6**
5:45 PM	6:00 PM	0	0	0	0	0	0	3	1	0	1	0	1	0	0	0	0	**6**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	2	9	1	0	1	14	1	0	2	0	0	0	0	0	2	**32**
4:15 PM	5:15 PM	0	2	8	2	0	1	11	1	0	4	0	1	0	0	0	2	**32**
4:30 PM	5:30 PM	0	3	10	1	0	1	7	1	0	4	0	2	0	0	0	2	**31**
4:45 PM	5:45 PM	0	4	12	1	0	1	8	1	0	4	0	2	0	0	0	0	**33**
5:00 PM	6:00 PM	0	2	9	1	0	0	7	2	0	3	0	3	0	0	0	0	**27**

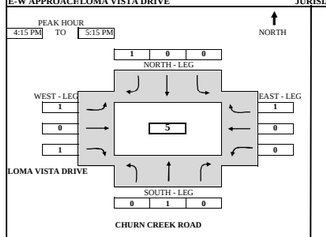
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

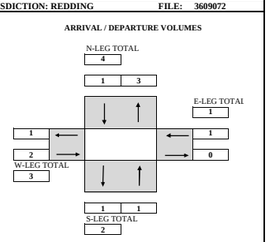
4:15 PM to 5:15 PM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	12	14	13	12	5	3	2	3	32
TRUCK PERCENTAGE	3.2%	3.3%	2.3%	2.3%	3.8%	8.8%	9.5%	2.6%	2.9%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	1	0	1	0	0	0	**2**
5:00 PM	5:15 PM	0	1	0	0	0	1	1	0	1	0	0	1	**5**
5:15 PM	5:30 PM	0	1	0	0	0	1	1	0	1	0	0	1	**5**
5:30 PM	5:45 PM	0	1	0	0	0	2	1	0	1	0	0	1	**9**
5:45 PM	6:00 PM	0	1	0	0	0	2	1	0	1	0	0	1	**9**
TOTAL BY PERIOD														
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	5:00 PM	0	0	0	0	0	0	1	0	1	0	0	0	**2**
5:00 PM	5:15 PM	0	1	0	0	0	1	1	0	1	0	0	1	**3**
5:15 PM	5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	5:45 PM	0	0	0	0	0	1	3	0	0	0	0	0	**4**
5:45 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
4:00 PM	5:00 PM	0	0	0	0	0	0	1	0	1	0	0	0	**2**
4:15 PM	5:15 PM	0	1	0	0	0	1	1	0	1	0	0	1	**5**
4:30 PM	5:30 PM	0	1	0	0	0	1	1	0	1	0	0	1	**5**
4:45 PM	5:45 PM	0	1	0	0	0	2	4	0	1	0	0	1	**9**
5:00 PM	6:00 PM	0	1	0	0	0	2	3	0	0	0	0	1	**7**

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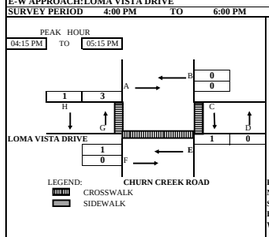
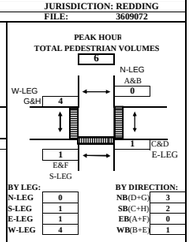
4:15 PM to 5:15 PM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH					
BICYCLE	1	1	2	1	**5**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** WEDNESDAY
E-W APPROACH: LOMA VISTA DRIVE — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





TIME PERIOD		NORTH X-WALK	EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	1	0	3	1	***5***
04:45 PM	--- 05:00 PM	0	0	0	0	1	0	3	1	***5***
05:00 PM	--- 05:15 PM	0	0	1	0	1	0	3	1	***6***
05:15 PM	--- 05:30 PM	0	0	1	0	1	0	3	2	***7***
05:30 PM	--- 05:45 PM	0	0	1	0	1	0	3	5	***10***
05:45 PM	--- 06:00 PM	0	0	1	0	1	0	3	6	***11***
TOTAL BY PERIOD										
04:00 PM	--- 04:15 PM	0	0	0	0	0	0	0	0	***0***
04:15 PM	--- 04:30 PM	0	0	0	0	0	0	0	0	***0***
04:30 PM	--- 04:45 PM	0	0	0	0	1	0	3	1	***5***
04:45 PM	--- 05:00 PM	0	0	0	0	0	0	0	0	***0***
05:00 PM	--- 05:15 PM	0	0	1	0	0	0	0	0	***1***
05:15 PM	--- 05:30 PM	0	0	0	0	0	0	0	1	***1***
05:30 PM	--- 05:45 PM	0	0	0	0	0	0	0	3	***3***
05:45 PM	--- 06:00 PM	0	0	0	0	0	0	0	1	***1***
HOURLY TOTALS										
04:00 PM	--- 05:00 PM	0	0	0	0	1	0	3	1	***5***
04:15 PM	--- 05:15 PM	0	0	1	0	1	0	3	2	***7***
04:30 PM	--- 05:30 PM	0	0	1	0	1	0	3	4	***9***
04:45 PM	--- 05:45 PM	0	0	1	0	1	0	3	5	***10***
05:00 PM	--- 06:00 PM	0	0	1	0	1	0	3	5	***10***

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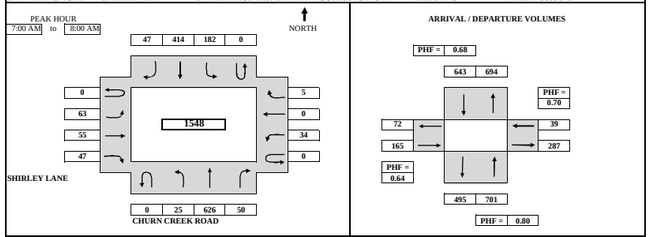
4:15 PM to 5:15 PM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION					
PEDESTRIAN	3	2	0	1	**6**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	1	1	4	**6**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016 **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: SHIRLEY LAN - ENTERPRISE H.S. DRIVEWA **JURISDICTION:** REDDING **FILE:** 3609072



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		3	112	2		76	87	6		9	7	9		10	0	2	**323**
7:15 AM	7:30 AM		10	286	39		153	219	32		32	33	24		23	0	3	**854**
7:30 AM	7:45 AM		18	469	47		178	323	39		43	55	41		34	0	5	**1252**
7:45 AM	8:00 AM		25	626	50		182	414	47		63	55	47		34	0	5	**1548**
8:00 AM	8:15 AM		30	748	50		190	499	53		74	55	52		35	0	5	**1791**
8:15 AM	8:30 AM		39	883	53		199	579	57		76	55	58		35	0	5	**2039**
8:30 AM	8:45 AM		42	977	54		202	665	57		83	56	64		35	0	5	**2240**
8:45 AM	9:00 AM		44	1073	54		207	738	59		87	56	67		35	0	5	**2425**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	3	112	2	0	76	87	6	0	9	7	9	0	10	0	2	**323**
7:15 AM	7:30 AM	0	7	174	37	0	77	132	26	0	23	26	15	0	13	0	1	**531**
7:30 AM	7:45 AM	0	8	183	8	0	25	104	7	0	11	22	17	0	11	0	2	**398**
7:45 AM	8:00 AM	0	7	157	3	0	4	91	8	0	20	0	6	0	0	0	0	**296**
8:00 AM	8:15 AM	0	5	122	0	0	8	85	6	0	11	0	5	0	1	0	0	**243**
8:15 AM	8:30 AM	0	9	135	3	0	9	80	4	0	2	0	6	0	0	0	0	**248**
8:30 AM	8:45 AM	0	3	94	1	0	3	86	0	0	7	1	6	0	0	0	0	**201**
8:45 AM	9:00 AM	0	2	96	0	0	5	73	2	0	4	0	3	0	0	0	0	**185**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	25	626	50	0	182	414	47	0	63	55	47	0	34	0	5	**1548**
7:15 AM	8:15 AM	0	27	636	48	0	114	412	47	0	65	48	43	0	25	0	3	**1468**
7:30 AM	8:30 AM	0	29	597	14	0	46	360	25	0	44	22	34	0	12	0	2	**1185**
7:45 AM	8:45 AM	0	24	508	7	0	24	342	18	0	40	1	23	0	1	0	0	**988**
8:00 AM	9:00 AM	0	19	447	4	0	25	324	12	0	24	1	20	0	1	0	0	**877**

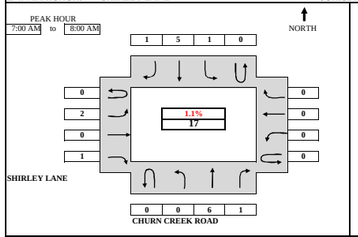
7:00 AM to 8:00 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
PEAK HOUR SUMMARY																	
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	25	626	50	0	182	414	47	0	63	55	47	0	34	0	5	**1548**
PHF BY MOVEMENT	0.00	0.78	0.86	0.34	0.00	0.59	0.78	0.45	0.00	0.68	0.53	0.69	0.00	0.65	0.00	0.63	OVERALL
PHF BY APPROACH		0.80				0.68				0.64				0.70			0.73
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	7		8		7		6		3		2		0		1		**17**
TRUCK PERCENTAGE	1.0%		1.2%		1.1%		1.2%		1.8%		0.7%		0.0%		1.4%		**1.1%**
BICYCLE	1				0				0				0				**1**
PEDESTRIAN BY DIR:	7				9				136				13				**165**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				149				6				10				**165**

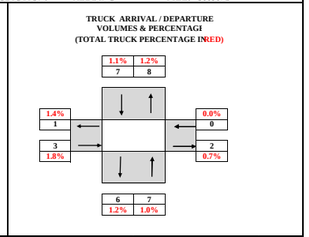
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016 **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: SHIRLEY LANE **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		0	1	0		1	0	0		0	0	0		0	0	0	**2**
7:15 AM	7:30 AM		0	2	0		1	0	0		0	0	0		0	0	0	**3**
7:30 AM	7:45 AM		0	4	0		1	1	0		2	0	0		0	0	0	**8**
7:45 AM	8:00 AM		0	6	1		1	5	1		2	0	1		0	0	0	**17**
8:00 AM	8:15 AM		0	8	1		3	6	2		2	0	1		0	0	0	**23**
8:15 AM	8:30 AM		0	11	1		5	7	2		2	0	1		0	0	0	**29**
8:30 AM	8:45 AM		0	12	1		6	9	2		2	0	1		0	0	0	**33**
8:45 AM	9:00 AM		0	13	1		6	14	2		2	0	1		0	0	0	**39**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	**2**
7:15 AM	7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
7:30 AM	7:45 AM	0	0	2	0	0	0	1	0	0	2	0	0	0	0	0	0	**5**
7:45 AM	8:00 AM	0	0	2	1	0	0	4	1	0	0	0	1	0	0	0	0	**9**
8:00 AM	8:15 AM	0	0	2	0	0	2	1	1	0	0	0	0	0	0	0	0	**6**
8:15 AM	8:30 AM	0	0	3	0	0	2	1	0	0	0	0	0	0	0	0	0	**6**
8:30 AM	8:45 AM	0	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	**4**
8:45 AM	9:00 AM	0	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	**6**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	0	6	1	0	1	5	1	0	2	0	1	0	0	0	0	**17**
7:15 AM	8:15 AM	0	0	7	1	0	2	6	2	0	2	0	1	0	0	0	0	**21**
7:30 AM	8:30 AM	0	0	9	1	0	4	7	2	0	2	0	1	0	0	0	0	**26**
7:45 AM	8:45 AM	0	0	8	1	0	5	8	2	0	0	0	1	0	0	0	0	**25**
8:00 AM	9:00 AM	0	0	7	0	0	5	9	1	0	0	0	0	0	0	0	0	**22**

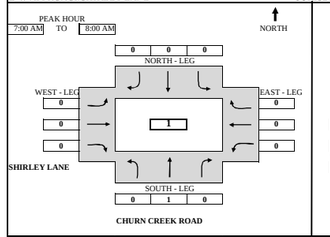
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

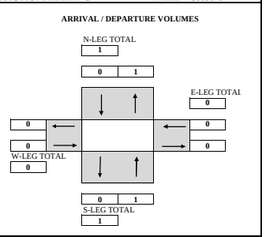
7:00 AM to 8:00 AM	NB		SB		EB		WB		OVERALL
DIRECTION	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	7	8	7	6	3	2	0	1	17
TRUCK PERCENTAGE	1.0%	1.2%	1.1%	1.2%	1.8%	0.7%	0.0%	1.4%	1.1%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016 **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD **SURVEY TIME:** 7:00 AM **TO** 9:00 AM
E-W APPROACH: SHIRLEY LANE **JURISDICTION:** REDDING **FILE:** 3609072





TIME PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From	To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM	8:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	**2**
8:15 AM	8:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	**2**
8:30 AM	8:45 AM	0	2	0	0	1	0	0	0	0	0	0	0	**3**
8:45 AM	9:00 AM	0	2	0	0	1	0	0	0	0	0	0	0	**3**
TOTAL BY PERIOD														
7:00 AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:00 AM	8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:15 AM	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	**1**
8:45 AM	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS														
7:00 AM	8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
7:15 AM	8:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	**2**
7:30 AM	8:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	**2**
7:45 AM	8:45 AM	0	2	0	0	1	0	0	0	0	0	0	0	**3**
8:00 AM	9:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	**2**

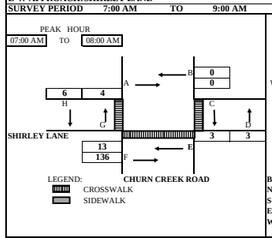
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

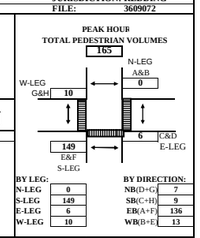
7:00 AM to 8:00 AM	NBT	SBT	EBT	WBT	TOTAL
VOLUME BY APPROACH					
BICYCLE	1	0	0	0	**1**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD **DAY:** WEDNESDAY
E-W APPROACH: SHIRLEY LANE **JURISDICTION:** REDDING
SURVEY PERIOD 7:00 AM **TO** 9:00 AM **FILE:** 3609072





TIME PERIOD		NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From	To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA										
07:00 AM	--- 07:15 AM	0	0	2	0	10	25	0	2	***39***
07:15 AM	--- 07:30 AM	0	0	2	0	11	124	0	6	***143***
07:30 AM	--- 07:45 AM	0	0	2	2	11	135	4	6	***160***
07:45 AM	--- 08:00 AM	0	0	3	3	13	136	4	6	***165***
08:00 AM	--- 08:15 AM	0	0	3	3	14	137	6	6	***169***
08:15 AM	--- 08:30 AM	0	0	3	3	14	137	6	7	***170***
08:30 AM	--- 08:45 AM	0	0	3	4	14	137	6	7	***171***
08:45 AM	--- 09:00 AM	0	0	3	4	14	137	7	7	***172***
TOTAL BY PERIOD										
07:00 AM	--- 07:15 AM	0	0	2	0	10	25	0	2	***39***
07:15 AM	--- 07:30 AM	0	0	0	0	1	99	0	4	***104***
07:30 AM	--- 07:45 AM	0	0	0	2	0	11	4	0	***17***
07:45 AM	--- 08:00 AM	0	0	1	1	2	1	0	0	***5***
08:00 AM	--- 08:15 AM	0	0	0	0	1	1	2	0	***4***
08:15 AM	--- 08:30 AM	0	0	0	0	0	0	0	1	***1***
08:30 AM	--- 08:45 AM	0	0	0	1	0	0	0	0	***1***
08:45 AM	--- 09:00 AM	0	0	0	0	0	0	1	0	***1***
HOURLY TOTALS										
07:00 AM	--- 08:00 AM	0	0	3	3	13	136	4	6	***165***
07:15 AM	--- 08:15 AM	0	0	1	3	4	112	6	4	***130***
07:30 AM	--- 08:30 AM	0	0	1	3	3	13	6	1	***27***
07:45 AM	--- 08:45 AM	0	0	1	2	3	2	2	1	***11***
08:00 AM	--- 09:00 AM	0	0	0	1	1	1	3	1	***7***

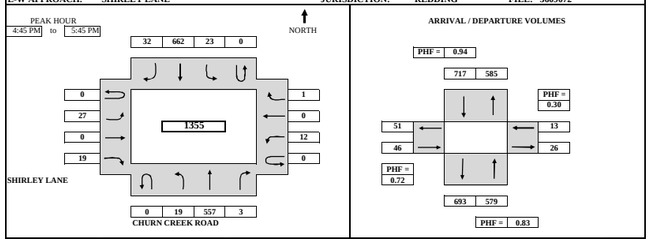
Tel : (510) 232-1271 Fax: (510) 232-1272

7:00 AM to 8:00 AM	NB	SB	EB	WB	TOTAL
VOLUME BY DIRECTION	7	9	136	13	**165**
PEDESTRIAN					
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	149	6	10	**165**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: SHIRLEY LANE — **JURISDICTION:** REDDING — **FILE:** 3609072



TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM		2	125	0		3	164	5		4	0	5		1	0	0	**309**
4:15 PM	to	4:30 PM		7	255	1		4	339	7		13	1	11		1	0	0	**639**
4:30 PM	to	4:45 PM		9	377	2		4	476	11		25	1	12		1	0	0	**918**
4:45 PM	to	5:00 PM		11	530	3		13	651	15		37	1	15		2	0	0	**1278**
5:00 PM	to	5:15 PM		17	671	5		23	817	22		45	1	23		12	0	1	**1637**
5:15 PM	to	5:30 PM		19	769	5		26	995	32		48	1	28		12	0	1	**1936**
5:30 PM	to	5:45 PM		28	934	5		27	1138	43		52	1	31		13	0	1	**2273**
5:45 PM	to	6:00 PM		37	1069	5		29	1284	54		59	1	35		13	0	1	**2587**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	2	125	0	0	3	164	5	0	4	0	5	0	1	0	0	**309**
4:15 PM	to	4:30 PM	0	5	130	1	0	1	175	2	0	9	1	6	0	0	0	0	**330**
4:30 PM	to	4:45 PM	0	2	122	1	0	0	137	4	0	12	0	1	0	0	0	0	**279**
4:45 PM	to	5:00 PM	0	2	153	1	0	9	175	4	0	12	0	3	0	1	0	0	**360**
5:00 PM	to	5:15 PM	0	6	141	2	0	10	166	7	0	8	0	8	0	10	0	1	**359**
5:15 PM	to	5:30 PM	0	2	98	0	0	3	178	10	0	3	0	5	0	0	0	0	**299**
5:30 PM	to	5:45 PM	0	9	165	0	0	1	143	11	0	4	0	3	0	1	0	0	**337**
5:45 PM	to	6:00 PM	0	9	135	0	0	2	146	11	0	7	0	4	0	0	0	0	**314**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	11	530	3	0	13	651	15	0	37	1	15	0	2	0	0	**1278**
4:15 PM	to	5:15 PM	0	15	546	5	0	20	653	17	0	41	1	18	0	11	0	1	**1328**
4:30 PM	to	5:30 PM	0	12	514	4	0	22	656	25	0	35	0	17	0	11	0	1	**1297**
4:45 PM	to	5:45 PM	0	19	557	3	0	23	662	32	0	27	0	19	0	12	0	1	**1355**
5:00 PM	to	6:00 PM	0	26	539	2	0	16	633	39	0	22	0	20	0	11	0	1	**1309**

4:45 PM to 5:45 PM — PEAK HOUR SUMMARY

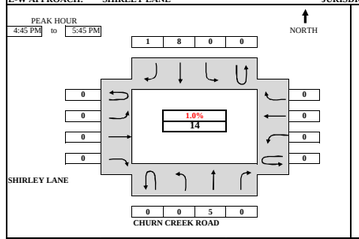
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	19	557	3	0	23	662	32	0	27	0	19	0	12	0	1	**1355**
PHF BY MOVEMENT	0.00	0.53	0.84	0.38	0.00	0.58	0.93	0.73	0.00	0.56	0.00	0.59	0.00	0.30	0.00	0.25	OVERALL
PHF BY APPROACH	0.83				0.94				0.72				0.30				0.94
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	5		5		9		8		0		0		0		1		**14**
TRUCK PERCENTAGE	0.9%		0.9%		1.3%		1.2%		0.0%		0.0%		0.0%		2.0%		**1.0%**
BICYCLE	2				0				0				0				**2**
PEDESTRIAN BY DIR:	4				6				1				3				**14**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG	0				4				4				6				**14**

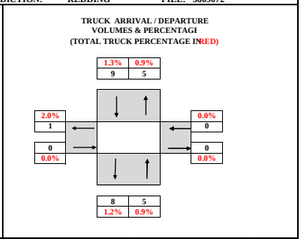
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: SHIRLEY LANE — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM		0	1	0		0	1	0		0	0	0		0	0	0	**2**
4:15 PM	to	4:30 PM		0	2	0		0	3	0		0	0	0		0	0	0	**5**
4:30 PM	to	4:45 PM		0	3	0		0	5	0		0	0	0		0	0	0	**8**
4:45 PM	to	5:00 PM		0	5	0		0	8	0		0	0	0		0	0	0	**13**
5:00 PM	to	5:15 PM		0	7	0		0	9	1		0	0	0		0	0	0	**17**
5:15 PM	to	5:30 PM		0	7	0		0	9	1		0	0	0		0	0	0	**17**
5:30 PM	to	5:45 PM		0	8	0		0	13	1		0	0	0		0	0	0	**22**
5:45 PM	to	6:00 PM		0	8	0		0	13	1		0	0	0		0	0	0	**22**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
4:15 PM	to	4:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	**3**
4:30 PM	to	4:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	**3**
4:45 PM	to	5:00 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	**5**
5:00 PM	to	5:15 PM	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	**4**
5:15 PM	to	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	to	5:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	**5**
5:45 PM	to	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0	**13**
4:15 PM	to	5:15 PM	0	0	6	0	0	0	8	1	0	0	0	0	0	0	0	0	**15**
4:30 PM	to	5:30 PM	0	0	5	0	0	0	6	1	0	0	0	0	0	0	0	0	**12**
4:45 PM	to	5:45 PM	0	0	5	0	0	0	8	1	0	0	0	0	0	0	0	0	**14**
5:00 PM	to	6:00 PM	0	0	3	0	0	0	5	1	0	0	0	0	0	0	0	0	**9**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

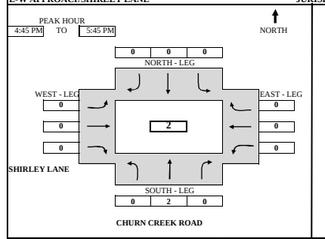
4:45 PM to 5:45 PM

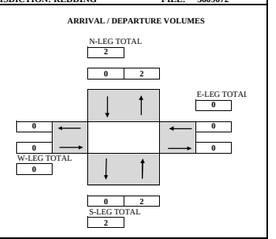
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	5	5	9	8	0	0	0	1	14
TRUCK PERCENTAGE	0.9%	0.9%	1.3%	1.2%	0.0%	0.0%	0.0%	2.0%	1.0%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016 — **DAY:** WEDNESDAY
N-S APPROACH: CHURN CREEK ROAD — **SURVEY TIME:** 4:00 PM — **TO** 6:00 PM
E-W APPROACH: SHIRLEY LANE — **JURISDICTION:** REDDING — **FILE:** 3609072





TIME PERIOD			NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From		To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA															
4:00 PM	to	4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4:15 PM	to	4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4:30 PM	to	4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4:45 PM	to	5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
5:00 PM	to	5:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	**2**
5:15 PM	to	5:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	**2**
5:30 PM	to	5:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	**3**
5:45 PM	to	6:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	**3**
TOTAL BY PERIOD															
4:00 PM	to	4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	to	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	to	5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
5:15 PM	to	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	to	5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
5:45 PM	to	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS															
4:00 PM	to	5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4:15 PM	to	5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4:30 PM	to	5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
4:45 PM	to	5:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	**2**
5:00 PM	to	6:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	**2**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

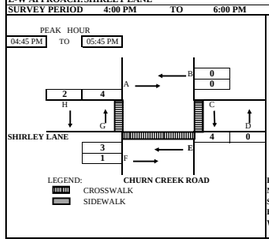
4:45 PM to 5:45 PM

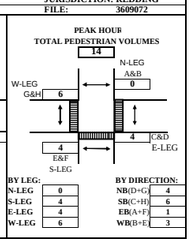
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	2	0	0	0	**2**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN REDDING — **SURVEY DATE:** 9/14/2016
N-S APPROACH: CHURN CREEK ROAD — **DAY:** WEDNESDAY
E-W APPROACH: SHIRLEY LANE — **JURISDICTION:** REDDING
SURVEY PERIOD 4:00 PM TO 6:00 PM — **FILE:** 3609072





TIME PERIOD			NORTH X-WALK	EAST X-WALK			SOUTH X-WALK		WEST X-WALK		
From		To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA											
04:00 PM	---	04:15 PM	0	0	0	3	4	0	0	0	*7*
04:15 PM	---	04:30 PM	0	0	0	3	4	0	0	0	*7*
04:30 PM	---	04:45 PM	0	0	0	3	4	0	0	1	*8*
04:45 PM	---	05:00 PM	0	0	1	3	7	0	1	1	*13*
05:00 PM	---	05:15 PM	0	0	3	3	7	1	3	1	*18*
05:15 PM	---	05:30 PM	0	0	3	3	7	1	3	3	*20*
05:30 PM	---	05:45 PM	0	0	4	3	7	1	4	3	*22*
05:45 PM	---	06:00 PM	0	0	5	3	7	1	6	3	*25*
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	0	0	0	3	4	0	0	0	*7*
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	1	*1*
04:45 PM	---	05:00 PM	0	0	1	0	3	0	1	0	*5*
05:00 PM	---	05:15 PM	0	0	2	0	0	1	2	0	*5*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	2	*2*
05:30 PM	---	05:45 PM	0	0	1	0	0	0	1	0	*2*
05:45 PM	---	06:00 PM	0	0	1	0	0	0	2	0	*3*
HOURLY TOTALS											
04:00 PM	---	05:00 PM	0	0	1	3	7	0	1	1	*13*
04:15 PM	---	05:15 PM	0	0	3	0	3	1	3	1	*11*
04:30 PM	---	05:30 PM	0	0	3	0	3	1	3	3	*13*
04:45 PM	---	05:45 PM	0	0	4	0	3	1	4	2	*14*
05:00 PM	---	06:00 PM	0	0	4	0	0	1	5	2	*12*

Tel : (510) 232-1271 *Fax: (510) 232-1272*

4:45 PM to 5:45 PM

VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	4	6	1	3	**14**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	4	4	6	**14**

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-001 SR 273 & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	SR 273 Southbound					S Bonnyview Rd Westbound					SR 273 Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	36	73	2	0	111	79	12	37	0	128	7	86	63	1	157	2	12	20	0	34	430	1
11:15	48	85	1	0	134	67	20	26	0	113	15	88	69	1	173	2	10	13	0	25	445	1
11:30	47	83	1	0	131	74	11	42	0	127	13	77	89	0	179	1	16	8	0	25	462	0
11:45	25	77	1	0	103	81	16	42	0	139	5	81	71	0	157	2	6	14	0	22	421	0
Total	156	318	5	0	479	301	59	147	0	507	40	332	292	2	666	7	44	55	0	106	1758	2
12:00	39	93	4	1	137	75	21	38	0	134	8	80	81	1	170	0	8	13	0	21	462	2
12:15	51	99	3	0	153	79	12	34	0	125	11	84	69	0	164	0	14	21	0	35	477	0
12:30	34	118	0	0	152	74	9	34	0	117	15	86	84	0	185	0	5	11	1	17	471	1
12:45	38	76	2	0	116	69	8	28	0	105	5	111	79	0	195	1	7	17	0	25	441	0
Total	162	386	9	1	558	297	50	134	0	481	39	361	313	1	714	1	34	62	1	98	1851	3
13:00	37	86	1	0	124	65	13	47	0	125	6	84	82	0	172	3	7	10	0	20	441	0
13:15	37	80	4	1	122	81	9	33	0	123	4	75	62	0	141	0	10	11	0	21	407	1
13:30	28	98	0	0	126	97	10	31	0	138	12	73	53	0	138	0	7	6	0	13	415	0
13:45	41	105	1	0	147	77	7	41	0	125	8	93	63	0	164	1	11	10	0	22	458	0
Total	143	369	6	1	519	320	39	152	0	511	30	325	260	0	615	4	35	37	0	76	1721	1
Grand Total	461	1073	20	2	1556	918	148	433	0	1499	109	1018	865	3	1995	12	113	154	1	280	5330	6
Apprch %	29.6%	69.0%	1.3%	0.1%		61.2%	9.9%	28.9%	0.0%		5.5%	51.0%	43.4%	0.2%		4.3%	40.4%	55.0%	0.4%			
Total %	8.6%	20.1%	0.4%	0.0%	29.2%	17.2%	2.8%	8.1%	0.0%	28.1%	2.0%	19.1%	16.2%	0.1%	37.4%	0.2%	2.1%	2.9%	0.0%	5.3%	100.0%	

NOON PEAK	SR 273 Southbound					S Bonnyview Rd Westbound					SR 273 Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	39	93	4	1	137	75	21	38	0	134	8	80	81	1	170	0	8	13	0	21	462
12:15	51	99	3	0	153	79	12	34	0	125	11	84	69	0	164	0	14	21	0	35	477
12:30	34	118	0	0	152	74	9	34	0	117	15	86	84	0	185	0	5	11	1	17	471
12:45	38	76	2	0	116	69	8	28	0	105	5	111	79	0	195	1	7	17	0	25	441
Total Volume	162	386	9	1	558	297	50	134	0	481	39	361	313	1	714	1	34	62	1	98	1851
% App Total	29.0%	69.2%	1.6%	0.2%		61.7%	10.4%	27.9%	0.0%		5.5%	50.6%	43.8%	0.1%		1.0%	34.7%	63.3%	1.0%		
PHF	.794	.818	.563	.250	.912	.940	.595	.882	.000	.897	.650	.813	.932	.250	.915	.250	.607	.738	.250	.700	.970

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-001 SR 273 & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	SR 273 Southbound					S Bonnyview Rd Westbound					SR 273 Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	1	1	0	0	2	4	2	0	0	6	0	2	0	0	2	0	0	0	0	0	10	0
11:15	2	0	0	0	2	1	1	0	0	2	0	0	6	0	6	0	1	0	1	1	11	1
11:30	1	0	0	0	1	2	0	1	0	3	0	0	2	0	2	0	1	0	0	1	7	0
11:45	0	1	0	0	1	1	1	1	0	3	1	2	2	0	5	0	0	0	0	0	9	0
Total	4	2	0	0	6	8	4	2	0	14	1	4	10	0	15	0	2	0	1	2	37	1
12:00	1	0	0	0	1	1	0	2	0	3	0	0	3	3	3	0	0	0	0	0	7	3
12:15	3	2	0	0	5	2	1	1	0	4	0	0	3	2	3	0	0	0	0	0	12	2
12:30	1	0	0	0	1	1	0	1	0	2	0	0	2	3	2	0	0	0	0	0	5	3
12:45	0	2	0	0	2	1	0	1	0	2	1	1	0	0	2	0	0	0	0	0	6	0
Total	5	4	0	0	9	5	1	5	0	11	1	1	8	8	10	0	0	0	0	0	30	8
13:00	0	1	0	0	1	0	0	1	0	1	0	0	3	2	3	1	0	0	0	1	6	2
13:15	0	1	0	0	1	2	1	0	0	3	0	0	4	0	4	0	0	0	0	0	8	0
13:30	1	1	0	0	2	0	0	3	0	3	0	2	1	1	3	0	0	0	0	0	8	1
13:45	0	2	0	0	2	0	0	0	0	0	1	0	1	2	2	0	0	0	1	0	4	3
Total	1	5	0	0	6	2	1	4	0	7	1	2	9	5	12	1	0	0	1	1	26	6
Grand Total	10	11	0	0	21	15	6	11	0	32	3	7	27	13	37	1	2	0	2	3	93	15
Apprch %	47.6%	52.4%	0.0%			46.9%	18.8%	34.4%			8.1%	18.9%	73.0%			33.3%	66.7%	0.0%				
Total %	10.8%	11.8%	0.0%		22.6%	16.1%	6.5%	11.8%		34.4%	3.2%	7.5%	29.0%		39.8%	1.1%	2.2%	0.0%		3.2%	100.0%	

NOON PEAK	SR 273 Southbound					S Bonnyview Rd Westbound					SR 273 Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	1	0	0	0	1	1	0	2	0	3	0	0	3	3	3	0	0	0	0	0	7
12:15	3	2	0	0	5	2	1	1	0	4	0	0	3	2	3	0	0	0	0	0	12
12:30	1	0	0	0	1	1	0	1	0	2	0	0	2	3	2	0	0	0	0	0	5
12:45	0	2	0	0	2	1	0	1	0	2	1	1	0	0	2	0	0	0	0	0	6
Total Volume	5	4	0	0	9	5	1	5	0	11	1	1	8	8	10	0	0	0	0	0	30
% App Total	55.6%	44.4%	0.0%			45.5%	9.1%	45.5%			10.0%	10.0%	80.0%			0.0%	0.0%	0.0%			
PHF	.417	.500	.000		.450	.625	.250	.625		.688	.250	.250	.667		.833	.000	.000	.000		.000	.625

Southbound Peds = North Leg (traveling EB or WB)
Westbound Peds = East Leg (traveling NB or SB)
Northbound Peds = South Leg (traveling EB or WB)
Eastbound Peds = West Leg (traveling NB or SB)

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-001 SR 273 & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	SR 273 Southbound					S Bonnyview Rd Westbound					SR 273 Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	2	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
13:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2	0
Grand Total	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	0	2	0	0	2	5	0
Apprch %	0.0%	0.0%	0.0%			0.0%	0.0%	100.0%			100.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	20.0%		20.0%	40.0%	0.0%	0.0%		40.0%	0.0%	40.0%	0.0%		40.0%	100.0%	

NOON PEAK	SR 273 Southbound					S Bonnyview Rd Westbound					SR 273 Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-002 Eastside Rd & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Eastside Rd Southbound					S Bonnyview Rd Westbound					Eastside Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	15	8	3	0	26	49	96	7	1	153	17	5	50	0	72	18	91	13	1	123	374	2
11:15	9	8	2	0	19	50	100	11	0	161	18	8	53	0	79	7	102	13	1	123	382	1
11:30	13	6	4	0	23	67	109	13	1	190	15	13	70	0	98	14	109	17	3	143	454	4
11:45	14	5	7	0	26	45	115	9	1	170	14	6	86	0	106	1	91	11	2	105	407	3
Total	51	27	16	0	94	211	420	40	3	674	64	32	259	0	355	40	393	54	7	494	1617	10
12:00	10	12	2	0	24	54	112	7	0	173	23	4	58	0	85	7	97	12	3	119	401	3
12:15	4	7	4	0	15	53	98	8	1	160	16	4	57	1	78	4	118	11	9	142	395	11
12:30	16	7	3	0	26	53	101	10	2	166	9	7	63	0	79	10	101	9	6	126	397	8
12:45	9	1	2	0	12	63	89	8	1	161	11	6	45	0	62	8	99	11	4	122	357	5
Total	39	27	11	0	77	223	400	33	4	660	59	21	223	1	304	29	415	43	22	509	1550	27
13:00	7	3	3	0	13	61	105	11	1	178	11	8	50	0	69	4	100	15	0	119	379	1
13:15	14	8	4	0	26	57	102	4	1	164	13	6	59	0	78	6	87	12	4	109	377	5
13:30	15	7	6	0	28	44	118	13	0	175	19	10	60	0	89	7	76	6	0	89	381	0
13:45	8	10	3	0	21	45	104	7	1	157	10	5	65	0	80	7	91	10	2	110	368	3
Total	44	28	16	0	88	207	429	35	3	674	53	29	234	0	316	24	354	43	6	427	1505	9
Grand Total	134	82	43	0	259	641	1249	108	10	2008	176	82	716	1	975	93	1162	140	35	1430	4672	46
Apprch %	51.7%	31.7%	16.6%	0.0%		31.9%	62.2%	5.4%	0.5%		18.1%	8.4%	73.4%	0.1%		6.5%	81.3%	9.8%	2.4%			
Total %	2.9%	1.8%	0.9%	0.0%	5.5%	13.7%	26.7%	2.3%	0.2%	43.0%	3.8%	1.8%	15.3%	0.0%	20.9%	2.0%	24.9%	3.0%	0.7%	30.6%	100.0%	

NOON PEAK	Eastside Rd Southbound					S Bonnyview Rd Westbound					Eastside Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	13	6	4	0	23	67	109	13	1	190	15	13	70	0	98	14	109	17	3	143	454
11:45	14	5	7	0	26	45	115	9	1	170	14	6	86	0	106	1	91	11	2	105	407
12:00	10	12	2	0	24	54	112	7	0	173	23	4	58	0	85	7	97	12	3	119	401
12:15	4	7	4	0	15	53	98	8	1	160	16	4	57	1	78	4	118	11	9	142	395
Total Volume	41	30	17	0	88	219	434	37	3	693	68	27	271	1	367	26	415	51	17	509	1657
% App Total	46.6%	34.1%	19.3%	0.0%		31.6%	62.6%	5.3%	0.4%		18.5%	7.4%	73.8%	0.3%		5.1%	81.5%	10.0%	3.3%		
PHF	.732	.625	.607	.000	.846	.817	.943	.712	.750	.912	.739	.519	.788	.250	.866	.464	.879	.750	.472	.890	.912

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-002 Eastside Rd & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Eastside Rd Southbound					S Bonnyview Rd Westbound					Eastside Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	2	1	0	0	3	0	5	1	0	6	1	1	0	0	2	0	1	0	0	1	12	0
11:15	1	0	0	0	1	0	2	2	0	4	0	0	1	0	1	2	7	0	0	9	15	0
11:30	0	0	0	0	0	1	2	1	0	4	1	2	0	0	3	1	3	0	0	4	11	0
11:45	2	0	1	0	3	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	8	0
Total	5	1	1	0	7	1	11	5	0	17	2	3	1	0	6	3	13	0	0	16	46	0
12:00	1	1	0	0	2	0	3	1	0	4	0	0	0	0	0	3	1	0	0	4	10	0
12:15	0	0	0	0	0	0	5	2	0	7	0	0	0	0	0	0	6	0	0	6	13	0
12:30	1	0	0	0	1	1	2	1	0	4	0	0	0	0	0	1	2	0	0	3	8	0
12:45	2	0	0	0	2	3	1	2	1	6	0	0	0	0	0	0	0	0	0	0	8	1
Total	4	1	0	0	5	4	11	6	1	21	0	0	0	0	0	4	9	0	0	13	39	1
13:00	1	0	0	1	1	0	0	1	0	1	0	0	0	0	0	1	2	0	1	3	5	2
13:15	2	0	0	0	2	1	3	2	0	6	0	0	0	0	0	2	2	0	0	4	12	0
13:30	6	0	0	0	6	1	1	1	0	3	2	0	0	0	2	1	1	0	0	2	13	0
13:45	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	3	1	2	4
Total	9	0	0	2	9	3	4	4	0	11	2	0	0	0	2	4	6	0	4	10	32	6
Grand Total	18	2	1	2	21	8	26	15	1	49	4	3	1	0	8	11	28	0	4	39	117	7
Apprch %	85.7%	9.5%	4.8%			16.3%	53.1%	30.6%			50.0%	37.5%	12.5%			28.2%	71.8%	0.0%				
Total %	15.4%	1.7%	0.9%		17.9%	6.8%	22.2%	12.8%		41.9%	3.4%	2.6%	0.9%		6.8%	9.4%	23.9%	0.0%		33.3%	100.0%	

NOON PEAK	Eastside Rd Southbound					S Bonnyview Rd Westbound					Eastside Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	0	0	0	0	0	1	2	1	0	4	1	2	0	0	3	1	3	0	0	4	11
11:45	2	0	1	0	3	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	8
12:00	1	1	0	0	2	0	3	1	0	4	0	0	0	0	0	3	1	0	0	4	10
12:15	0	0	0	0	0	0	5	2	0	7	0	0	0	0	0	0	6	0	0	6	13
Total Volume	3	1	1	0	5	1	12	5	0	18	1	2	0	0	3	4	12	0	0	16	42
% App Total	60.0%	20.0%	20.0%			5.6%	66.7%	27.8%			33.3%	66.7%	0.0%			25.0%	75.0%	0.0%			
PHF	.375	.250	.250		.417	.250	.600	.625		.643	.250	.250	.000		.250	.333	.500	.000		.667	.808

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-002 Eastside Rd & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Eastside Rd Southbound					S Bonnyview Rd Westbound					Eastside Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3	0	1	0	0	1	4	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3	0	1	0	0	1	4	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0
12:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Grand Total	1	0	0	0	1	0	0	0	0	0	0	2	2	0	4	0	2	0	0	2	7	0
Apprch %	100.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	50.0%	50.0%			0.0%	100.0%	0.0%				
Total %	14.3%	0.0%	0.0%		14.3%	0.0%	0.0%	0.0%		0.0%	0.0%	28.6%	28.6%		57.1%	0.0%	28.6%	0.0%		28.6%	100.0%	

NOON PEAK	Eastside Rd Southbound					S Bonnyview Rd Westbound					Eastside Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-003 E. Bonnyview Rd & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	E. Bonnyview Rd Southbound					S Bonnyview Rd Westbound					E. Bonnyview Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	28	0	12	0	40	0	147	33	0	180	0	0	0	0	0	13	160	0	0	173	393	0
11:15	38	0	11	0	49	0	152	34	0	186	0	0	0	0	0	19	148	0	1	168	403	1
11:30	30	0	18	0	48	0	164	38	0	202	1	0	0	0	1	16	176	0	1	193	444	1
11:45	32	0	7	1	40	0	167	36	1	204	0	0	0	0	0	13	179	0	0	192	436	2
Total	128	0	48	1	177	0	630	141	1	772	1	0	0	0	1	61	663	0	2	726	1676	4
12:00	39	2	14	0	55	2	160	30	1	193	0	2	0	0	2	15	149	0	1	165	415	2
12:15	35	0	7	0	42	0	151	37	0	188	0	0	0	0	0	6	173	0	0	179	409	0
12:30	31	0	13	0	44	0	153	33	0	186	0	0	0	0	0	10	175	1	0	186	416	0
12:45	33	0	7	0	40	1	155	30	1	187	0	1	1	0	2	10	137	0	0	147	376	1
Total	138	2	41	0	181	3	619	130	2	754	0	3	1	0	4	41	634	1	1	677	1616	3
13:00	21	0	7	0	28	1	159	33	1	194	1	1	0	0	2	9	154	0	0	163	387	1
13:15	29	0	7	0	36	0	160	28	0	188	1	0	0	0	1	10	148	1	0	159	384	0
13:30	36	0	13	0	49	0	161	30	1	192	0	0	0	0	0	6	142	0	1	149	390	2
13:45	25	0	8	0	33	0	148	27	0	175	1	0	0	0	1	10	148	0	0	158	367	0
Total	111	0	35	0	146	1	628	118	2	749	3	1	0	0	4	35	592	1	1	629	1528	3
Grand Total	377	2	124	1	504	4	1877	389	5	2275	4	4	1	0	9	137	1889	2	4	2032	4820	10
Apprch %	74.8%	0.4%	24.6%	0.2%		0.2%	82.5%	17.1%	0.2%		44.4%	44.4%	11.1%	0.0%		6.7%	93.0%	0.1%	0.2%			
Total %	7.8%	0.0%	2.6%	0.0%	10.5%	0.1%	38.9%	8.1%	0.1%	47.2%	0.1%	0.1%	0.0%	0.0%	0.2%	2.8%	39.2%	0.0%	0.1%	42.2%	100.0%	

NOON PEAK	E. Bonnyview Rd Southbound					S Bonnyview Rd Westbound					E. Bonnyview Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	30	0	18	0	48	0	164	38	0	202	1	0	0	0	1	16	176	0	1	193	444
11:45	32	0	7	1	40	0	167	36	1	204	0	0	0	0	0	13	179	0	0	192	436
12:00	39	2	14	0	55	2	160	30	1	193	0	2	0	0	2	15	149	0	1	165	415
12:15	35	0	7	0	42	0	151	37	0	188	0	0	0	0	0	6	173	0	0	179	409
Total Volume	136	2	46	1	185	2	642	141	2	787	1	2	0	0	3	50	677	0	2	729	1704
% App Total	73.5%	1.1%	24.9%	0.5%		0.3%	81.6%	17.9%	0.3%		33.3%	66.7%	0.0%	0.0%		6.9%	92.9%	0.0%	0.3%		
PHF	.872	.250	.639	.250	.841	.250	.961	.928	.500	.964	.250	.250	.000	.000	.375	.781	.946	.000	.500	.944	.959

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-003 E. Bonnyview Rd & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	E. Bonnyview Rd Southbound					S Bonnyview Rd Westbound					E. Bonnyview Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10	0
11:15	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	0	9	0	0	9	15	0
11:30	0	0	1	0	1	0	3	1	0	4	0	0	0	0	0	1	4	0	0	5	10	0
11:45	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	4	0	0	4	9	0
Total	1	0	1	0	2	0	18	2	0	20	0	0	0	0	0	1	21	0	0	22	44	0
12:00	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	6	0
12:15	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	12	0
12:30	0	0	1	1	1	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	7	1
12:45	0	0	0	1	0	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	8	1
Total	0	0	2	2	2	0	18	0	0	18	0	0	0	0	0	0	13	0	0	13	33	2
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4	0
13:15	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	11	0
13:30	0	0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	6	1
13:45	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	0	2	4	0
Total	0	0	2	1	2	0	9	1	0	10	0	0	0	0	0	1	12	0	0	13	25	1
Grand Total	1	0	5	3	6	0	45	3	0	48	0	0	0	0	0	2	46	0	0	48	102	3
Apprch %	16.7%	0.0%	83.3%			0.0%	93.8%	6.3%			0.0%	0.0%	0.0%			4.2%	95.8%	0.0%				
Total %	1.0%	0.0%	4.9%		5.9%	0.0%	44.1%	2.9%		47.1%	0.0%	0.0%	0.0%		0.0%	2.0%	45.1%	0.0%		47.1%	100.0%	

NOON PEAK	E. Bonnyview Rd Southbound					S Bonnyview Rd Westbound					E. Bonnyview Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	0	0	1	0	1	0	3	1	0	4	0	0	0	0	0	1	4	0	0	5	10
11:45	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	4	0	0	4	9
12:00	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	6
12:15	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	12
Total Volume	0	0	2	0	2	0	17	2	0	19	0	0	0	0	0	1	15	0	0	16	37
% App Total	0.0%	0.0%	100.0%			0.0%	89.5%	10.5%			0.0%	0.0%	0.0%			6.3%	93.8%	0.0%			
PHF	.000	.000	.500		.500	.000	.850	.500		.950	.000	.000	.000		.000	.250	.625	.000		.667	.771

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-003 E. Bonnyview Rd & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	E. Bonnyview Rd Southbound					S Bonnyview Rd Westbound					E. Bonnyview Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	0	2	3	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:45	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	2	0
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	0	2	3	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Grand Total	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	5	0	0	5	7	0
Apprch %	0.0%	0.0%	0.0%			0.0%	0.0%	100.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	28.6%		28.6%	0.0%	0.0%	0.0%		0.0%	0.0%	71.4%	0.0%		71.4%	100.0%	

NOON PEAK	E. Bonnyview Rd Southbound					S Bonnyview Rd Westbound					E. Bonnyview Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	100.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.250		.250	.000	.000	.000		.000	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-004 Indianwood Dr & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Indianwood Dr Southbound					S Bonnyview Rd Westbound					Indianwood Dr Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	8	0	8	0	16	0	166	5	2	173	0	0	2	0	2	6	177	0	1	184	375	3
11:15	5	0	3	0	8	1	198	6	0	205	0	0	1	0	1	2	188	0	1	191	405	1
11:30	6	0	3	0	9	3	191	5	1	200	1	0	2	0	3	1	190	2	0	193	405	1
11:45	9	0	8	0	17	2	181	8	1	192	0	0	2	0	2	4	213	1	0	218	429	1
Total	28	0	22	0	50	6	736	24	4	770	1	0	7	0	8	13	768	3	2	786	1614	6
12:00	3	0	4	0	7	1	185	6	0	192	2	0	1	0	3	2	184	2	0	188	390	0
12:15	5	0	6	0	11	5	180	5	2	192	0	0	5	0	5	3	209	3	1	216	424	3
12:30	5	0	3	0	8	2	182	4	0	188	4	0	2	0	6	4	191	2	0	197	399	0
12:45	4	0	1	0	5	0	186	4	0	190	1	0	2	0	3	2	175	0	0	177	375	0
Total	17	0	14	0	31	8	733	19	2	762	7	0	10	0	17	11	759	7	1	778	1588	3
13:00	5	0	3	0	8	4	196	7	1	208	1	0	1	0	2	2	183	1	0	186	404	1
13:15	7	0	1	0	8	5	192	5	1	203	1	0	4	0	5	2	177	2	0	181	397	1
13:30	3	0	4	0	7	3	187	3	2	195	1	0	3	0	4	1	182	1	0	184	390	2
13:45	3	0	3	0	6	4	168	3	1	176	0	0	2	0	2	2	159	0	1	162	346	2
Total	18	0	11	0	29	16	743	18	5	782	3	0	10	0	13	7	701	4	1	713	1537	6
Grand Total	63	0	47	0	110	30	2212	61	11	2314	11	0	27	0	38	31	2228	14	4	2277	4739	15
Apprch %	57.3%	0.0%	42.7%	0.0%		1.3%	95.6%	2.6%	0.5%		28.9%	0.0%	71.1%	0.0%		1.4%	97.8%	0.6%	0.2%			
Total %	1.3%	0.0%	1.0%	0.0%	2.3%	0.6%	46.7%	1.3%	0.2%	48.8%	0.2%	0.0%	0.6%	0.0%	0.8%	0.7%	47.0%	0.3%	0.1%	48.0%	100.0%	

NOON PEAK	Indianwood Dr Southbound					S Bonnyview Rd Westbound					Indianwood Dr Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	6	0	3	0	9	3	191	5	1	200	1	0	2	0	3	1	190	2	0	193	405
11:45	9	0	8	0	17	2	181	8	1	192	0	0	2	0	2	4	213	1	0	218	429
12:00	3	0	4	0	7	1	185	6	0	192	2	0	1	0	3	2	184	2	0	188	390
12:15	5	0	6	0	11	5	180	5	2	192	0	0	5	0	5	3	209	3	1	216	424
Total Volume	23	0	21	0	44	11	737	24	4	776	3	0	10	0	13	10	796	8	1	815	1648
% App Total	52.3%	0.0%	47.7%	0.0%		1.4%	95.0%	3.1%	0.5%		23.1%	0.0%	76.9%	0.0%		1.2%	97.7%	1.0%	0.1%		
PHF	.639	.000	.656	.000	.647	.550	.965	.750	.500	.970	.375	.000	.500	.000	.650	.625	.934	.667	.250	.935	.960

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-004 Indianwood Dr & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Indianwood Dr Southbound					S Bonnyview Rd Westbound					Indianwood Dr Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	3	0	0	3	9	0
11:15	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	0	10	0	0	10	16	0
11:30	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6	0
11:45	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	1	5	0	0	6	13	0
Total	0	0	0	0	0	2	21	0	0	23	0	0	0	0	0	1	20	0	0	21	44	0
12:00	0	0	1	0	1	0	2	1	0	3	1	0	0	0	1	0	2	0	0	2	7	0
12:15	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	5	1	0	6	11	0
12:30	0	0	0	1	0	0	1	0	0	1	1	0	1	0	2	0	4	0	0	4	7	1
12:45	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	8	0
Total	0	0	1	1	1	0	14	1	0	15	2	0	1	0	3	0	13	1	0	14	33	1
13:00	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	3	0	0	3	5	0
13:15	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	3	0	1	3	10	1
13:30	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	7	0
13:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	3	0
Total	1	0	1	0	2	0	9	1	0	10	0	0	0	0	0	1	12	0	1	13	25	1
Grand Total	1	0	2	1	3	2	44	2	0	48	2	0	1	0	3	2	45	1	1	48	102	2
Apprch %	33.3%	0.0%	66.7%			4.2%	91.7%	4.2%			66.7%	0.0%	33.3%			4.2%	93.8%	2.1%				
Total %	1.0%	0.0%	2.0%		2.9%	2.0%	43.1%	2.0%		47.1%	2.0%	0.0%	1.0%		2.9%	2.0%	44.1%	1.0%		47.1%	100.0%	

NOON PEAK	Indianwood Dr Southbound					S Bonnyview Rd Westbound					Indianwood Dr Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
11:45	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	1	5	0	0	6	13
12:00	0	0	1	0	1	0	2	1	0	3	1	0	0	0	1	0	2	0	0	2	7
12:15	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	5	1	0	6	11
Total Volume	0	0	1	0	1	1	17	1	0	19	1	0	0	0	1	1	14	1	0	16	37
% App Total	0.0%	0.0%	100.0%			5.3%	89.5%	5.3%			100.0%	0.0%	0.0%			6.3%	87.5%	6.3%			
PHF	.000	.000	.250		.250	.250	.708	.250		.679	.250	.000	.000		.250	.250	.700	.250		.667	.712

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-004 Indianwood Dr & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Indianwood Dr Southbound					S Bonnyview Rd Westbound					Indianwood Dr Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	3	0
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0
Grand Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	2	0	5	8	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	60.0%	40.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	37.5%	0.0%		37.5%	0.0%	0.0%	0.0%		0.0%	0.0%	37.5%	25.0%		62.5%	100.0%	

NOON PEAK	Indianwood Dr Southbound					S Bonnyview Rd Westbound					Indianwood Dr Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:30 to 12:30																					
Peak Hour For Entire Intersection Begins at 11:30																					
11:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.500	.000		.500	.000	.000	.000		.000	.000	.000	.000		.000	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-005 Bechelli Ln & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Bechelli Ln Southbound					S Bonnyview Rd Westbound					Bechelli Ln Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	11	1	35	0	47	0	139	23	0	162	5	3	1	0	9	18	166	2	0	186	404	0
11:15	29	3	34	1	67	3	164	29	2	198	2	3	0	0	5	23	172	1	0	196	466	3
11:30	18	2	42	0	62	1	157	25	1	184	0	2	4	0	6	25	178	2	0	205	457	1
11:45	28	2	30	0	60	2	160	29	0	191	5	5	3	0	13	31	187	2	0	220	484	0
Total	86	8	141	1	236	6	620	106	3	735	12	13	8	0	33	97	703	7	0	807	1811	4
12:00	41	0	34	0	75	1	154	21	1	177	0	1	1	0	2	27	162	1	0	190	444	1
12:15	29	0	39	0	68	2	141	21	0	164	8	1	1	0	10	21	194	5	1	221	463	1
12:30	20	2	32	0	54	0	151	25	1	177	5	2	2	0	9	32	166	1	0	199	439	1
12:45	30	1	35	0	66	1	153	30	0	184	3	0	3	0	6	35	144	1	0	180	436	0
Total	120	3	140	0	263	4	599	97	2	702	16	4	7	0	27	115	666	8	1	790	1782	3
13:00	32	2	35	0	69	0	164	26	0	190	10	3	1	0	14	20	160	4	0	184	457	0
13:15	18	6	34	0	58	0	168	18	2	188	2	4	2	0	8	22	162	2	0	186	440	2
13:30	42	1	34	0	77	3	152	26	1	182	6	4	0	0	10	19	163	2	0	184	453	1
13:45	23	3	33	0	59	1	135	28	0	164	4	1	0	0	5	17	149	3	0	169	397	0
Total	115	12	136	0	263	4	619	98	3	724	22	12	3	0	37	78	634	11	0	723	1747	3
Grand Total	321	23	417	1	762	14	1838	301	8	2161	50	29	18	0	97	290	2003	26	1	2320	5340	10
Apprch %	42.1%	3.0%	54.7%	0.1%		0.6%	85.1%	13.9%	0.4%		51.5%	29.9%	18.6%	0.0%		12.5%	86.3%	1.1%	0.0%			
Total %	6.0%	0.4%	7.8%	0.0%	14.3%	0.3%	34.4%	5.6%	0.1%	40.5%	0.9%	0.5%	0.3%	0.0%	1.8%	5.4%	37.5%	0.5%	0.0%	43.4%	100.0%	

NOON PEAK	Bechelli Ln Southbound					S Bonnyview Rd Westbound					Bechelli Ln Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	29	3	34	1	67	3	164	29	2	198	2	3	0	0	5	23	172	1	0	196	466
11:30	18	2	42	0	62	1	157	25	1	184	0	2	4	0	6	25	178	2	0	205	457
11:45	28	2	30	0	60	2	160	29	0	191	5	5	3	0	13	31	187	2	0	220	484
12:00	41	0	34	0	75	1	154	21	1	177	0	1	1	0	2	27	162	1	0	190	444
Total Volume	116	7	140	1	264	7	635	104	4	750	7	11	8	0	26	106	699	6	0	811	1851
% App Total	43.9%	2.7%	53.0%	0.4%		0.9%	84.7%	13.9%	0.5%		26.9%	42.3%	30.8%	0.0%		13.1%	86.2%	0.7%	0.0%		
PHF	.707	.583	.833	.250	.880	.583	.968	.897	.500	.947	.350	.550	.500	.000	.500	.855	.934	.750	.000	.922	.956

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-005 Bechelli Ln & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Bechelli Ln Southbound					S Bonnyview Rd Westbound					Bechelli Ln Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	1	0	0	6	0	0	6	0	1	0	0	1	0	3	0	1	3	10	2
11:15	0	0	0	1	0	0	6	0	0	6	0	0	0	1	0	0	11	0	0	11	17	2
11:30	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	7	0
11:45	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12	0
Total	1	0	0	2	1	0	23	0	0	23	0	1	0	1	1	0	21	0	1	21	46	4
12:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
12:15	0	0	1	0	1	0	4	0	0	4	0	0	1	0	1	1	5	0	1	6	12	1
12:30	0	0	0	1	0	0	1	1	0	2	0	0	0	0	0	1	3	1	0	5	7	1
12:45	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	8	0
Total	0	0	1	1	1	0	13	1	0	14	0	0	1	0	1	2	10	1	1	13	29	2
13:00	0	0	1	0	1	0	1	0	0	1	0	0	0	2	0	0	3	0	1	3	5	3
13:15	0	0	0	0	0	0	7	0	0	7	0	0	0	1	0	0	3	0	1	3	10	2
13:30	0	1	0	0	1	0	1	1	0	2	0	0	0	0	0	0	6	0	0	6	9	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1
Total	0	1	1	0	2	0	9	1	0	10	0	0	0	3	0	0	13	0	3	13	25	6
Grand Total	1	1	2	3	4	0	45	2	0	47	0	1	1	4	2	2	44	1	5	47	100	12
Apprch %	25.0%	25.0%	50.0%			0.0%	95.7%	4.3%			0.0%	50.0%	50.0%			4.3%	93.6%	2.1%				
Total %	1.0%	1.0%	2.0%		4.0%	0.0%	45.0%	2.0%		47.0%	0.0%	1.0%	1.0%		2.0%	2.0%	44.0%	1.0%		47.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					S Bonnyview Rd Westbound					Bechelli Ln Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	1	0	0	6	0	0	6	0	0	0	1	0	0	11	0	0	11	17
11:30	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	7
11:45	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
12:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total Volume	1	0	0	1	1	0	19	0	0	19	0	0	0	1	0	0	18	0	0	18	38
% App Total	100.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.250	.000	.000		.250	.000	.679	.000		.679	.000	.000	.000		.000	.000	.409	.000		.409	.559

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-005 Bechelli Ln & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Bechelli Ln Southbound					S Bonnyview Rd Westbound					Bechelli Ln Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
11:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Total	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	1	0	0	1	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0
Grand Total	0	0	1	0	1	0	2	1	0	3	0	0	0	0	0	0	2	2	0	4	8	0
Apprch %	0.0%	0.0%	100.0%			0.0%	66.7%	33.3%			0.0%	0.0%	0.0%			0.0%	50.0%	50.0%				
Total %	0.0%	0.0%	12.5%		12.5%	0.0%	25.0%	12.5%		37.5%	0.0%	0.0%	0.0%		0.0%	0.0%	25.0%	25.0%		50.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					S Bonnyview Rd Westbound					Bechelli Ln Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	3
% App Total	0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	100.0%			
PHF	.000	.000	.250		.250	.000	.250	.000		.250	.000	.000	.000		.000	.000	.000	.250		.250	.750

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-006 Texaco Gas Station Dwy & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Texaco Gas Station Dwy Southbound					S Bonnyview Rd Westbound					Texaco Gas Station Dwy Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	0	0	0	0	0	5	161	0	0	166	0	0	5	0	5	0	175	1	0	176	347	0
11:15	0	0	0	0	0	11	192	0	0	203	0	0	9	0	9	0	199	1	0	200	412	0
11:30	0	0	0	0	0	8	187	0	0	195	0	0	4	0	4	0	201	0	0	201	400	0
11:45	0	0	0	0	0	5	186	0	1	192	0	0	8	0	8	0	218	1	0	219	419	1
Total	0	0	0	0	0	29	726	0	1	756	0	0	26	0	26	0	793	3	0	796	1578	1
12:00	0	0	0	0	0	10	186	0	0	196	0	0	11	0	11	0	196	1	0	197	404	0
12:15	0	0	0	0	0	11	159	0	0	170	0	0	5	0	5	0	221	0	0	221	396	0
12:30	0	0	0	0	0	5	178	0	0	183	0	0	4	0	4	0	193	2	0	195	382	0
12:45	0	0	0	0	0	14	179	0	0	193	0	0	5	0	5	0	173	0	0	173	371	0
Total	0	0	0	0	0	40	702	0	0	742	0	0	25	0	25	0	783	3	0	786	1553	0
13:00	0	0	0	0	0	9	197	0	1	207	0	0	3	0	3	0	192	0	0	192	402	1
13:15	0	0	0	0	0	7	187	0	0	194	0	0	4	0	4	0	189	0	0	189	387	0
13:30	0	0	0	0	0	17	178	0	0	195	0	0	7	0	7	0	206	0	0	206	408	0
13:45	0	0	0	0	0	7	163	0	1	171	0	0	5	0	5	0	174	0	0	174	350	1
Total	0	0	0	0	0	40	725	0	2	767	0	0	19	0	19	0	761	0	0	761	1547	2
Grand Total	0	0	0	0	0	109	2153	0	3	2265	0	0	70	0	70	0	2337	6	0	2343	4678	3
Apprch %	0.0%	0.0%	0.0%	0.0%		4.8%	95.1%	0.0%	0.1%		0.0%	0.0%	100.0%	0.0%		0.0%	99.7%	0.3%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	46.0%	0.0%	0.1%	48.4%	0.0%	0.0%	1.5%	0.0%	1.5%	0.0%	50.0%	0.1%	0.0%	50.1%	100.0%	

NOON PEAK	Texaco Gas Station Dwy Southbound					S Bonnyview Rd Westbound					Texaco Gas Station Dwy Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	11	192	0	0	203	0	0	9	0	9	0	199	1	0	200	412
11:30	0	0	0	0	0	8	187	0	0	195	0	0	4	0	4	0	201	0	0	201	400
11:45	0	0	0	0	0	5	186	0	1	192	0	0	8	0	8	0	218	1	0	219	419
12:00	0	0	0	0	0	10	186	0	0	196	0	0	11	0	11	0	196	1	0	197	404
Total Volume	0	0	0	0	0	34	751	0	1	786	0	0	32	0	32	0	814	3	0	817	1635
% App Total	0.0%	0.0%	0.0%	0.0%		4.3%	95.5%	0.0%	0.1%		0.0%	0.0%	100.0%	0.0%		0.0%	99.6%	0.4%	0.0%		
PHF	.000	.000	.000	.000	.000	.773	.978	.000	.250	.968	.000	.000	.727	.000	.727	.000	.933	.750	.000	.933	.976

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-006 Texaco Gas Station Dwy & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Texaco Gas Station Dwy Southbound					S Bonnyview Rd Westbound					Texaco Gas Station Dwy Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	7	0	0	7	0	0	1	0	1	0	3	0	0	3	11	0
11:15	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	0	11	0	0	11	17	0
11:30	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	3	0	0	3	8	0
11:45	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12	0
Total	0	0	0	0	0	1	23	0	0	24	0	0	2	0	2	0	22	0	0	22	48	0
12:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	10	0
12:30	0	0	0	0	0	0	2	0	1	2	0	0	0	0	0	0	3	0	0	3	5	1
12:45	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	0	2	0	0	2	9	0
Total	0	0	0	0	0	0	14	0	1	14	0	0	1	0	1	0	11	0	0	11	26	1
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4	0
13:15	0	0	0	0	0	0	7	0	0	7	0	0	0	1	0	0	3	0	0	3	10	1
13:30	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	0	6	0	0	6	9	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	1	10	0	0	11	0	0	0	1	0	0	13	0	0	13	24	1
Grand Total	0	0	0	0	0	2	47	0	1	49	0	0	3	1	3	0	46	0	0	46	98	2
Apprch %	0.0%	0.0%	0.0%			4.1%	95.9%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	2.0%	48.0%	0.0%		50.0%	0.0%	0.0%	3.1%		3.1%	0.0%	46.9%	0.0%		46.9%	100.0%	

NOON PEAK	Texaco Gas Station Dwy Southbound					S Bonnyview Rd Westbound					Texaco Gas Station Dwy Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	0	11	0	0	11	17
11:30	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	3	0	0	3	8
11:45	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
12:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	0	0	1	18	0	0	19	0	0	1	0	1	0	19	0	0	19	39
% App Total	0.0%	0.0%	0.0%			5.3%	94.7%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.250	.643	.000		.679	.000	.000	.250		.250	.000	.432	.000		.432	.574

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-006 Texaco Gas Station Dwy & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Texaco Gas Station Dwy Southbound					S Bonnyview Rd Westbound					Texaco Gas Station Dwy Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	3	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	3	0
Grand Total	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	4	0	0	4	9	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	44.4%	0.0%		44.4%	0.0%	0.0%	11.1%		11.1%	0.0%	44.4%	0.0%		44.4%	100.0%	

NOON PEAK	Texaco Gas Station Dwy Southbound					S Bonnyview Rd Westbound					Texaco Gas Station Dwy Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.000	.500	.000		.500	.750

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-007 I-5 SB Ramps & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	I-5 SB Ramps Southbound					S Bonnyview Rd Westbound					I-5 SB Ramps Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	21	0	74	0	95	44	89	0	0	133	0	0	0	0	0	0	141	45	0	186	414	0
11:15	21	0	93	0	114	41	114	0	0	155	0	0	0	0	0	0	153	47	0	200	469	0
11:30	16	1	87	0	104	34	109	0	0	143	0	0	0	0	0	0	166	41	0	207	454	0
11:45	32	0	75	0	107	32	117	0	0	149	0	0	0	0	0	0	182	42	0	224	480	0
Total	90	1	329	0	420	151	429	0	0	580	0	0	0	0	0	0	642	175	0	817	1817	0
12:00	26	0	89	0	115	40	108	0	0	148	0	0	0	0	0	0	159	48	0	207	470	0
12:15	27	0	72	0	99	24	97	0	0	121	0	0	0	0	0	0	180	48	0	228	448	0
12:30	37	3	88	0	128	33	92	0	0	125	0	0	0	0	0	0	149	41	0	190	443	0
12:45	30	0	88	0	118	24	106	0	0	130	0	0	0	0	0	0	138	35	0	173	421	0
Total	120	3	337	0	460	121	403	0	0	524	0	0	0	0	0	0	626	172	0	798	1782	0
13:00	19	0	97	0	116	39	116	0	0	155	0	0	0	0	0	0	153	45	0	198	469	0
13:15	33	0	91	0	124	30	107	0	0	137	0	0	0	0	0	0	139	45	0	184	445	0
13:30	23	1	89	0	113	29	102	0	0	131	0	0	0	0	0	0	166	56	0	222	466	0
13:45	24	0	64	0	88	37	107	0	0	144	0	0	0	0	0	0	132	51	0	183	415	0
Total	99	1	341	0	441	135	432	0	0	567	0	0	0	0	0	0	590	197	0	787	1795	0
Grand Total	309	5	1007	0	1321	407	1264	0	0	1671	0	0	0	0	0	0	1858	544	0	2402	5394	0
Apprch %	23.4%	0.4%	76.2%	0.0%		24.4%	75.6%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	77.4%	22.6%	0.0%			
Total %	5.7%	0.1%	18.7%	0.0%	24.5%	7.5%	23.4%	0.0%	0.0%	31.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.4%	10.1%	0.0%	44.5%	100.0%	

NOON PEAK	I-5 SB Ramps Southbound					S Bonnyview Rd Westbound					I-5 SB Ramps Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	21	0	93	0	114	41	114	0	0	155	0	0	0	0	0	0	153	47	0	200	469
11:30	16	1	87	0	104	34	109	0	0	143	0	0	0	0	0	0	166	41	0	207	454
11:45	32	0	75	0	107	32	117	0	0	149	0	0	0	0	0	0	182	42	0	224	480
12:00	26	0	89	0	115	40	108	0	0	148	0	0	0	0	0	0	159	48	0	207	470
Total Volume	95	1	344	0	440	147	448	0	0	595	0	0	0	0	0	0	660	178	0	838	1873
% App Total	21.6%	0.2%	78.2%	0.0%		24.7%	75.3%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	78.8%	21.2%	0.0%		
PHF	.742	.250	.925	.000	.957	.896	.957	.000	.000	.960	.000	.000	.000	.000	.000	.000	.907	.927	.000	.935	.976

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-007 I-5 SB Ramps & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	I-5 SB Ramps Southbound					S Bonnyview Rd Westbound					I-5 SB Ramps Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	3	1	3	2	3	0	0	5	0	0	0	0	0	0	2	2	0	4	12	1
11:15	2	0	5	0	7	0	2	0	0	2	0	0	0	1	0	0	10	0	0	10	19	1
11:30	1	0	1	0	2	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	10	0
11:45	2	0	3	0	5	0	3	0	0	3	0	0	0	0	0	0	3	2	0	5	13	0
Total	5	0	12	1	17	3	11	0	0	14	0	0	0	1	0	0	19	4	0	23	54	2
12:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
12:15	1	0	3	1	4	0	1	0	0	1	0	0	0	0	0	0	4	2	0	6	11	1
12:30	0	0	2	1	2	1	0	0	0	1	0	0	0	0	0	0	3	0	0	3	6	1
12:45	2	0	2	0	4	0	4	0	0	4	0	0	0	0	0	0	2	1	0	3	11	0
Total	3	0	9	2	12	1	5	0	0	6	0	0	0	0	0	0	9	3	0	12	30	2
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	2	0	3	4	0
13:15	2	0	3	0	5	0	5	0	0	5	0	0	0	1	0	0	2	1	0	3	13	1
13:30	0	0	1	0	1	0	1	0	0	1	0	0	0	1	0	0	6	1	0	7	9	1
13:45	1	0	0	0	1	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	4	0
Total	3	0	4	0	7	2	7	0	0	9	0	0	0	2	0	0	10	4	0	14	30	2
Grand Total	11	0	25	3	36	6	23	0	0	29	0	0	0	3	0	0	38	11	0	49	114	6
Apprch %	30.6%	0.0%	69.4%			20.7%	79.3%	0.0%			0.0%	0.0%	0.0%			0.0%	77.6%	22.4%				
Total %	9.6%	0.0%	21.9%		31.6%	5.3%	20.2%	0.0%		25.4%	0.0%	0.0%	0.0%		0.0%	0.0%	33.3%	9.6%		43.0%	100.0%	

NOON PEAK	I-5 SB Ramps Southbound					S Bonnyview Rd Westbound					I-5 SB Ramps Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	2	0	5	0	7	0	2	0	0	2	0	0	0	1	0	0	10	0	0	10	19
11:30	1	0	1	0	2	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	10
11:45	2	0	3	0	5	0	3	0	0	3	0	0	0	0	0	0	3	2	0	5	13
12:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	5	0	11	0	16	1	8	0	0	9	0	0	0	1	0	0	17	2	0	19	44
% App Total	31.3%	0.0%	68.8%			11.1%	88.9%	0.0%			0.0%	0.0%	0.0%			0.0%	89.5%	10.5%			
PHF	.625	.000	.550		.571	.250	.667	.000		.563	.000	.000	.000		.000	.000	.425	.250		.475	.579

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-007 I-5 SB Ramps & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	I-5 SB Ramps Southbound					S Bonnyview Rd Westbound					I-5 SB Ramps Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3	0
Grand Total	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	44.4%	0.0%		44.4%	0.0%	0.0%	0.0%		0.0%	0.0%	55.6%	0.0%		55.6%	100.0%	

NOON PEAK	I-5 SB Ramps Southbound					S Bonnyview Rd Westbound					I-5 SB Ramps Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.000	.500	.000		.500	.750

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-008 I-5 NB Ramps & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	I-5 NB Ramps Southbound					S Bonnyview Rd Westbound					I-5 NB Ramps Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	0	0	0	0	0	0	102	42	0	144	38	0	45	0	83	98	62	0	0	160	387	0
11:15	0	0	0	0	0	0	108	38	0	146	45	0	38	0	83	88	82	0	0	170	399	0
11:30	0	0	0	0	0	0	102	39	0	141	45	1	38	0	84	81	105	0	0	186	411	0
11:45	0	0	0	0	0	0	105	36	0	141	43	1	41	0	85	101	106	0	0	207	433	0
Total	0	0	0	0	0	0	417	155	0	572	171	2	162	0	335	368	355	0	0	723	1630	0
12:00	0	0	0	0	0	0	107	29	0	136	39	2	44	0	85	102	88	0	0	190	411	0
12:15	0	0	0	0	0	0	80	31	0	111	45	0	33	0	78	107	92	0	0	199	388	0
12:30	0	0	0	0	0	0	90	34	0	124	32	1	41	0	74	98	88	0	0	186	384	0
12:45	0	0	0	0	0	0	80	33	0	113	46	0	46	0	92	94	78	0	0	172	377	0
Total	0	0	0	0	0	0	357	127	0	484	162	3	164	0	329	401	346	0	0	747	1560	0
13:00	0	0	0	0	0	0	90	42	0	132	58	0	43	0	101	74	101	0	0	175	408	0
13:15	0	0	0	0	0	0	101	31	0	132	39	2	35	0	76	86	83	0	0	169	377	0
13:30	0	0	0	0	0	0	95	35	0	130	36	0	50	0	86	99	95	0	0	194	410	0
13:45	0	0	0	0	0	0	110	36	0	146	33	0	48	0	81	99	64	0	0	163	390	0
Total	0	0	0	0	0	0	396	144	0	540	166	2	176	0	344	358	343	0	0	701	1585	0
Grand Total	0	0	0	0	0	0	1170	426	0	1596	499	7	502	0	1008	1127	1044	0	0	2171	4775	0
Apprch %	0.0%	0.0%	0.0%	0.0%		0.0%	73.3%	26.7%	0.0%		49.5%	0.7%	49.8%	0.0%		51.9%	48.1%	0.0%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.5%	8.9%	0.0%	33.4%	10.5%	0.1%	10.5%	0.0%	21.1%	23.6%	21.9%	0.0%	0.0%	45.5%	100.0%	

NOON PEAK	I-5 NB Ramps Southbound					S Bonnyview Rd Westbound					I-5 NB Ramps Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	108	38	0	146	45	0	38	0	83	88	82	0	0	170	399
11:30	0	0	0	0	0	0	102	39	0	141	45	1	38	0	84	81	105	0	0	186	411
11:45	0	0	0	0	0	0	105	36	0	141	43	1	41	0	85	101	106	0	0	207	433
12:00	0	0	0	0	0	0	107	29	0	136	39	2	44	0	85	102	88	0	0	190	411
Total Volume	0	0	0	0	0	0	422	142	0	564	172	4	161	0	337	372	381	0	0	753	1654
% App Total	0.0%	0.0%	0.0%	0.0%		0.0%	74.8%	25.2%	0.0%		51.0%	1.2%	47.8%	0.0%		49.4%	50.6%	0.0%	0.0%		
PHF	.000	.000	.000	.000	.000	.000	.977	.910	.000	.966	.956	.500	.915	.000	.991	.912	.899	.000	.000	.909	.955

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-008 I-5 NB Ramps & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	I-5 NB Ramps Southbound					S Bonnyview Rd Westbound					I-5 NB Ramps Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	1	0	0	3	0	0	3	2	0	0	0	2	1	1	0	0	2	7	1
11:15	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	7	0	0	9	11	0
11:30	0	0	0	0	0	0	1	1	0	2	2	0	1	1	3	0	6	0	0	6	11	1
11:45	0	0	0	1	0	0	2	1	0	3	2	0	0	0	2	1	3	0	0	4	9	1
Total	0	0	0	2	0	0	8	2	0	10	6	0	1	1	7	4	17	0	0	21	38	3
12:00	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	2	0	0	0	2	3	2
12:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	3	0	0	5	7	0
12:30	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	1	0	0	2	3	1
12:45	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	3	1	0	0	4	6	0
Total	0	0	0	0	0	0	2	0	0	2	4	0	0	3	4	8	5	0	0	13	19	3
13:00	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	5	0
13:15	0	0	0	0	0	0	3	0	0	3	1	1	1	0	3	2	2	0	0	4	10	0
13:30	0	0	0	0	0	0	1	1	0	2	0	0	2	1	2	4	1	0	0	5	9	1
13:45	0	0	0	0	0	0	1	0	0	1	1	0	1	0	2	3	1	0	0	4	7	0
Total	0	0	0	0	0	0	7	2	0	9	2	1	4	1	7	9	6	0	0	15	31	1
Grand Total	0	0	0	2	0	0	17	4	0	21	12	1	5	5	18	21	28	0	0	49	88	7
Apprch %	0.0%	0.0%	0.0%			0.0%	81.0%	19.0%			66.7%	5.6%	27.8%			42.9%	57.1%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	19.3%	4.5%		23.9%	13.6%	1.1%	5.7%		20.5%	23.9%	31.8%	0.0%		55.7%	100.0%	

NOON PEAK	I-5 NB Ramps Southbound					S Bonnyview Rd Westbound					I-5 NB Ramps Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	7	0	0	9	11
11:30	0	0	0	0	0	0	1	1	0	2	2	0	1	1	3	0	6	0	0	6	11
11:45	0	0	0	1	0	0	2	1	0	3	2	0	0	0	2	1	3	0	0	4	9
12:00	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	2	0	0	0	2	3
Total Volume	0	0	0	1	0	0	5	2	0	7	5	0	1	3	6	5	16	0	0	21	34
% App Total	0.0%	0.0%	0.0%			0.0%	71.4%	28.6%			83.3%	0.0%	16.7%			23.8%	76.2%	0.0%			
PHF	.000	.000	.000		.000	.000	.625	.500		.583	.625	.000	.250		.500	.625	.571	.000		.583	.773

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-008 I-5 NB Ramps & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	I-5 NB Ramps Southbound					S Bonnyview Rd Westbound					I-5 NB Ramps Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3	0
Grand Total	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	44.4%	0.0%		44.4%	0.0%	0.0%	0.0%		0.0%	0.0%	55.6%	0.0%		55.6%	100.0%	

NOON PEAK	I-5 NB Ramps Southbound					S Bonnyview Rd Westbound					I-5 NB Ramps Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.000	.500	.000		.500	.750

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-009 Churn Creek Rd & S Bonnyview Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Churn Creek Rd Southbound					S Bonnyview Rd Westbound					Churn Creek Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	13	2	44	0	59	0	98	13	0	111	1	1	1	0	3	49	58	0	0	107	280	0
11:15	15	0	54	0	69	1	94	11	0	106	0	0	0	0	0	42	74	0	0	116	291	0
11:30	15	0	59	0	74	0	83	16	0	99	0	1	0	0	1	47	83	1	0	131	305	0
11:45	12	2	37	0	51	0	90	17	0	107	2	2	0	0	4	68	81	1	0	150	312	0
Total	55	4	194	0	253	1	365	57	0	423	3	4	1	0	8	206	296	2	0	504	1188	0
12:00	20	2	54	0	76	0	90	22	0	112	1	0	1	0	2	49	89	1	0	139	329	0
12:15	22	0	55	2	79	0	61	20	0	81	1	1	0	0	2	47	72	0	0	119	281	2
12:30	18	0	43	0	61	1	77	24	0	102	0	0	1	0	1	50	77	1	0	128	292	0
12:45	16	1	54	0	71	1	72	14	0	87	0	1	1	0	2	55	81	1	0	137	297	0
Total	76	3	206	2	287	2	300	80	0	382	2	2	3	0	7	201	319	3	0	523	1199	2
13:00	21	1	47	0	69	0	66	21	0	87	2	1	1	0	4	50	85	1	0	136	296	0
13:15	15	0	53	0	68	0	74	22	0	96	1	0	0	0	1	50	74	1	0	125	290	0
13:30	28	0	52	0	80	0	77	16	0	93	0	0	0	0	0	57	88	0	0	145	318	0
13:45	22	1	58	0	81	1	86	28	0	115	2	0	0	0	2	42	75	1	0	118	316	0
Total	86	2	210	0	298	1	303	87	0	391	5	1	1	0	7	199	322	3	0	524	1220	0
Grand Total	217	9	610	2	838	4	968	224	0	1196	10	7	5	0	22	606	937	8	0	1551	3607	2
Apprch %	25.9%	1.1%	72.8%	0.2%		0.3%	80.9%	18.7%	0.0%		45.5%	31.8%	22.7%	0.0%		39.1%	60.4%	0.5%	0.0%			
Total %	6.0%	0.2%	16.9%	0.1%	23.2%	0.1%	26.8%	6.2%	0.0%	33.2%	0.3%	0.2%	0.1%	0.0%	0.6%	16.8%	26.0%	0.2%	0.0%	43.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					S Bonnyview Rd Westbound					Churn Creek Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	15	0	54	0	69	1	94	11	0	106	0	0	0	0	0	42	74	0	0	116	291
11:30	15	0	59	0	74	0	83	16	0	99	0	1	0	0	1	47	83	1	0	131	305
11:45	12	2	37	0	51	0	90	17	0	107	2	2	0	0	4	68	81	1	0	150	312
12:00	20	2	54	0	76	0	90	22	0	112	1	0	1	0	2	49	89	1	0	139	329
Total Volume	62	4	204	0	270	1	357	66	0	424	3	3	1	0	7	206	327	3	0	536	1237
% App Total	23.0%	1.5%	75.6%	0.0%		0.2%	84.2%	15.6%	0.0%		42.9%	42.9%	14.3%	0.0%		38.4%	61.0%	0.6%	0.0%		
PHF	.775	.500	.864	.000	.888	.250	.949	.750	.000	.946	.375	.375	.250	.000	.438	.757	.919	.750	.000	.893	.940

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-009 Churn Creek Rd & S Bonnyview Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Churn Creek Rd Southbound					S Bonnyview Rd Westbound					Churn Creek Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	1	1	1	0	3	0	2	0	0	2	0	0	1	0	1	0	1	0	0	1	7	0
11:15	0	0	2	0	2	0	1	0	1	1	0	0	0	1	0	3	4	0	0	7	10	2
11:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	6	0	0	7	9	0
11:45	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2	1
Total	1	1	3	1	5	0	6	0	1	6	0	0	1	1	1	5	11	0	0	16	28	3
12:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	1	0	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	3	1
12:30	0	0	0	3	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	1	2	4
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6	0
Total	0	0	1	4	1	0	4	1	0	5	0	0	0	1	0	0	6	0	0	6	12	5
13:00	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	0	1	2	1
13:15	0	0	0	2	0	0	1	0	1	1	0	0	0	0	0	0	2	0	0	2	3	3
13:30	1	0	0	1	1	0	2	0	0	2	0	0	0	0	0	2	2	0	0	4	7	1
13:45	0	0	1	0	1	0	1	0	0	1	0	0	0	1	0	0	3	0	0	3	5	1
Total	1	0	1	3	2	0	5	0	2	5	0	0	0	1	0	2	8	0	0	10	17	6
Grand Total	2	1	5	8	8	0	15	1	3	16	0	0	1	3	1	7	25	0	0	32	57	14
Apprch %	25.0%	12.5%	62.5%			0.0%	93.8%	6.3%			0.0%	0.0%	100.0%			21.9%	78.1%	0.0%				
Total %	3.5%	1.8%	8.8%		14.0%	0.0%	26.3%	1.8%		28.1%	0.0%	0.0%	1.8%		1.8%	12.3%	43.9%	0.0%		56.1%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					S Bonnyview Rd Westbound					Churn Creek Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	2	0	2	0	1	0	1	1	0	0	0	1	0	3	4	0	0	7	10
11:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	6	0	0	7	9
11:45	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2
12:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	3	1	3	0	4	0	1	4	0	0	0	1	0	5	10	0	0	15	22
% App Total	0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			33.3%	66.7%	0.0%			
PHF	.000	.000	.375		.375	.000	.500	.000		.500	.000	.000	.000		.000	.417	.417	.000		.536	.550

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-009 Churn Creek Rd & S Bonnyview Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Churn Creek Rd Southbound					S Bonnyview Rd Westbound					Churn Creek Rd Northbound					S Bonnyview Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2	0
12:00	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:30	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:45	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	3	0
Total	1	0	1	0	2	0	2	2	0	4	0	0	0	0	0	0	1	0	0	1	7	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	1	1	0	2	4	0
13:30	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	2	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	2	0	3	0	0	1	0	1	0	1	1	0	2	6	0
Grand Total	1	0	1	0	2	0	3	4	0	7	0	0	1	0	1	1	3	1	0	5	15	0
Apprch %	50.0%	0.0%	50.0%			0.0%	42.9%	57.1%			0.0%	0.0%	100.0%			20.0%	60.0%	20.0%				
Total %	6.7%	0.0%	6.7%		13.3%	0.0%	20.0%	26.7%		46.7%	0.0%	0.0%	6.7%		6.7%	6.7%	20.0%	6.7%		33.3%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					S Bonnyview Rd Westbound					Churn Creek Rd Northbound					S Bonnyview Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:00	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Total Volume	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	4
% App Total	100.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			50.0%	50.0%	0.0%			
PHF	.250	.000	.000		.250	.000	.250	.000		.250	.000	.000	.000		.000	.250	.250	.000		.500	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-010 Alrose Ln & Churn Creek Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Alrose Ln Southbound					Churn Creek Rd Westbound					Alrose Ln Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	1	0	33	0	34	0	72	5	0	77	2	1	1	0	4	16	50	1	2	69	184	2
11:15	3	0	24	0	27	0	80	8	0	88	0	0	0	0	0	11	78	1	0	90	205	0
11:30	3	0	18	0	21	0	77	3	0	80	3	0	1	0	4	18	82	0	0	100	205	0
11:45	3	0	16	0	19	0	89	7	0	96	4	0	0	0	4	15	77	0	0	92	211	0
Total	10	0	91	0	101	0	318	23	0	341	9	1	2	0	12	60	287	2	2	351	805	2
12:00	1	0	22	0	23	0	83	5	1	89	0	0	0	0	0	25	82	0	1	108	220	2
12:15	3	0	20	0	23	0	63	4	0	67	2	0	0	0	2	18	74	0	1	93	185	1
12:30	4	0	26	0	30	0	72	5	0	77	0	0	0	0	0	20	76	0	1	97	204	1
12:45	5	0	16	0	21	0	72	8	0	80	0	0	0	0	0	22	78	0	1	101	202	1
Total	13	0	84	0	97	0	290	22	1	313	2	0	0	0	2	85	310	0	4	399	811	5
13:00	6	0	20	0	26	0	63	9	0	72	0	0	0	0	0	24	84	0	0	108	206	0
13:15	5	0	28	0	33	0	72	5	0	77	0	0	0	0	0	12	75	0	0	87	197	0
13:30	4	0	28	0	32	0	66	6	0	72	0	0	0	0	0	35	78	0	1	114	218	1
13:45	4	0	32	0	36	0	80	3	0	83	0	0	0	0	0	15	81	0	1	97	216	1
Total	19	0	108	0	127	0	281	23	0	304	0	0	0	0	0	86	318	0	2	406	837	2
Grand Total	42	0	283	0	325	0	889	68	1	958	11	1	2	0	14	231	915	2	8	1156	2453	9
Apprch %	12.9%	0.0%	87.1%	0.0%		0.0%	92.8%	7.1%	0.1%		78.6%	7.1%	14.3%	0.0%		20.0%	79.2%	0.2%	0.7%			
Total %	1.7%	0.0%	11.5%	0.0%	13.2%	0.0%	36.2%	2.8%	0.0%	39.1%	0.4%	0.0%	0.1%	0.0%	0.6%	9.4%	37.3%	0.1%	0.3%	47.1%	100.0%	

NOON PEAK	Alrose Ln Southbound					Churn Creek Rd Westbound					Alrose Ln Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	3	0	24	0	27	0	80	8	0	88	0	0	0	0	0	11	78	1	0	90	205
11:30	3	0	18	0	21	0	77	3	0	80	3	0	1	0	4	18	82	0	0	100	205
11:45	3	0	16	0	19	0	89	7	0	96	4	0	0	0	4	15	77	0	0	92	211
12:00	1	0	22	0	23	0	83	5	1	89	0	0	0	0	0	25	82	0	1	108	220
Total Volume	10	0	80	0	90	0	329	23	1	353	7	0	1	0	8	69	319	1	1	390	841
% App Total	11.1%	0.0%	88.9%	0.0%		0.0%	93.2%	6.5%	0.3%		87.5%	0.0%	12.5%	0.0%		17.7%	81.8%	0.3%	0.3%		
PHF	.833	.000	.833	.000	.833	.000	.924	.719	.250	.919	.438	.000	.250	.000	.500	.690	.973	.250	.250	.903	.956

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

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File Name : 16-7587-010 Alrose Ln & Churn Creek Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Alrose Ln Southbound					Churn Creek Rd Westbound					Alrose Ln Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	2	1	0	3	6	0
11:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	5	0
11:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	8	0
11:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	0	0	0	0	0	6	0	0	6	0	1	0	0	1	0	12	1	0	13	20	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:15	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	4	0
12:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6	0
Total	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	12	0
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
13:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	3	0
13:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4	0
13:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4	0
Total	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	1	8	0	0	9	13	0
Grand Total	0	0	2	0	2	0	14	0	0	14	0	1	0	0	1	1	26	1	0	28	45	0
Apprch %	0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			3.6%	92.9%	3.6%				
Total %	0.0%	0.0%	4.4%		4.4%	0.0%	31.1%	0.0%		31.1%	0.0%	2.2%	0.0%		2.2%	2.2%	57.8%	2.2%		62.2%	100.0%	

NOON PEAK	Alrose Ln Southbound					Churn Creek Rd Westbound					Alrose Ln Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	5
11:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	8
11:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	11	0	0	11	15
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.500	.000		.500	.000	.000	.000		.000	.000	.458	.000		.458	.469

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-010 Alrose Ln & Churn Creek Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Alrose Ln Southbound					Churn Creek Rd Westbound					Alrose Ln Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
12:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Grand Total	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	1	1	0	0	2	6	0
Apprch %	0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			50.0%	50.0%	0.0%				
Total %	0.0%	0.0%	16.7%		16.7%	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	16.7%	16.7%	0.0%		33.3%	100.0%	

NOON PEAK	Alrose Ln Southbound					Churn Creek Rd Westbound					Alrose Ln Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			100.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.250	.000	.000		.250	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-011 Hartmeyer Ln & Churn Creek Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Hartmeyer Ln Southbound					Churn Creek Rd Westbound					Hartmeyer Ln Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	0	0	0	0	0	1	76	0	0	77	3	0	2	0	5	0	51	5	0	56	138	0
11:15	0	0	0	0	0	0	78	0	0	78	6	0	3	0	9	0	74	4	0	78	165	0
11:30	0	0	0	0	0	4	78	0	0	82	3	0	1	0	4	0	77	0	0	77	163	0
11:45	0	0	0	0	0	1	92	0	0	93	3	0	0	0	3	0	78	4	0	82	178	0
Total	0	0	0	0	0	6	324	0	0	330	15	0	6	0	21	0	280	13	0	293	644	0
12:00	0	0	0	0	0	0	91	0	0	91	2	0	0	0	2	0	86	1	0	87	180	0
12:15	0	0	0	0	0	2	56	0	0	58	7	0	1	0	8	0	78	4	0	82	148	0
12:30	0	0	0	0	0	0	75	0	0	75	0	0	0	0	0	0	77	2	0	79	154	0
12:45	0	0	0	0	0	0	77	0	0	77	2	0	0	0	2	0	82	1	0	83	162	0
Total	0	0	0	0	0	2	299	0	0	301	11	0	1	0	12	0	323	8	0	331	644	0
13:00	0	0	0	0	0	1	68	0	0	69	7	0	1	0	8	0	86	3	0	89	166	0
13:15	0	0	0	0	0	0	76	0	0	76	0	0	0	0	0	0	79	3	0	82	158	0
13:30	0	0	0	0	0	0	70	0	0	70	2	0	0	0	2	0	77	4	0	81	153	0
13:45	0	0	0	0	0	0	80	0	0	80	1	0	0	0	1	0	80	6	0	86	167	0
Total	0	0	0	0	0	1	294	0	0	295	10	0	1	0	11	0	322	16	0	338	644	0
Grand Total	0	0	0	0	0	9	917	0	0	926	36	0	8	0	44	0	925	37	0	962	1932	0
Apprch %	0.0%	0.0%	0.0%	0.0%		1.0%	99.0%	0.0%	0.0%		81.8%	0.0%	18.2%	0.0%		0.0%	96.2%	3.8%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	47.5%	0.0%	0.0%	47.9%	1.9%	0.0%	0.4%	0.0%	2.3%	0.0%	47.9%	1.9%	0.0%	49.8%	100.0%	

NOON PEAK	Hartmeyer Ln Southbound					Churn Creek Rd Westbound					Hartmeyer Ln Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	78	0	0	78	6	0	3	0	9	0	74	4	0	78	165
11:30	0	0	0	0	0	4	78	0	0	82	3	0	1	0	4	0	77	0	0	77	163
11:45	0	0	0	0	0	1	92	0	0	93	3	0	0	0	3	0	78	4	0	82	178
12:00	0	0	0	0	0	0	91	0	0	91	2	0	0	0	2	0	86	1	0	87	180
Total Volume	0	0	0	0	0	5	339	0	0	344	14	0	4	0	18	0	315	9	0	324	686
% App Total	0.0%	0.0%	0.0%	0.0%		1.5%	98.5%	0.0%	0.0%		77.8%	0.0%	22.2%	0.0%		0.0%	97.2%	2.8%	0.0%		
PHF	.000	.000	.000	.000	.000	.313	.921	.000	.000	.925	.583	.000	.333	.000	.500	.000	.916	.563	.000	.931	.953

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-011 Hartmeyer Ln & Churn Creek Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Hartmeyer Ln Southbound					Churn Creek Rd Westbound					Hartmeyer Ln Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	4	4	0
11:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	1	0	0	1	3	0
11:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	2	0
11:45	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	1	1	0	2	4	0
Total	0	0	0	0	0	0	1	0	0	1	4	0	0	0	4	0	5	3	0	8	13	0
12:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3	0	0	3	4	0
12:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	0	2	3	0
12:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
12:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	3	0
Total	0	0	0	0	0	0	2	0	0	2	2	0	0	0	2	0	6	2	0	8	12	0
13:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	3	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2	3	0
13:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2	0	3	4	0
13:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	3	4	0
Total	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	0	1	8	0	9	14	0
Grand Total	0	0	0	0	0	0	7	0	0	7	7	0	0	0	7	0	12	13	0	25	39	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			100.0%	0.0%	0.0%			0.0%	48.0%	52.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	17.9%	0.0%		17.9%	17.9%	0.0%	0.0%		17.9%	0.0%	30.8%	33.3%		64.1%	100.0%	

NOON PEAK	Hartmeyer Ln Southbound					Churn Creek Rd Westbound					Hartmeyer Ln Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	1	0	0	1	3
11:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	2
11:45	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	1	1	0	2	4
12:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3	0	0	3	4
Total Volume	0	0	0	0	0	0	1	0	0	1	5	0	0	0	5	0	6	1	0	7	13
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			100.0%	0.0%	0.0%			0.0%	85.7%	14.3%			
PHF	.000	.000	.000		.000	.000	.250	.000		.250	.625	.000	.000		.625	.000	.500	.250		.583	.813

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-011 Hartmeyer Ln & Churn Creek Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Hartmeyer Ln Southbound					Churn Creek Rd Westbound					Hartmeyer Ln Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
12:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	75.0%	0.0%		75.0%	0.0%	0.0%	0.0%		0.0%	0.0%	25.0%	0.0%		25.0%	100.0%	

NOON PEAK	Hartmeyer Ln Southbound					Churn Creek Rd Westbound					Hartmeyer Ln Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-012 Huntington Dr & Churn Creek Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Huntington Dr Southbound					Churn Creek Rd Westbound					Huntington Dr Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	1	0	4	0	5	2	79	3	0	84	0	0	2	0	2	2	50	2	0	54	145	0
11:15	4	1	2	0	7	1	71	6	0	78	0	2	1	0	3	3	73	0	0	76	164	0
11:30	2	0	3	1	6	0	81	2	0	83	1	1	0	0	2	2	77	3	0	82	173	1
11:45	5	0	2	0	7	0	88	2	1	91	0	0	0	0	0	6	70	1	0	77	175	1
Total	12	1	11	1	25	3	319	13	1	336	1	3	3	0	7	13	270	6	0	289	657	2
12:00	2	1	2	0	5	0	91	2	0	93	0	0	1	0	1	2	85	2	0	89	188	0
12:15	0	0	3	0	3	1	56	3	0	60	1	1	1	0	3	2	74	0	0	76	142	0
12:30	1	0	4	0	5	0	68	1	0	69	1	0	0	0	1	2	73	1	0	76	151	0
12:45	1	0	4	0	5	0	71	3	0	74	1	0	0	0	1	1	81	0	0	82	162	0
Total	4	1	13	0	18	1	286	9	0	296	3	1	2	0	6	7	313	3	0	323	643	0
13:00	0	0	0	1	1	1	65	2	0	68	2	0	1	0	3	3	79	5	1	88	160	2
13:15	1	0	4	0	5	0	69	0	0	69	2	2	0	0	4	5	74	1	0	80	158	0
13:30	1	0	4	0	5	1	63	1	0	65	2	0	0	0	2	3	72	2	0	77	149	0
13:45	2	0	2	0	4	0	74	1	0	75	0	1	0	0	1	1	75	3	0	79	159	0
Total	4	0	10	1	15	2	271	4	0	277	6	3	1	0	10	12	300	11	1	324	626	2
Grand Total	20	2	34	2	58	6	876	26	1	909	10	7	6	0	23	32	883	20	1	936	1926	4
Apprch %	34.5%	3.4%	58.6%	3.4%		0.7%	96.4%	2.9%	0.1%		43.5%	30.4%	26.1%	0.0%		3.4%	94.3%	2.1%	0.1%			
Total %	1.0%	0.1%	1.8%	0.1%	3.0%	0.3%	45.5%	1.3%	0.1%	47.2%	0.5%	0.4%	0.3%	0.0%	1.2%	1.7%	45.8%	1.0%	0.1%	48.6%	100.0%	

NOON PEAK	Huntington Dr Southbound					Churn Creek Rd Westbound					Huntington Dr Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	4	1	2	0	7	1	71	6	0	78	0	2	1	0	3	3	73	0	0	76	164
11:30	2	0	3	1	6	0	81	2	0	83	1	1	0	0	2	2	77	3	0	82	173
11:45	5	0	2	0	7	0	88	2	1	91	0	0	0	0	0	6	70	1	0	77	175
12:00	2	1	2	0	5	0	91	2	0	93	0	0	1	0	1	2	85	2	0	89	188
Total Volume	13	2	9	1	25	1	331	12	1	345	1	3	2	0	6	13	305	6	0	324	700
% App Total	52.0%	8.0%	36.0%	4.0%		0.3%	95.9%	3.5%	0.3%		16.7%	50.0%	33.3%	0.0%		4.0%	94.1%	1.9%	0.0%		
PHF	.650	.500	.750	.250	.893	.250	.909	.500	.250	.927	.250	.375	.500	.000	.500	.542	.897	.500	.000	.910	.931

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-012 Huntington Dr & Churn Creek Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Huntington Dr Southbound					Churn Creek Rd Westbound					Huntington Dr Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	3	0
11:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2	0
11:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	6	0
11:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Total	1	0	0	0	1	0	2	0	0	2	0	1	0	0	1	0	7	1	0	8	12	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5	0
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Grand Total	1	0	0	0	1	0	6	0	0	6	0	1	0	0	1	0	11	1	0	12	20	0
Apprch %	100.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			0.0%	91.7%	8.3%				
Total %	5.0%	0.0%	0.0%		5.0%	0.0%	30.0%	0.0%		30.0%	0.0%	5.0%	0.0%		5.0%	0.0%	55.0%	5.0%		60.0%	100.0%	

NOON PEAK	Huntington Dr Southbound					Churn Creek Rd Westbound					Huntington Dr Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
11:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	6
11:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	0	1	0	1	0	0	1	0	1	0	0	1	0	6	0	0	6	9
% App Total	100.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.250	.000	.000		.250	.000	.250	.000		.250	.000	.250	.000		.250	.000	.300	.000		.300	.375

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-012 Huntington Dr & Churn Creek Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Huntington Dr Southbound					Churn Creek Rd Westbound					Huntington Dr Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	75.0%	0.0%		75.0%	0.0%	0.0%	0.0%		0.0%	0.0%	25.0%	0.0%		25.0%	100.0%	

NOON PEAK	Huntington Dr Southbound					Churn Creek Rd Westbound					Huntington Dr Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-013 Victor Ave & Churn Creek Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Victor Ave Southbound					Churn Creek Rd Westbound					Victor Ave Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	12	0	32	0	44	0	56	8	0	64	0	0	0	0	0	15	37	0	0	52	160	0
11:15	10	0	34	0	44	0	50	9	0	59	0	0	0	0	0	27	49	0	0	76	179	0
11:30	9	0	21	0	30	0	63	12	0	75	0	0	0	0	0	23	55	0	0	78	183	0
11:45	10	0	30	0	40	0	55	6	0	61	0	0	0	0	0	23	53	0	0	76	177	0
Total	41	0	117	0	158	0	224	35	0	259	0	0	0	0	0	88	194	0	0	282	699	0
12:00	19	0	29	0	48	0	59	20	0	79	0	0	0	0	0	30	59	0	0	89	216	0
12:15	14	0	19	0	33	0	45	20	0	65	0	0	0	0	0	27	48	0	0	75	173	0
12:30	13	0	15	0	28	0	54	18	0	72	0	0	0	0	0	22	52	0	0	74	174	0
12:45	17	0	18	0	35	0	47	12	0	59	0	0	0	0	0	29	55	0	0	84	178	0
Total	63	0	81	0	144	0	205	70	0	275	0	0	0	0	0	108	214	0	0	322	741	0
13:00	17	0	26	0	43	0	57	13	0	70	0	0	0	0	0	21	60	0	0	81	194	0
13:15	11	0	16	0	27	0	49	17	0	66	0	0	0	0	0	27	48	0	0	75	168	0
13:30	11	0	28	0	39	0	36	11	0	47	0	0	0	0	0	23	46	0	1	70	156	1
13:45	8	0	20	0	28	0	51	12	0	63	0	0	0	0	0	25	55	0	0	80	171	0
Total	47	0	90	0	137	0	193	53	0	246	0	0	0	0	0	96	209	0	1	306	689	1
Grand Total	151	0	288	0	439	0	622	158	0	780	0	0	0	0	0	292	617	0	1	910	2129	1
Apprch %	34.4%	0.0%	65.6%	0.0%		0.0%	79.7%	20.3%	0.0%		0.0%	0.0%	0.0%	0.0%		32.1%	67.8%	0.0%	0.1%			
Total %	7.1%	0.0%	13.5%	0.0%	20.6%	0.0%	29.2%	7.4%	0.0%	36.6%	0.0%	0.0%	0.0%	0.0%	0.0%	13.7%	29.0%	0.0%	0.0%	42.7%	100.0%	

NOON PEAK	Victor Ave Southbound					Churn Creek Rd Westbound					Victor Ave Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	10	0	34	0	44	0	50	9	0	59	0	0	0	0	0	27	49	0	0	76	179
11:30	9	0	21	0	30	0	63	12	0	75	0	0	0	0	0	23	55	0	0	78	183
11:45	10	0	30	0	40	0	55	6	0	61	0	0	0	0	0	23	53	0	0	76	177
12:00	19	0	29	0	48	0	59	20	0	79	0	0	0	0	0	30	59	0	0	89	216
Total Volume	48	0	114	0	162	0	227	47	0	274	0	0	0	0	0	103	216	0	0	319	755
% App Total	29.6%	0.0%	70.4%	0.0%		0.0%	82.8%	17.2%	0.0%		0.0%	0.0%	0.0%	0.0%		32.3%	67.7%	0.0%	0.0%		
PHF	.632	.000	.838	.000	.844	.000	.901	.588	.000	.867	.000	.000	.000	.000	.000	.858	.915	.000	.000	.896	.874

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-013 Victor Ave & Churn Creek Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Victor Ave Southbound					Churn Creek Rd Westbound					Victor Ave Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2	0
11:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	5	0
11:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0
Total	1	0	1	0	2	0	1	0	0	1	0	0	0	0	0	2	6	0	0	8	11	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4	0
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
13:30	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	1	1	4
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	2	0	2	2	0	0	0	0	0	0	1	0	0	1	3	4
Grand Total	1	0	1	2	2	0	5	0	2	5	0	0	0	0	0	2	9	0	0	11	18	4
Apprch %	50.0%	0.0%	50.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			18.2%	81.8%	0.0%				
Total %	5.6%	0.0%	5.6%		11.1%	0.0%	27.8%	0.0%		27.8%	0.0%	0.0%	0.0%		0.0%	11.1%	50.0%	0.0%		61.1%	100.0%	

NOON PEAK	Victor Ave Southbound					Churn Creek Rd Westbound					Victor Ave Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	5
11:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	7	0	0	8	10
% App Total	50.0%	0.0%	50.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			12.5%	87.5%	0.0%			
PHF	.250	.000	.250		.500	.000	.000	.000		.000	.000	.000	.000		.000	.250	.350	.000		.400	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-013 Victor Ave & Churn Creek Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Victor Ave Southbound					Churn Creek Rd Westbound					Victor Ave Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	1	0	0	0	1	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	5	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0
Total	1	0	0	0	1	0	3	3	0	6	0	0	0	0	0	1	0	0	0	1	8	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2	0	0	0	2	0	3	3	0	6	0	0	0	0	0	1	0	0	0	1	9	0
Apprch %	100.0%	0.0%	0.0%			0.0%	50.0%	50.0%			0.0%	0.0%	0.0%			100.0%	0.0%	0.0%				
Total %	22.2%	0.0%	0.0%		22.2%	0.0%	33.3%	33.3%		66.7%	0.0%	0.0%	0.0%		0.0%	11.1%	0.0%	0.0%		11.1%	100.0%	

NOON PEAK	Victor Ave Southbound					Churn Creek Rd Westbound					Victor Ave Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2
Total Volume	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	3
% App Total	100.0%	0.0%	0.0%			0.0%	0.0%	100.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.250	.000	.000		.250	.000	.000	.250		.250	.000	.000	.000		.000	.000	.000	.000		.000	.375

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-014 Rancho Rd & Churn Creek Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Rancho Rd Southbound					Churn Creek Rd Westbound					Rancho Rd Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	5	0	51	0	56	0	13	6	0	19	0	0	0	0	0	29	20	0	0	49	124	0
11:15	4	0	45	0	49	0	11	1	0	12	0	0	0	0	0	44	17	0	1	62	123	1
11:30	5	0	56	0	61	0	18	1	0	19	0	0	0	0	0	48	14	0	2	64	144	2
11:45	6	0	45	0	51	0	17	6	0	23	0	0	0	0	0	38	24	0	0	62	136	0
Total	20	0	197	0	217	0	59	14	0	73	0	0	0	0	0	159	75	0	3	237	527	3
12:00	5	0	51	0	56	0	26	5	0	31	0	0	0	0	0	39	37	0	0	76	163	0
12:15	2	0	39	0	41	0	27	2	0	29	0	0	0	0	0	38	24	0	0	62	132	0
12:30	3	0	46	0	49	0	27	2	0	29	0	0	0	0	0	41	25	0	0	66	144	0
12:45	3	0	38	1	42	0	22	7	0	29	0	0	0	0	0	35	33	0	0	68	139	1
Total	13	0	174	1	188	0	102	16	0	118	0	0	0	0	0	153	119	0	0	272	578	1
13:00	3	0	44	0	47	0	22	3	0	25	0	0	0	0	0	38	37	0	1	76	148	1
13:15	6	0	45	0	51	0	20	5	0	25	0	0	0	0	0	37	25	0	0	62	138	0
13:30	5	0	32	0	37	0	16	6	0	22	0	0	0	0	0	26	27	0	0	53	112	0
13:45	6	0	37	0	43	0	29	10	0	39	0	0	0	0	0	41	24	0	0	65	147	0
Total	20	0	158	0	178	0	87	24	0	111	0	0	0	0	0	142	113	0	1	256	545	1
Grand Total	53	0	529	1	583	0	248	54	0	302	0	0	0	0	0	454	307	0	4	765	1650	5
Apprch %	9.1%	0.0%	90.7%	0.2%		0.0%	82.1%	17.9%	0.0%		0.0%	0.0%	0.0%	0.0%		59.3%	40.1%	0.0%	0.5%			
Total %	3.2%	0.0%	32.1%	0.1%	35.3%	0.0%	15.0%	3.3%	0.0%	18.3%	0.0%	0.0%	0.0%	0.0%	0.0%	27.5%	18.6%	0.0%	0.2%	46.4%	100.0%	

NOON PEAK	Rancho Rd Southbound					Churn Creek Rd Westbound					Rancho Rd Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	5	0	51	0	56	0	26	5	0	31	0	0	0	0	0	39	37	0	0	76	163
12:15	2	0	39	0	41	0	27	2	0	29	0	0	0	0	0	38	24	0	0	62	132
12:30	3	0	46	0	49	0	27	2	0	29	0	0	0	0	0	41	25	0	0	66	144
12:45	3	0	38	1	42	0	22	7	0	29	0	0	0	0	0	35	33	0	0	68	139
Total Volume	13	0	174	1	188	0	102	16	0	118	0	0	0	0	0	153	119	0	0	272	578
% App Total	6.9%	0.0%	92.6%	0.5%		0.0%	86.4%	13.6%	0.0%		0.0%	0.0%	0.0%	0.0%		56.3%	43.8%	0.0%	0.0%		
PHF	.650	.000	.853	.250	.839	.000	.944	.571	.000	.952	.000	.000	.000	.000	.000	.933	.804	.000	.000	.895	.887

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-014 Rancho Rd & Churn Creek Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Rancho Rd Southbound					Churn Creek Rd Westbound					Rancho Rd Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4	0
11:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0
Total	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	6	1	0	0	7	9	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:45	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Total	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	4	0
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Grand Total	1	0	3	0	4	0	2	0	0	2	0	0	0	0	0	7	3	0	0	10	16	0
Apprch %	25.0%	0.0%	75.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			70.0%	30.0%	0.0%				
Total %	6.3%	0.0%	18.8%		25.0%	0.0%	12.5%	0.0%		12.5%	0.0%	0.0%	0.0%		0.0%	43.8%	18.8%	0.0%		62.5%	100.0%	

NOON PEAK	Rancho Rd Southbound					Churn Creek Rd Westbound					Rancho Rd Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:45	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	4
% App Total	0.0%	0.0%	100.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			50.0%	50.0%	0.0%			
PHF	.000	.000	.250		.250	.000	.000	.000		.000	.000	.000	.000		.000	.250	.250	.000		.500	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-014 Rancho Rd & Churn Creek Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Rancho Rd Southbound					Churn Creek Rd Westbound					Rancho Rd Northbound					Churn Creek Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	0	0	0	1	5	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	1	0	0	0	1	7	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	1	1	0	0	2	8	0
Apprch %	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			50.0%	50.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	75.0%	0.0%		75.0%	0.0%	0.0%	0.0%		0.0%	12.5%	12.5%	0.0%		25.0%	100.0%	

NOON PEAK	Rancho Rd Southbound					Churn Creek Rd Westbound					Rancho Rd Northbound					Churn Creek Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	0	0	0	1	5
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	1	0	0	0	1	7
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			100.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.375	.000		.375	.000	.000	.000		.000	.250	.000	.000		.250	.350

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-015 Alta Mesa Dr & Rancho Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Alta Mesa Dr Southbound					Rancho Rd Westbound					Alta Mesa Dr Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	4	0	10	0	14	0	41	2	0	43	0	0	0	0	0	2	34	0	0	36	93	0
11:15	4	0	14	0	18	0	39	5	0	44	0	0	0	0	0	3	43	0	0	46	108	0
11:30	6	0	4	0	10	0	51	7	0	58	0	0	0	0	0	5	41	0	0	46	114	0
11:45	6	0	7	0	13	0	43	6	0	49	0	0	0	0	0	9	40	0	0	49	111	0
Total	20	0	35	0	55	0	174	20	0	194	0	0	0	0	0	19	158	0	0	177	426	0
12:00	7	0	6	0	13	0	51	3	0	54	0	0	0	0	0	2	34	0	0	36	103	0
12:15	4	0	2	0	6	0	39	7	0	46	0	0	0	0	0	1	43	0	0	44	96	0
12:30	2	0	4	0	6	0	40	3	0	43	0	0	0	0	0	5	32	0	0	37	86	0
12:45	1	0	6	0	7	0	36	7	0	43	0	0	0	0	0	10	36	0	1	47	97	1
Total	14	0	18	0	32	0	166	20	0	186	0	0	0	0	0	18	145	0	1	164	382	1
13:00	5	0	3	0	8	0	44	4	0	48	0	0	0	0	0	5	31	0	0	36	92	0
13:15	5	0	10	0	15	0	43	3	0	46	0	0	0	0	0	4	30	0	0	34	95	0
13:30	2	0	2	0	4	0	35	5	0	40	0	0	0	0	0	6	32	0	0	38	82	0
13:45	5	0	9	0	14	0	35	3	0	38	0	0	0	0	0	5	38	0	0	43	95	0
Total	17	0	24	0	41	0	157	15	0	172	0	0	0	0	0	20	131	0	0	151	364	0
Grand Total	51	0	77	0	128	0	497	55	0	552	0	0	0	0	0	57	434	0	1	492	1172	1
Apprch %	39.8%	0.0%	60.2%	0.0%		0.0%	90.0%	10.0%	0.0%		0.0%	0.0%	0.0%	0.0%		11.6%	88.2%	0.0%	0.2%			
Total %	4.4%	0.0%	6.6%	0.0%	10.9%	0.0%	42.4%	4.7%	0.0%	47.1%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%	37.0%	0.0%	0.1%	42.0%	100.0%	

NOON PEAK	Alta Mesa Dr Southbound					Rancho Rd Westbound					Alta Mesa Dr Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	4	0	14	0	18	0	39	5	0	44	0	0	0	0	0	3	43	0	0	46	108
11:30	6	0	4	0	10	0	51	7	0	58	0	0	0	0	0	5	41	0	0	46	114
11:45	6	0	7	0	13	0	43	6	0	49	0	0	0	0	0	9	40	0	0	49	111
12:00	7	0	6	0	13	0	51	3	0	54	0	0	0	0	0	2	34	0	0	36	103
Total Volume	23	0	31	0	54	0	184	21	0	205	0	0	0	0	0	19	158	0	0	177	436
% App Total	42.6%	0.0%	57.4%	0.0%		0.0%	89.8%	10.2%	0.0%		0.0%	0.0%	0.0%	0.0%		10.7%	89.3%	0.0%	0.0%		
PHF	.821	.000	.554	.000	.750	.000	.902	.750	.000	.884	.000	.000	.000	.000	.000	.528	.919	.000	.000	.903	.956

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-015 Alta Mesa Dr & Rancho Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Alta Mesa Dr Southbound					Rancho Rd Westbound					Alta Mesa Dr Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3	0
11:45	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	0	2	4	0
Total	1	0	0	0	1	0	1	1	0	2	0	0	0	0	0	1	5	0	0	6	9	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4	0
13:00	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
13:15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	1
Grand Total	2	0	0	1	2	0	4	1	0	5	0	0	0	0	0	1	7	0	0	8	15	1
Apprch %	100.0%	0.0%	0.0%			0.0%	80.0%	20.0%			0.0%	0.0%	0.0%			12.5%	87.5%	0.0%				
Total %	13.3%	0.0%	0.0%		13.3%	0.0%	26.7%	6.7%		33.3%	0.0%	0.0%	0.0%		0.0%	6.7%	46.7%	0.0%		53.3%	100.0%	

NOON PEAK	Alta Mesa Dr Southbound					Rancho Rd Westbound					Alta Mesa Dr Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
11:45	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	0	2	4
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	6	0	0	7	9
% App Total	100.0%	0.0%	0.0%			0.0%	0.0%	100.0%			0.0%	0.0%	0.0%			14.3%	85.7%	0.0%			
PHF	.250	.000	.000		.250	.000	.000	.250		.250	.000	.000	.000		.000	.250	.500	.000		.583	.563

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-015 Alta Mesa Dr & Rancho Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Alta Mesa Dr Southbound					Rancho Rd Westbound					Alta Mesa Dr Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Apprch %	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	100.0%	0.0%		100.0%	100.0%	

NOON PEAK	Alta Mesa Dr Southbound					Rancho Rd Westbound					Alta Mesa Dr Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-016 Shasta View Dr & Rancho Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Shasta View Dr Southbound					Rancho Rd Westbound					Shasta View Dr Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	13	0	16	0	29	0	23	7	0	30	0	0	0	0	0	13	24	0	0	37	96	0
11:15	12	0	11	0	23	0	28	13	0	41	0	0	0	0	0	17	29	0	0	46	110	0
11:30	11	0	22	0	33	0	37	6	0	43	0	0	0	0	0	14	24	0	0	38	114	0
11:45	11	0	14	0	25	0	26	7	0	33	0	0	0	0	0	15	30	0	0	45	103	0
Total	47	0	63	0	110	0	114	33	0	147	0	0	0	0	0	59	107	0	0	166	423	0
12:00	9	0	11	1	21	0	37	7	0	44	0	0	0	0	0	10	25	0	0	35	100	1
12:15	6	0	12	0	18	0	32	9	0	41	0	0	0	0	0	12	24	0	0	36	95	0
12:30	11	0	20	0	31	0	29	10	0	39	0	0	0	0	0	11	22	0	0	33	103	0
12:45	11	0	12	1	24	0	29	7	0	36	0	0	0	0	0	16	28	0	0	44	104	1
Total	37	0	55	2	94	0	127	33	0	160	0	0	0	0	0	49	99	0	0	148	402	2
13:00	5	0	9	0	14	0	39	10	0	49	0	0	0	0	0	11	20	0	0	31	94	0
13:15	4	0	15	0	19	0	30	6	0	36	0	0	0	0	0	11	21	0	0	32	87	0
13:30	4	0	9	0	13	0	29	9	0	38	0	0	0	0	0	8	19	0	0	27	78	0
13:45	7	0	12	1	20	0	23	8	0	31	0	0	0	0	0	12	22	0	0	34	85	1
Total	20	0	45	1	66	0	121	33	0	154	0	0	0	0	0	42	82	0	0	124	344	1
Grand Total	104	0	163	3	270	0	362	99	0	461	0	0	0	0	0	150	288	0	0	438	1169	3
Apprch %	38.5%	0.0%	60.4%	1.1%		0.0%	78.5%	21.5%	0.0%		0.0%	0.0%	0.0%	0.0%		34.2%	65.8%	0.0%	0.0%			
Total %	8.9%	0.0%	13.9%	0.3%	23.1%	0.0%	31.0%	8.5%	0.0%	39.4%	0.0%	0.0%	0.0%	0.0%	0.0%	12.8%	24.6%	0.0%	0.0%	37.5%	100.0%	

NOON PEAK	Shasta View Dr Southbound					Rancho Rd Westbound					Shasta View Dr Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	12	0	11	0	23	0	28	13	0	41	0	0	0	0	0	17	29	0	0	46	110
11:30	11	0	22	0	33	0	37	6	0	43	0	0	0	0	0	14	24	0	0	38	114
11:45	11	0	14	0	25	0	26	7	0	33	0	0	0	0	0	15	30	0	0	45	103
12:00	9	0	11	1	21	0	37	7	0	44	0	0	0	0	0	10	25	0	0	35	100
Total Volume	43	0	58	1	102	0	128	33	0	161	0	0	0	0	0	56	108	0	0	164	427
% App Total	42.2%	0.0%	56.9%	1.0%		0.0%	79.5%	20.5%	0.0%		0.0%	0.0%	0.0%	0.0%		34.1%	65.9%	0.0%	0.0%		
PHF	.896	.000	.659	.250	.773	.000	.865	.635	.000	.915	.000	.000	.000	.000	.000	.824	.900	.000	.000	.891	.936

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-016 Shasta View Dr & Rancho Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Shasta View Dr Southbound					Rancho Rd Westbound					Shasta View Dr Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4	4	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	5	0	0	7	8	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0
12:15	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Total	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	4	0
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	4	0
Grand Total	1	0	3	0	4	0	1	1	0	2	0	0	0	0	0	3	7	0	0	10	16	0
Apprch %	25.0%	0.0%	75.0%			0.0%	50.0%	50.0%			0.0%	0.0%	0.0%			30.0%	70.0%	0.0%				
Total %	6.3%	0.0%	18.8%		25.0%	0.0%	6.3%	6.3%		12.5%	0.0%	0.0%	0.0%		0.0%	18.8%	43.8%	0.0%		62.5%	100.0%	

NOON PEAK	Shasta View Dr Southbound					Rancho Rd Westbound					Shasta View Dr Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4	4
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total Volume	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	5	0	0	8	9
% App Total	100.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			37.5%	62.5%	0.0%			
PHF	.250	.000	.000		.250	.000	.000	.000		.000	.000	.000	.000		.000	.750	.417	.000		.500	.563

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-016 Shasta View Dr & Rancho Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Shasta View Dr Southbound					Rancho Rd Westbound					Shasta View Dr Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	3	0
Apprch %	100.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%				
Total %	33.3%	0.0%	0.0%		33.3%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	66.7%	0.0%		66.7%	100.0%	

NOON PEAK	Shasta View Dr Southbound					Rancho Rd Westbound					Shasta View Dr Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% App Total	100.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.250	.000	.000		.250	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-017 Airport Rd & Rancho Rd
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Airport Rd Southbound					Rancho Rd Westbound					Airport Rd Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	2	63	27	0	92	0	1	3	0	4	15	67	1	0	83	18	1	17	0	36	215	0
11:15	2	59	22	0	83	0	0	1	0	1	20	56	3	0	79	28	2	12	0	42	205	0
11:30	2	56	29	0	87	1	4	1	0	6	14	85	1	0	100	23	2	13	0	38	231	0
11:45	2	72	22	0	96	1	2	4	0	7	13	71	1	0	85	25	1	16	0	42	230	0
Total	8	250	100	0	358	2	7	9	0	18	62	279	6	0	347	94	6	58	0	158	881	0
12:00	4	63	24	0	91	0	0	1	0	1	16	51	4	0	71	16	2	21	0	39	202	0
12:15	1	51	23	0	75	1	2	1	0	4	15	67	2	0	84	19	2	11	0	32	195	0
12:30	3	61	28	0	92	3	1	1	0	5	20	76	1	0	97	11	0	17	0	28	222	0
12:45	0	66	23	0	89	1	0	5	0	6	17	50	0	0	67	18	3	14	0	35	197	0
Total	8	241	98	0	347	5	3	8	0	16	68	244	7	0	319	64	7	63	0	134	816	0
13:00	1	60	33	0	94	1	1	1	0	3	15	72	1	0	88	15	0	13	0	28	213	0
13:15	0	50	23	0	73	1	5	2	0	8	14	55	0	0	69	15	0	8	0	23	173	0
13:30	2	43	23	0	68	1	1	0	0	2	13	65	2	0	80	13	4	6	0	23	173	0
13:45	1	59	16	0	76	3	0	0	0	3	16	66	2	0	84	16	1	18	0	35	198	0
Total	4	212	95	0	311	6	7	3	0	16	58	258	5	0	321	59	5	45	0	109	757	0
Grand Total	20	703	293	0	1016	13	17	20	0	50	188	781	18	0	987	217	18	166	0	401	2454	0
Apprch %	2.0%	69.2%	28.8%	0.0%		26.0%	34.0%	40.0%	0.0%		19.0%	79.1%	1.8%	0.0%		54.1%	4.5%	41.4%	0.0%			
Total %	0.8%	28.6%	11.9%	0.0%	41.4%	0.5%	0.7%	0.8%	0.0%	2.0%	7.7%	31.8%	0.7%	0.0%	40.2%	8.8%	0.7%	6.8%	0.0%	16.3%	100.0%	

NOON PEAK	Airport Rd Southbound					Rancho Rd Westbound					Airport Rd Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:00 to 12:00																					
Peak Hour For Entire Intersection Begins at 11:00																					
11:00	2	63	27	0	92	0	1	3	0	4	15	67	1	0	83	18	1	17	0	36	215
11:15	2	59	22	0	83	0	0	1	0	1	20	56	3	0	79	28	2	12	0	42	205
11:30	2	56	29	0	87	1	4	1	0	6	14	85	1	0	100	23	2	13	0	38	231
11:45	2	72	22	0	96	1	2	4	0	7	13	71	1	0	85	25	1	16	0	42	230
Total Volume	8	250	100	0	358	2	7	9	0	18	62	279	6	0	347	94	6	58	0	158	881
% App Total	2.2%	69.8%	27.9%	0.0%		11.1%	38.9%	50.0%	0.0%		17.9%	80.4%	1.7%	0.0%		59.5%	3.8%	36.7%	0.0%		
PHF	1.000	.868	.862	.000	.932	.500	.438	.563	.000	.643	.775	.821	.500	.000	.868	.839	.750	.853	.000	.940	.953

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-017 Airport Rd & Rancho Rd
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Airport Rd Southbound					Rancho Rd Westbound					Airport Rd Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:15	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	6	0
11:30	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	1	1	1	1	3	6	1
11:45	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	5	0
Total	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	3	1	2	1	6	18	1
12:00	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0
12:15	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2	0
12:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
12:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	2	0	0	2	0	0	0	0	0	1	3	2	0	6	0	0	0	0	0	8	0
13:00	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0
13:15	0	1	1	0	2	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	5	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0
13:45	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4	0	0	1	0	1	5	0
Total	0	3	2	0	5	0	0	0	0	0	1	5	0	0	6	1	0	3	0	4	15	0
Grand Total	0	10	2	0	12	0	0	0	0	0	2	15	2	0	19	4	1	5	1	10	41	1
Apprch %	0.0%	83.3%	16.7%			0.0%	0.0%	0.0%			10.5%	78.9%	10.5%			40.0%	10.0%	50.0%				
Total %	0.0%	24.4%	4.9%		29.3%	0.0%	0.0%	0.0%		0.0%	4.9%	36.6%	4.9%		46.3%	9.8%	2.4%	12.2%		24.4%	100.0%	

NOON PEAK	Airport Rd Southbound					Rancho Rd Westbound					Airport Rd Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:00 to 12:00																					
Peak Hour For Entire Intersection Begins at 11:00																					
11:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	6
11:30	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	1	1	1	1	3	6
11:45	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	5
Total Volume	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	3	1	2	1	6	18
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			50.0%	16.7%	33.3%			
PHF	.000	.625	.000		.625	.000	.000	.000		.000	.000	.438	.000		.438	.375	.250	.500		.500	.750

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-017 Airport Rd & Rancho Rd
Date : 9/10/2016

Bank 2 Count = Bikes

	Airport Rd Southbound					Rancho Rd Westbound					Airport Rd Northbound					Rancho Rd Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	2	0	0	2	0	0	0	0	0	2	1	1	0	4	0	0	0	0	0	6	0
11:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	3	4	0
Total	0	2	0	0	2	0	1	0	0	1	2	1	1	0	4	0	0	4	0	4	11	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	2	0	0	2	0	1	0	0	1	2	1	1	0	4	0	0	4	0	4	11	0
Apprch %	0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			50.0%	25.0%	25.0%			0.0%	0.0%	100.0%				
Total %	0.0%	18.2%	0.0%		18.2%	0.0%	9.1%	0.0%		9.1%	18.2%	9.1%	9.1%		36.4%	0.0%	0.0%	36.4%		36.4%	100.0%	

NOON PEAK	Airport Rd Southbound					Rancho Rd Westbound					Airport Rd Northbound					Rancho Rd Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:00 to 12:00																					
Peak Hour For Entire Intersection Begins at 11:00																					
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	2	0	0	2	0	0	0	0	0	2	1	1	0	4	0	0	0	0	0	6
11:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	3	4
Total Volume	0	2	0	0	2	0	1	0	0	1	2	1	1	0	4	0	0	4	0	4	11
% App Total	0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			50.0%	25.0%	25.0%			0.0%	0.0%	100.0%			
PHF	.000	.250	.000		.250	.000	.250	.000		.250	.250	.250	.250		.250	.000	.000	.333		.333	.458

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-018 Bechelli Ln & Blue Shield Dwy
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Bechelli Ln Southbound					Blue Shield Dwy Westbound					Bechelli Ln Northbound					Blue Shield Dwy Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	0	49	0	0	49	0	0	0	0	0	1	43	0	0	44	0	0	0	0	0	93	0
11:15	0	65	0	0	65	0	0	0	0	0	0	55	0	0	55	0	0	0	0	0	120	0
11:30	0	56	1	0	57	0	0	0	0	0	1	51	0	0	52	0	0	2	0	2	111	0
11:45	0	64	0	0	64	0	0	0	0	0	1	64	0	0	65	1	0	0	0	1	130	0
Total	0	234	1	0	235	0	0	0	0	0	3	213	0	0	216	1	0	2	0	3	454	0
12:00	0	60	1	0	61	0	0	0	0	0	2	54	0	0	56	4	0	3	0	7	124	0
12:15	0	59	0	0	59	0	0	0	0	0	1	36	0	0	37	1	0	2	0	3	99	0
12:30	0	54	0	0	54	0	0	0	0	0	0	58	0	0	58	0	0	1	0	1	113	0
12:45	0	64	0	0	64	0	0	0	0	0	0	67	0	0	67	1	0	2	0	3	134	0
Total	0	237	1	0	238	0	0	0	0	0	3	215	0	0	218	6	0	8	0	14	470	0
13:00	0	64	1	0	65	0	0	0	0	0	0	49	0	0	49	0	0	1	0	1	115	0
13:15	0	58	1	0	59	0	0	0	0	0	0	44	0	0	44	2	0	0	0	2	105	0
13:30	0	74	0	0	74	0	0	0	0	0	0	47	0	0	47	1	0	0	0	1	122	0
13:45	0	56	2	0	58	0	0	0	0	0	0	48	0	0	48	2	0	0	0	2	108	0
Total	0	252	4	0	256	0	0	0	0	0	0	188	0	0	188	5	0	1	0	6	450	0
Grand Total	0	723	6	0	729	0	0	0	0	0	6	616	0	0	622	12	0	11	0	23	1374	0
Apprch %	0.0%	99.2%	0.8%	0.0%		0.0%	0.0%	0.0%	0.0%		1.0%	99.0%	0.0%	0.0%		52.2%	0.0%	47.8%	0.0%			
Total %	0.0%	52.6%	0.4%	0.0%	53.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	44.8%	0.0%	0.0%	45.3%	0.9%	0.0%	0.8%	0.0%	1.7%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Blue Shield Dwy Westbound					Bechelli Ln Northbound					Blue Shield Dwy Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	65	0	0	65	0	0	0	0	0	0	55	0	0	55	0	0	0	0	0	120
11:30	0	56	1	0	57	0	0	0	0	0	1	51	0	0	52	0	0	2	0	2	111
11:45	0	64	0	0	64	0	0	0	0	0	1	64	0	0	65	1	0	0	0	1	130
12:00	0	60	1	0	61	0	0	0	0	0	2	54	0	0	56	4	0	3	0	7	124
Total Volume	0	245	2	0	247	0	0	0	0	0	4	224	0	0	228	5	0	5	0	10	485
% App Total	0.0%	99.2%	0.8%	0.0%		0.0%	0.0%	0.0%	0.0%		1.8%	98.2%	0.0%	0.0%		50.0%	0.0%	50.0%	0.0%		
PHF	.000	.942	.500	.000	.950	.000	.000	.000	.000	.000	.500	.875	.000	.000	.877	.313	.000	.417	.000	.357	.933

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-018 Bechelli Ln & Blue Shield Dwy
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Bechelli Ln Southbound					Blue Shield Dwy Westbound					Bechelli Ln Northbound					Blue Shield Dwy Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	1
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	2	1
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
12:15	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	1	0	4	1
13:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	3	1
Grand Total	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	0	0	0	3	0	9	3
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	44.4%	0.0%		44.4%	0.0%	0.0%	0.0%		0.0%	0.0%	55.6%	0.0%		55.6%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Blue Shield Dwy Westbound					Bechelli Ln Northbound					Blue Shield Dwy Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Total Volume	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-018 Bechelli Ln & Blue Shield Dwy
Date : 9/10/2016

Bank 2 Count = Bikes

	Bechelli Ln Southbound					Blue Shield Dwy Westbound					Bechelli Ln Northbound					Blue Shield Dwy Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Blue Shield Dwy Westbound					Bechelli Ln Northbound					Blue Shield Dwy Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-019 Bechelli Ln & Chinook Dr
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Bechelli Ln Southbound					Chinook Dr Westbound					Bechelli Ln Northbound					Chinook Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	1	47	0	0	48	2	0	2	0	4	0	36	7	0	43	0	0	0	0	0	95	0
11:15	0	60	0	0	60	3	0	2	0	5	0	49	5	0	54	0	0	0	0	0	119	0
11:30	0	55	0	0	55	4	0	0	0	4	0	50	3	0	53	0	0	0	0	0	112	0
11:45	2	57	0	0	59	4	0	4	0	8	0	60	4	0	64	0	0	0	0	0	131	0
Total	3	219	0	0	222	13	0	8	0	21	0	195	19	0	214	0	0	0	0	0	457	0
12:00	2	62	0	0	64	0	0	0	0	0	0	56	1	0	57	0	0	0	0	0	121	0
12:15	1	58	0	0	59	2	0	0	0	2	0	38	2	0	40	0	0	0	0	0	101	0
12:30	4	52	0	0	56	2	0	3	0	5	0	55	2	0	57	0	0	0	0	0	118	0
12:45	2	56	0	1	59	6	0	0	0	6	0	65	0	0	65	0	0	0	0	0	130	1
Total	9	228	0	1	238	10	0	3	0	13	0	214	5	0	219	0	0	0	0	0	470	1
13:00	1	64	0	0	65	2	0	0	0	2	0	49	2	0	51	0	0	0	0	0	118	0
13:15	2	52	0	0	54	6	0	1	0	7	0	45	2	0	47	0	0	0	0	0	108	0
13:30	1	70	0	0	71	3	0	1	0	4	0	43	4	0	47	0	0	0	0	0	122	0
13:45	3	59	0	0	62	1	0	0	0	1	0	49	2	0	51	0	0	0	0	0	114	0
Total	7	245	0	0	252	12	0	2	0	14	0	186	10	0	196	0	0	0	0	0	462	0
Grand Total	19	692	0	1	712	35	0	13	0	48	0	595	34	0	629	0	0	0	0	0	1389	1
Apprch %	2.7%	97.2%	0.0%	0.1%		72.9%	0.0%	27.1%	0.0%		0.0%	94.6%	5.4%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	1.4%	49.8%	0.0%	0.1%	51.3%	2.5%	0.0%	0.9%	0.0%	3.5%	0.0%	42.8%	2.4%	0.0%	45.3%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Chinook Dr Westbound					Bechelli Ln Northbound					Chinook Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	60	0	0	60	3	0	2	0	5	0	49	5	0	54	0	0	0	0	0	119
11:30	0	55	0	0	55	4	0	0	0	4	0	50	3	0	53	0	0	0	0	0	112
11:45	2	57	0	0	59	4	0	4	0	8	0	60	4	0	64	0	0	0	0	0	131
12:00	2	62	0	0	64	0	0	0	0	0	0	56	1	0	57	0	0	0	0	0	121
Total Volume	4	234	0	0	238	11	0	6	0	17	0	215	13	0	228	0	0	0	0	0	483
% App Total	1.7%	98.3%	0.0%	0.0%		64.7%	0.0%	35.3%	0.0%		0.0%	94.3%	5.7%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.500	.944	.000	.000	.930	.688	.000	.375	.000	.531	.000	.896	.650	.000	.891	.000	.000	.000	.000	.000	.922

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-019 Bechelli Ln & Chinook Dr
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Bechelli Ln Southbound					Chinook Dr Westbound					Bechelli Ln Northbound					Chinook Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4	0
13:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
13:30	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	2	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	1	0	0	1	1	0	0	1	0	1	0	0	0	0	0	3	1
Grand Total	0	3	0	0	3	1	0	0	1	1	0	3	2	0	5	0	0	0	0	0	9	1
Apprch %	0.0%	100.0%	0.0%			100.0%	0.0%	0.0%			0.0%	60.0%	40.0%			0.0%	0.0%	0.0%				
Total %	0.0%	33.3%	0.0%		33.3%	11.1%	0.0%	0.0%		11.1%	0.0%	33.3%	22.2%		55.6%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Chinook Dr Westbound					Bechelli Ln Northbound					Chinook Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-019 Bechelli Ln & Chinook Dr
Date : 9/10/2016

Bank 2 Count = Bikes

	Bechelli Ln Southbound					Chinook Dr Westbound					Bechelli Ln Northbound					Chinook Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
Total	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4	0
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Chinook Dr Westbound					Bechelli Ln Northbound					Chinook Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total Volume	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.500	.000		.500	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.375

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-020 Bechelli Ln & Rivercrest Pkwy
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Bechelli Ln Southbound					Rivercrest Pkwy Westbound					Bechelli Ln Northbound					Rivercrest Pkwy Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	5	44	0	0	49	1	0	8	0	9	0	34	4	0	38	0	0	0	0	0	96	0
11:15	6	63	0	0	69	2	0	8	0	10	0	52	1	0	53	0	0	0	0	0	132	0
11:30	13	48	0	0	61	3	0	10	0	13	0	46	2	0	48	0	0	0	0	0	122	0
11:45	4	57	0	0	61	4	0	7	0	11	0	61	4	0	65	0	0	0	0	0	137	0
Total	28	212	0	0	240	10	0	33	0	43	0	193	11	0	204	0	0	0	0	0	487	0
12:00	6	65	0	0	71	0	0	5	0	5	0	54	2	0	56	0	0	0	0	0	132	0
12:15	9	57	0	0	66	2	0	4	0	6	0	36	2	0	38	0	0	0	0	0	110	0
12:30	6	54	0	0	60	3	0	3	0	6	0	58	1	0	59	0	0	0	0	0	125	0
12:45	4	56	0	0	60	4	0	7	0	11	0	58	8	0	66	0	0	0	0	0	137	0
Total	25	232	0	0	257	9	0	19	0	28	0	206	13	0	219	0	0	0	0	0	504	0
13:00	7	60	0	0	67	4	0	2	0	6	0	43	5	0	48	0	0	0	0	0	121	0
13:15	4	54	0	0	58	3	0	3	0	6	0	37	6	0	43	0	0	0	0	0	107	0
13:30	6	63	0	0	69	5	0	6	0	11	0	41	4	0	45	0	0	0	0	0	125	0
13:45	7	59	0	0	66	5	0	9	0	14	0	42	7	0	49	0	0	0	0	0	129	0
Total	24	236	0	0	260	17	0	20	0	37	0	163	22	0	185	0	0	0	0	0	482	0
Grand Total	77	680	0	0	757	36	0	72	0	108	0	562	46	0	608	0	0	0	0	0	1473	0
Apprch %	10.2%	89.8%	0.0%	0.0%		33.3%	0.0%	66.7%	0.0%		0.0%	92.4%	7.6%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	5.2%	46.2%	0.0%	0.0%	51.4%	2.4%	0.0%	4.9%	0.0%	7.3%	0.0%	38.2%	3.1%	0.0%	41.3%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Rivercrest Pkwy Westbound					Bechelli Ln Northbound					Rivercrest Pkwy Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	6	63	0	0	69	2	0	8	0	10	0	52	1	0	53	0	0	0	0	0	132
11:30	13	48	0	0	61	3	0	10	0	13	0	46	2	0	48	0	0	0	0	0	122
11:45	4	57	0	0	61	4	0	7	0	11	0	61	4	0	65	0	0	0	0	0	137
12:00	6	65	0	0	71	0	0	5	0	5	0	54	2	0	56	0	0	0	0	0	132
Total Volume	29	233	0	0	262	9	0	30	0	39	0	213	9	0	222	0	0	0	0	0	523
% App Total	11.1%	88.9%	0.0%	0.0%		23.1%	0.0%	76.9%	0.0%		0.0%	95.9%	4.1%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.558	.896	.000	.000	.923	.563	.000	.750	.000	.750	.000	.873	.563	.000	.854	.000	.000	.000	.000	.000	.954

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-020 Bechelli Ln & Rivercrest Pkwy
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Bechelli Ln Southbound					Rivercrest Pkwy Westbound					Bechelli Ln Northbound					Rivercrest Pkwy Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1
12:15	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	1	1	1	0	3	0	0	3	0	0	0	0	0	5	1
13:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
Grand Total	0	3	0	0	3	0	0	1	2	1	0	3	0	0	3	0	0	0	0	0	7	2
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	42.9%	0.0%		42.9%	0.0%	0.0%	14.3%		14.3%	0.0%	42.9%	0.0%		42.9%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Rivercrest Pkwy Westbound					Bechelli Ln Northbound					Rivercrest Pkwy Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.000	.250		.250	.000	.000	.000		.000	.000	.000	.000		.000	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-020 Bechelli Ln & Rivercrest Pkwy
Date : 9/10/2016

Bank 2 Count = Bikes

	Bechelli Ln Southbound					Rivercrest Pkwy Westbound					Bechelli Ln Northbound					Rivercrest Pkwy Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0
Total	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	3	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4	0
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	50.0%	50.0%			0.0%	0.0%	0.0%				
Total %	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	0.0%	25.0%	25.0%		50.0%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Rivercrest Pkwy Westbound					Bechelli Ln Northbound					Rivercrest Pkwy Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.500	.000		.500	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-021 Bechelli Ln & Loma Vista Dr
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Bechelli Ln Southbound					Loma Vista Dr Westbound					Bechelli Ln Northbound					Loma Vista Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	8	47	0	0	55	8	0	5	0	13	0	36	5	0	41	0	1	0	0	1	110	0
11:15	7	59	0	0	66	9	1	8	0	18	2	52	4	0	58	1	0	0	0	1	143	0
11:30	5	49	1	0	55	12	0	4	0	16	1	48	7	0	56	1	0	0	0	1	128	0
11:45	8	50	1	0	59	7	0	5	0	12	0	61	6	0	67	1	0	1	0	2	140	0
Total	28	205	2	0	235	36	1	22	0	59	3	197	22	0	222	3	1	1	0	5	521	0
12:00	4	63	2	0	69	4	1	7	0	12	0	59	4	0	63	2	1	2	0	5	149	0
12:15	3	63	1	0	67	6	0	3	0	9	1	36	2	0	39	1	0	1	0	2	117	0
12:30	6	54	4	2	66	3	0	4	0	7	1	53	5	1	60	1	0	0	0	1	134	3
12:45	5	57	0	0	62	8	0	7	0	15	0	58	4	0	62	0	0	1	0	1	140	0
Total	18	237	7	2	264	21	1	21	0	43	2	206	15	1	224	4	1	4	0	9	540	3
13:00	4	52	0	0	56	9	0	3	0	12	3	40	3	0	46	1	0	0	0	1	115	0
13:15	4	53	1	0	58	6	1	6	0	13	1	35	3	0	39	2	0	1	0	3	113	0
13:30	5	52	1	2	60	7	0	14	0	21	2	45	3	0	50	2	2	1	0	5	136	2
13:45	5	63	1	1	70	6	0	5	0	11	1	49	3	0	53	2	1	1	0	4	138	1
Total	18	220	3	3	244	28	1	28	0	57	7	169	12	0	188	7	3	3	0	13	502	3
Grand Total	64	662	12	5	743	85	3	71	0	159	12	572	49	1	634	14	5	8	0	27	1563	6
Apprch %	8.6%	89.1%	1.6%	0.7%		53.5%	1.9%	44.7%	0.0%		1.9%	90.2%	7.7%	0.2%		51.9%	18.5%	29.6%	0.0%			
Total %	4.1%	42.4%	0.8%	0.3%	47.5%	5.4%	0.2%	4.5%	0.0%	10.2%	0.8%	36.6%	3.1%	0.1%	40.6%	0.9%	0.3%	0.5%	0.0%	1.7%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Loma Vista Dr Westbound					Bechelli Ln Northbound					Loma Vista Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	7	59	0	0	66	9	1	8	0	18	2	52	4	0	58	1	0	0	0	1	143
11:30	5	49	1	0	55	12	0	4	0	16	1	48	7	0	56	1	0	0	0	1	128
11:45	8	50	1	0	59	7	0	5	0	12	0	61	6	0	67	1	0	1	0	2	140
12:00	4	63	2	0	69	4	1	7	0	12	0	59	4	0	63	2	1	2	0	5	149
Total Volume	24	221	4	0	249	32	2	24	0	58	3	220	21	0	244	5	1	3	0	9	560
% App Total	9.6%	88.8%	1.6%	0.0%		55.2%	3.4%	41.4%	0.0%		1.2%	90.2%	8.6%	0.0%		55.6%	11.1%	33.3%	0.0%		
PHF	.750	.877	.500	.000	.902	.667	.500	.750	.000	.806	.375	.902	.750	.000	.910	.625	.250	.375	.000	.450	.940

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-021 Bechelli Ln & Loma Vista Dr
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Bechelli Ln Southbound					Loma Vista Dr Westbound					Bechelli Ln Northbound					Loma Vista Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0
11:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	1	1	0	0	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	0
12:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	1
12:15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
12:45	1	0	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3	0
Total	1	1	0	0	2	0	0	1	1	1	0	3	0	0	3	0	0	0	0	0	6	1
13:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	1
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1
13:45	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Total	1	1	0	0	2	0	0	1	1	1	0	1	0	1	1	0	0	0	0	0	4	2
Grand Total	3	3	0	0	6	0	0	3	2	3	0	4	0	1	4	0	0	0	0	0	13	3
Apprch %	50.0%	50.0%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	23.1%	23.1%	0.0%		46.2%	0.0%	0.0%	23.1%		23.1%	0.0%	30.8%	0.0%		30.8%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Loma Vista Dr Westbound					Bechelli Ln Northbound					Loma Vista Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
11:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1
Total Volume	1	1	0	0	2	0	0	1	1	1	0	1	0	0	1	0	0	0	0	0	4
% App Total	50.0%	50.0%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.250	.250	.000		.500	.000	.000	.250		.250	.000	.250	.000		.250	.000	.000	.000		.000	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-021 Bechelli Ln & Loma Vista Dr
Date : 9/10/2016

Bank 2 Count = Bikes

	Bechelli Ln Southbound					Loma Vista Dr Westbound					Bechelli Ln Northbound					Loma Vista Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
Apprch %	100.0%	0.0%	0.0%			100.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%				
Total %	50.0%	0.0%	0.0%		50.0%	50.0%	0.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Loma Vista Dr Westbound					Bechelli Ln Northbound					Loma Vista Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 11:15 to 12:15																					
Peak Hour For Entire Intersection Begins at 11:15																					
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% App Total	0.0%	0.0%	0.0%			100.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.250	.000	.000		.250	.000	.000	.000		.000	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-022 Bechelli Ln & Hartnell Avenue
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Bechelli Ln Southbound					Hartnell Avenue Westbound					Bechelli Ln Northbound					Hartnell Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	23	41	6	0	70	25	50	17	0	92	21	34	23	0	78	8	46	22	0	76	316	0
11:15	26	46	5	0	77	21	41	22	0	84	22	42	18	0	82	6	34	32	0	72	315	0
11:30	20	32	5	0	57	29	41	30	0	100	14	49	30	0	93	5	39	19	0	63	313	0
11:45	22	32	10	0	64	34	59	21	0	114	21	41	40	0	102	7	42	23	0	72	352	0
Total	91	151	26	0	268	109	191	90	0	390	78	166	111	0	355	26	161	96	0	283	1296	0
12:00	23	42	3	0	68	29	46	21	0	96	24	53	29	0	106	3	50	25	0	78	348	0
12:15	29	43	5	0	77	29	24	11	0	64	26	33	27	0	86	2	34	20	0	56	283	0
12:30	22	38	6	0	66	36	48	16	0	100	21	43	21	0	85	5	31	23	0	59	310	0
12:45	32	35	8	0	75	31	55	17	0	103	18	60	32	0	110	4	40	24	0	68	356	0
Total	106	158	22	0	286	125	173	65	0	363	89	189	109	0	387	14	155	92	0	261	1297	0
13:00	28	38	8	0	74	39	45	19	0	103	19	37	23	0	79	6	45	24	0	75	331	0
13:15	13	41	6	0	60	36	48	28	0	112	18	36	25	0	79	2	38	30	0	70	321	0
13:30	26	40	7	0	73	31	38	28	0	97	20	53	21	0	94	4	44	18	0	66	330	0
13:45	18	46	5	0	69	35	35	26	0	96	23	45	22	0	90	2	36	16	0	54	309	0
Total	85	165	26	0	276	141	166	101	0	408	80	171	91	0	342	14	163	88	0	265	1291	0
Grand Total	282	474	74	0	830	375	530	256	0	1161	247	526	311	0	1084	54	479	276	0	809	3884	0
Apprch %	34.0%	57.1%	8.9%	0.0%		32.3%	45.7%	22.0%	0.0%		22.8%	48.5%	28.7%	0.0%		6.7%	59.2%	34.1%	0.0%			
Total %	7.3%	12.2%	1.9%	0.0%	21.4%	9.7%	13.6%	6.6%	0.0%	29.9%	6.4%	13.5%	8.0%	0.0%	27.9%	1.4%	12.3%	7.1%	0.0%	20.8%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Hartnell Avenue Westbound					Bechelli Ln Northbound					Hartnell Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	32	35	8	0	75	31	55	17	0	103	18	60	32	0	110	4	40	24	0	68	356
13:00	28	38	8	0	74	39	45	19	0	103	19	37	23	0	79	6	45	24	0	75	331
13:15	13	41	6	0	60	36	48	28	0	112	18	36	25	0	79	2	38	30	0	70	321
13:30	26	40	7	0	73	31	38	28	0	97	20	53	21	0	94	4	44	18	0	66	330
Total Volume	99	154	29	0	282	137	186	92	0	415	75	186	101	0	362	16	167	96	0	279	1338
% App Total	35.1%	54.6%	10.3%	0.0%		33.0%	44.8%	22.2%	0.0%		20.7%	51.4%	27.9%	0.0%		5.7%	59.9%	34.4%	0.0%		
PHF	.773	.939	.906	.000	.940	.878	.845	.821	.000	.926	.938	.775	.789	.000	.823	.667	.928	.800	.000	.930	.940

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-022 Bechelli Ln & Hartnell Avenue
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Bechelli Ln Southbound					Hartnell Avenue Westbound					Bechelli Ln Northbound					Hartnell Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
11:15	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	3
11:30	0	0	0	0	0	0	1	0	0	1	0	0	0	3	0	0	1	0	0	1	2	3
11:45	0	1	0	0	1	0	1	1	0	2	0	0	0	3	0	0	0	0	1	0	3	4
Total	0	1	0	0	1	0	3	1	1	4	0	0	0	8	0	0	2	0	1	2	7	10
12:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
12:30	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	2	2
12:45	0	1	0	0	1	0	1	0	1	1	0	2	1	1	3	0	0	0	0	0	5	2
Total	2	2	0	0	4	1	1	0	2	2	0	2	1	1	3	0	1	0	1	1	10	4
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	1	0	0	1	2	2
13:30	0	0	0	0	0	0	0	0	3	0	0	1	1	4	2	0	2	0	2	2	4	9
13:45	0	2	0	0	2	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	3	2
Total	0	2	0	0	2	0	3	0	5	3	0	1	1	6	2	0	3	0	2	3	10	13
Grand Total	2	5	0	0	7	1	7	1	8	9	0	3	2	15	5	0	6	0	4	6	27	27
Apprch %	28.6%	71.4%	0.0%			11.1%	77.8%	11.1%			0.0%	60.0%	40.0%			0.0%	100.0%	0.0%				
Total %	7.4%	18.5%	0.0%		25.9%	3.7%	25.9%	3.7%		33.3%	0.0%	11.1%	7.4%		18.5%	0.0%	22.2%	0.0%		22.2%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Hartnell Avenue Westbound					Bechelli Ln Northbound					Hartnell Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	0	1	0	0	1	0	1	0	1	1	0	2	1	1	3	0	0	0	0	0	5
13:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
13:15	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	1	0	0	1	2
13:30	0	0	0	0	0	0	0	0	3	0	0	1	1	4	2	0	2	0	2	2	4
Total Volume	0	1	0	0	1	0	3	0	5	3	0	3	2	6	5	0	3	0	2	3	12
% App Total	0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			0.0%	60.0%	40.0%			0.0%	100.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.750	.000		.750	.000	.375	.500		.417	.000	.375	.000		.375	.600

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-022 Bechelli Ln & Hartnell Avenue
Date : 9/10/2016

Bank 2 Count = Bikes

	Bechelli Ln Southbound					Hartnell Avenue Westbound					Bechelli Ln Northbound					Hartnell Avenue Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:15	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	3	0
11:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
11:45	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2	0
Total	1	1	0	0	2	0	2	0	0	2	0	2	0	0	2	1	0	0	0	1	7	0
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	4	0
13:00	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	3	0
13:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:30	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	2	1	0	0	3	0	0	0	0	0	0	2	0	0	2	6	0
Grand Total	2	2	0	0	4	2	3	0	0	5	0	3	0	0	3	1	4	0	0	5	17	0
Apprch %	50.0%	50.0%	0.0%			40.0%	60.0%	0.0%			0.0%	100.0%	0.0%			20.0%	80.0%	0.0%				
Total %	11.8%	11.8%	0.0%		23.5%	11.8%	17.6%	0.0%		29.4%	0.0%	17.6%	0.0%		17.6%	5.9%	23.5%	0.0%		29.4%	100.0%	

NOON PEAK	Bechelli Ln Southbound					Hartnell Avenue Westbound					Bechelli Ln Northbound					Hartnell Avenue Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	3
13:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13:30	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Volume	1	0	0	0	1	2	1	0	0	3	0	0	0	0	0	0	2	0	0	2	6
% App Total	100.0%	0.0%	0.0%			66.7%	33.3%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.250	.000	.000		.250	.500	.250	.000		.375	.000	.000	.000		.000	.000	.500	.000		.500	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-023 Churn Creek Rd & Public Right of Way to Chevron Sta
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Churn Creek Rd Southbound					Public Right of Way to Chevron Station Westbound					Churn Creek Rd Northbound					Public Right of Way to Chevron Station Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	0	51	3	1	55	0	0	0	0	0	3	55	0	1	59	2	0	1	0	3	117	2
11:15	0	59	6	0	65	0	0	0	0	0	8	45	0	2	55	2	0	0	0	2	122	2
11:30	0	69	0	0	69	0	0	0	0	0	3	61	0	1	65	0	0	0	0	0	134	1
11:45	0	49	1	1	51	0	0	0	0	0	4	79	0	1	84	2	0	0	0	2	137	2
Total	0	228	10	2	240	0	0	0	0	0	18	240	0	5	263	6	0	1	0	7	510	7
12:00	0	71	3	0	74	0	0	0	0	0	2	70	0	2	74	0	0	1	0	1	149	2
12:15	0	68	2	0	70	0	0	0	0	0	4	65	0	2	71	3	0	0	0	3	144	2
12:30	0	58	1	1	60	0	0	0	0	0	2	73	0	0	75	0	0	0	0	0	135	1
12:45	0	69	5	0	74	0	0	0	0	0	0	65	0	2	67	2	0	0	0	2	143	2
Total	0	266	11	1	278	0	0	0	0	0	8	273	0	6	287	5	0	1	0	6	571	7
13:00	0	60	3	0	63	0	0	0	0	0	2	70	0	1	73	1	0	0	0	1	137	1
13:15	0	63	0	0	63	0	0	0	0	0	4	66	0	3	73	2	0	0	0	2	138	3
13:30	0	77	0	0	77	0	0	0	0	0	5	62	0	3	70	0	0	0	0	0	147	3
13:45	0	69	4	0	73	0	0	0	0	0	3	65	0	4	72	2	0	1	0	3	148	4
Total	0	269	7	0	276	0	0	0	0	0	14	263	0	11	288	5	0	1	0	6	570	11
Grand Total	0	763	28	3	794	0	0	0	0	0	40	776	0	22	838	16	0	3	0	19	1651	25
Apprch %	0.0%	96.1%	3.5%	0.4%		0.0%	0.0%	0.0%	0.0%		4.8%	92.6%	0.0%	2.6%		84.2%	0.0%	15.8%	0.0%			
Total %	0.0%	46.2%	1.7%	0.2%	48.1%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	47.0%	0.0%	1.3%	50.8%	1.0%	0.0%	0.2%	0.0%	1.2%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Public Right of Way to Chevron Station Westbound					Churn Creek Rd Northbound					Public Right of Way to Chevron Station Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	71	3	0	74	0	0	0	0	0	2	70	0	2	74	0	0	1	0	1	149
12:15	0	68	2	0	70	0	0	0	0	0	4	65	0	2	71	3	0	0	0	3	144
12:30	0	58	1	1	60	0	0	0	0	0	2	73	0	0	75	0	0	0	0	0	135
12:45	0	69	5	0	74	0	0	0	0	0	0	65	0	2	67	2	0	0	0	2	143
Total Volume	0	266	11	1	278	0	0	0	0	0	8	273	0	6	287	5	0	1	0	6	571
% App Total	0.0%	95.7%	4.0%	0.4%		0.0%	0.0%	0.0%	0.0%		2.8%	95.1%	0.0%	2.1%		83.3%	0.0%	16.7%	0.0%		
PHF	.000	.937	.550	.250	.939	.000	.000	.000	.000	.000	.500	.935	.000	.750	.957	.417	.000	.250	.000	.500	.958

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-023 Churn Creek Rd & Public Right of Way to Chevron Sta
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Churn Creek Rd Southbound					Public Right of Way to Chevron Station Westbound					Churn Creek Rd Northbound					Public Right of Way to Chevron Station Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1
11:15	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	3	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0
Total	0	1	1	0	2	0	0	0	0	0	3	1	0	0	4	0	0	0	1	0	6	1
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	2	1
12:15	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	1	0	2	1
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
Total	0	1	1	0	2	0	0	0	0	0	0	3	0	0	3	1	0	0	2	1	6	2
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3	0
Grand Total	0	3	2	0	5	0	0	0	0	0	4	5	0	0	9	1	0	0	3	1	15	3
Apprch %	0.0%	60.0%	40.0%			0.0%	0.0%	0.0%			44.4%	55.6%	0.0%			100.0%	0.0%	0.0%				
Total %	0.0%	20.0%	13.3%		33.3%	0.0%	0.0%	0.0%		0.0%	26.7%	33.3%	0.0%		60.0%	6.7%	0.0%	0.0%		6.7%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Public Right of Way to Chevron Station Westbound					Churn Creek Rd Northbound					Public Right of Way to Chevron Station Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	2
12:15	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	1	0	2
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Total Volume	0	1	1	0	2	0	0	0	0	0	0	3	0	0	3	1	0	0	2	1	6
% App Total	0.0%	50.0%	50.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			100.0%	0.0%	0.0%			
PHF	.000	.250	.250		.500	.000	.000	.000		.000	.000	.375	.000		.375	.250	.000	.000		.250	.750

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-023 Churn Creek Rd & Public Right of Way to Chevron Sta
Date : 9/10/2016

Bank 2 Count = Bikes

	Churn Creek Rd Southbound					Public Right of Way to Chevron Station Westbound					Churn Creek Rd Northbound					Public Right of Way to Chevron Station Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
12:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
12:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
13:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
Grand Total	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	7	0
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	28.6%	0.0%		28.6%	0.0%	0.0%	0.0%		0.0%	0.0%	71.4%	0.0%		71.4%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Public Right of Way to Chevron Station Westbound					Churn Creek Rd Northbound					Public Right of Way to Chevron Station Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
12:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.500	.000		.500	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-024 Churn Creek Rd & Arizona St
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Churn Creek Rd Southbound					Arizona St Westbound					Churn Creek Rd Northbound					Arizona St Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	5	55	0	0	60	0	0	8	0	8	0	55	3	0	58	0	0	0	0	0	126	0
11:15	12	65	0	0	77	3	0	8	0	11	0	49	1	0	50	0	0	0	0	0	138	0
11:30	12	64	0	0	76	2	0	6	0	8	0	59	1	0	60	0	0	0	0	0	144	0
11:45	11	47	0	0	58	4	0	11	0	15	0	76	3	0	79	0	0	0	0	0	152	0
Total	40	231	0	0	271	9	0	33	0	42	0	239	8	0	247	0	0	0	0	0	560	0
12:00	9	76	0	0	85	1	0	13	0	14	0	67	2	0	69	0	0	0	0	0	168	0
12:15	7	68	0	0	75	1	0	9	0	10	0	69	1	0	70	0	0	0	0	0	155	0
12:30	6	57	0	0	63	4	0	7	0	11	0	67	3	0	70	0	0	0	0	0	144	0
12:45	14	69	0	0	83	2	0	2	0	4	0	71	1	0	72	0	0	0	0	0	159	0
Total	36	270	0	0	306	8	0	31	0	39	0	274	7	0	281	0	0	0	0	0	626	0
13:00	13	61	0	1	75	4	0	10	0	14	0	68	1	0	69	0	0	0	0	0	158	1
13:15	8	65	0	1	74	2	0	10	0	12	0	68	2	0	70	0	0	0	0	0	156	1
13:30	8	68	0	0	76	4	0	11	0	15	0	59	2	0	61	0	0	0	0	0	152	0
13:45	6	76	0	0	82	1	0	8	0	9	0	60	4	0	64	0	0	0	0	0	155	0
Total	35	270	0	2	307	11	0	39	0	50	0	255	9	0	264	0	0	0	0	0	621	2
Grand Total	111	771	0	2	884	28	0	103	0	131	0	768	24	0	792	0	0	0	0	0	1807	2
Apprch %	12.6%	87.2%	0.0%	0.2%		21.4%	0.0%	78.6%	0.0%		0.0%	97.0%	3.0%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	6.1%	42.7%	0.0%	0.1%	48.9%	1.5%	0.0%	5.7%	0.0%	7.2%	0.0%	42.5%	1.3%	0.0%	43.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Arizona St Westbound					Churn Creek Rd Northbound					Arizona St Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	9	76	0	0	85	1	0	13	0	14	0	67	2	0	69	0	0	0	0	0	168
12:15	7	68	0	0	75	1	0	9	0	10	0	69	1	0	70	0	0	0	0	0	155
12:30	6	57	0	0	63	4	0	7	0	11	0	67	3	0	70	0	0	0	0	0	144
12:45	14	69	0	0	83	2	0	2	0	4	0	71	1	0	72	0	0	0	0	0	159
Total Volume	36	270	0	0	306	8	0	31	0	39	0	274	7	0	281	0	0	0	0	0	626
% App Total	11.8%	88.2%	0.0%	0.0%		20.5%	0.0%	79.5%	0.0%		0.0%	97.5%	2.5%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.643	.888	.000	.000	.900	.500	.000	.596	.000	.696	.000	.965	.583	.000	.976	.000	.000	.000	.000	.000	.932

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-024 Churn Creek Rd & Arizona St
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Churn Creek Rd Southbound					Arizona St Westbound					Churn Creek Rd Northbound					Arizona St Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
11:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
11:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	2	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	3	1
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2	0
12:45	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3	0
Total	0	2	0	0	2	0	0	1	0	1	0	3	1	0	4	0	0	0	0	0	7	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
Grand Total	0	5	0	0	5	0	0	1	1	1	0	5	1	0	6	0	0	0	0	0	12	1
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	83.3%	16.7%			0.0%	0.0%	0.0%				
Total %	0.0%	41.7%	0.0%		41.7%	0.0%	0.0%	8.3%		8.3%	0.0%	41.7%	8.3%		50.0%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Arizona St Westbound					Churn Creek Rd Northbound					Arizona St Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2
12:45	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	3
Total Volume	0	2	0	0	2	0	0	1	0	1	0	3	1	0	4	0	0	0	0	0	7
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	75.0%	25.0%			0.0%	0.0%	0.0%			
PHF	.000	.500	.000		.500	.000	.000	.250		.250	.000	.750	.250		.500	.000	.000	.000		.000	.583

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-024 Churn Creek Rd & Arizona St
Date : 9/10/2016

Bank 2 Count = Bikes

	Churn Creek Rd Southbound					Arizona St Westbound					Churn Creek Rd Northbound					Arizona St Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
12:00	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	2	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	5	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
13:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3	0
Grand Total	1	2	0	0	3	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	9	0
Apprch %	33.3%	66.7%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	11.1%	22.2%	0.0%		33.3%	0.0%	0.0%	11.1%		11.1%	0.0%	55.6%	0.0%		55.6%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Arizona St Westbound					Churn Creek Rd Northbound					Arizona St Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	0	2	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	5
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	100.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.500	.000		.500	.000	.000	.250		.250	.000	.250	.000		.250	.000	.000	.000		.000	.417

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-025 Churn Creek Rd & Loma Vista Dr
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Churn Creek Rd Southbound					Loma Vista Dr Westbound					Churn Creek Rd Northbound					Loma Vista Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	2	48	7	0	57	2	1	0	0	3	4	58	2	0	64	8	2	5	0	15	139	0
11:15	1	78	12	0	91	0	0	0	0	0	6	64	0	0	70	10	0	7	0	17	178	0
11:30	1	58	14	0	73	0	0	1	0	1	3	61	1	0	65	6	0	11	0	17	156	0
11:45	0	62	9	0	71	1	0	0	0	1	6	88	0	0	94	16	1	8	0	25	191	0
Total	4	246	42	0	292	3	1	1	0	5	19	271	3	0	293	40	3	31	0	74	664	0
12:00	0	82	4	0	86	2	1	4	0	7	7	73	0	0	80	6	0	4	0	10	183	0
12:15	1	71	9	0	81	1	0	4	0	5	3	71	2	0	76	3	1	3	0	7	169	0
12:30	0	62	8	0	70	0	0	2	0	2	2	74	1	0	77	6	1	2	0	9	158	0
12:45	0	89	14	0	103	1	2	1	0	4	4	71	1	0	76	9	0	5	0	14	197	0
Total	1	304	35	0	340	4	3	11	0	18	16	289	4	0	309	24	2	14	0	40	707	0
13:00	1	65	9	0	75	0	0	1	0	1	9	63	0	0	72	6	0	4	0	10	158	0
13:15	3	86	10	0	99	1	1	2	0	4	4	81	0	0	85	6	0	3	0	9	197	0
13:30	2	76	12	0	90	1	1	3	0	5	7	67	2	0	76	8	0	4	0	12	183	0
13:45	2	82	6	0	90	0	0	5	0	5	4	70	4	0	78	11	1	5	0	17	190	0
Total	8	309	37	0	354	2	2	11	0	15	24	281	6	0	311	31	1	16	0	48	728	0
Grand Total	13	859	114	0	986	9	6	23	0	38	59	841	13	0	913	95	6	61	0	162	2099	0
Apprch %	1.3%	87.1%	11.6%	0.0%		23.7%	15.8%	60.5%	0.0%		6.5%	92.1%	1.4%	0.0%		58.6%	3.7%	37.7%	0.0%			
Total %	0.6%	40.9%	5.4%	0.0%	47.0%	0.4%	0.3%	1.1%	0.0%	1.8%	2.8%	40.1%	0.6%	0.0%	43.5%	4.5%	0.3%	2.9%	0.0%	7.7%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Loma Vista Dr Westbound					Churn Creek Rd Northbound					Loma Vista Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	0	89	14	0	103	1	2	1	0	4	4	71	1	0	76	9	0	5	0	14	197
13:00	1	65	9	0	75	0	0	1	0	1	9	63	0	0	72	6	0	4	0	10	158
13:15	3	86	10	0	99	1	1	2	0	4	4	81	0	0	85	6	0	3	0	9	197
13:30	2	76	12	0	90	1	1	3	0	5	7	67	2	0	76	8	0	4	0	12	183
Total Volume	6	316	45	0	367	3	4	7	0	14	24	282	3	0	309	29	0	16	0	45	735
% App Total	1.6%	86.1%	12.3%	0.0%		21.4%	28.6%	50.0%	0.0%		7.8%	91.3%	1.0%	0.0%		64.4%	0.0%	35.6%	0.0%		
PHF	.500	.888	.804	.000	.891	.750	.500	.583	.000	.700	.667	.870	.375	.000	.909	.806	.000	.800	.000	.804	.933

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-025 Churn Creek Rd & Loma Vista Dr
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Churn Creek Rd Southbound					Loma Vista Dr Westbound					Churn Creek Rd Northbound					Loma Vista Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
11:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
11:30	0	0	1	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	2	1
11:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
Total	0	2	1	0	3	0	0	0	1	0	0	2	0	0	2	1	0	0	1	1	6	2
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	2	1
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
12:45	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	2	2	3	3
Total	0	1	1	0	2	0	0	0	0	0	0	2	0	1	2	1	0	1	3	2	6	4
13:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
13:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2	0
Total	0	1	1	0	2	0	0	0	0	0	1	1	0	0	2	1	0	0	0	1	5	0
Grand Total	0	4	3	0	7	0	0	0	1	0	1	5	0	1	6	3	0	1	4	4	17	6
Apprch %	0.0%	57.1%	42.9%			0.0%	0.0%	0.0%			16.7%	83.3%	0.0%			75.0%	0.0%	25.0%				
Total %	0.0%	23.5%	17.6%		41.2%	0.0%	0.0%	0.0%		0.0%	5.9%	29.4%	0.0%		35.3%	17.6%	0.0%	5.9%		23.5%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Loma Vista Dr Westbound					Churn Creek Rd Northbound					Loma Vista Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	2	2	3
13:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	1	2	0	3	0	0	0	0	0	1	0	0	1	1	1	0	1	2	2	6
% App Total	0.0%	33.3%	66.7%			0.0%	0.0%	0.0%			100.0%	0.0%	0.0%			50.0%	0.0%	50.0%			
PHF	.000	.250	.500		.375	.000	.000	.000		.000	.250	.000	.000		.250	.250	.000	.250		.250	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-025 Churn Creek Rd & Loma Vista Dr
Date : 9/10/2016

Bank 2 Count = Bikes

	Churn Creek Rd Southbound					Loma Vista Dr Westbound					Churn Creek Rd Northbound					Loma Vista Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:00	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:45	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2	0
Total	0	2	0	0	2	0	0	0	0	0	2	1	0	0	3	0	1	0	0	1	6	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0
13:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	4	0
Grand Total	0	3	1	0	4	0	0	0	0	0	2	4	0	0	6	1	1	0	0	2	12	0
Apprch %	0.0%	75.0%	25.0%			0.0%	0.0%	0.0%			33.3%	66.7%	0.0%			50.0%	50.0%	0.0%				
Total %	0.0%	25.0%	8.3%		33.3%	0.0%	0.0%	0.0%		0.0%	16.7%	33.3%	0.0%		50.0%	8.3%	8.3%	0.0%		16.7%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Loma Vista Dr Westbound					Churn Creek Rd Northbound					Loma Vista Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
13:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total Volume	0	1	0	0	1	0	0	0	0	0	2	2	0	0	4	1	0	0	0	1	6
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			50.0%	50.0%	0.0%			100.0%	0.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.000	.000		.000	.250	.250	.000		.500	.250	.000	.000		.250	.750

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-026 Churn Creek Rd & Shirley Ln / Enterprise H.S. Dwy
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Churn Creek Rd Southbound					Shirley Ln / Enterprise H.S. Dwy Westbound					Churn Creek Rd Northbound					Shirley Ln / Enterprise H.S. Dwy Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	1	90	3	0	94	0	0	0	0	0	2	94	0	0	96	3	0	2	0	5	195	0
11:15	0	101	3	1	105	0	0	0	0	0	2	84	0	0	86	5	0	7	0	12	203	1
11:30	0	92	3	0	95	0	0	0	0	0	1	98	0	0	99	3	0	1	0	4	198	0
11:45	4	93	1	0	98	0	0	0	0	0	0	122	0	0	122	3	0	0	0	3	223	0
Total	5	376	10	1	392	0	0	0	0	0	5	398	0	0	403	14	0	10	0	24	819	1
12:00	4	103	0	0	107	0	0	0	0	0	0	85	0	0	85	9	1	3	0	13	205	0
12:15	1	104	2	0	107	0	0	0	0	0	2	113	1	0	116	9	0	1	0	10	233	0
12:30	6	94	4	0	104	0	0	1	0	1	1	96	3	0	100	3	0	1	0	4	209	0
12:45	12	123	5	0	140	1	0	0	0	1	4	92	1	0	97	3	0	2	0	5	243	0
Total	23	424	11	0	458	1	0	1	0	2	7	386	5	0	398	24	1	7	0	32	890	0
13:00	0	109	3	0	112	0	0	0	0	0	2	83	1	0	86	4	0	2	0	6	204	0
13:15	1	110	4	0	115	0	0	0	0	0	2	116	0	0	118	5	0	4	0	9	242	0
13:30	0	110	4	0	114	0	0	0	0	0	2	94	0	0	96	3	0	3	0	6	216	0
13:45	0	103	4	0	107	0	0	0	0	0	0	112	0	0	112	8	0	4	0	12	231	0
Total	1	432	15	0	448	0	0	0	0	0	6	405	1	0	412	20	0	13	0	33	893	0
Grand Total	29	1232	36	1	1298	1	0	1	0	2	18	1189	6	0	1213	58	1	30	0	89	2602	1
Apprch %	2.2%	94.9%	2.8%	0.1%		50.0%	0.0%	50.0%	0.0%		1.5%	98.0%	0.5%	0.0%		65.2%	1.1%	33.7%	0.0%			
Total %	1.1%	47.3%	1.4%	0.0%	49.9%	0.0%	0.0%	0.0%	0.0%	0.1%	0.7%	45.7%	0.2%	0.0%	46.6%	2.2%	0.0%	1.2%	0.0%	3.4%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Shirley Ln / Enterprise H.S. Dwy Westbound					Churn Creek Rd Northbound					Shirley Ln / Enterprise H.S. Dwy Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	12	123	5	0	140	1	0	0	0	1	4	92	1	0	97	3	0	2	0	5	243
13:00	0	109	3	0	112	0	0	0	0	0	2	83	1	0	86	4	0	2	0	6	204
13:15	1	110	4	0	115	0	0	0	0	0	2	116	0	0	118	5	0	4	0	9	242
13:30	0	110	4	0	114	0	0	0	0	0	2	94	0	0	96	3	0	3	0	6	216
Total Volume	13	452	16	0	481	1	0	0	0	1	10	385	2	0	397	15	0	11	0	26	905
% App Total	2.7%	94.0%	3.3%	0.0%		100.0%	0.0%	0.0%	0.0%		2.5%	97.0%	0.5%	0.0%		57.7%	0.0%	42.3%	0.0%		
PHF	.271	.919	.800	.000	.859	.250	.000	.000	.000	.250	.625	.830	.500	.000	.841	.750	.000	.688	.000	.722	.931

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

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File Name : 16-7587-026 Churn Creek Rd & Shirley Ln / Enterprise H.S. Dwy
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Churn Creek Rd Southbound					Shirley Ln / Enterprise H.S. Dwy Westbound					Churn Creek Rd Northbound					Shirley Ln / Enterprise H.S. Dwy Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	2	0	0	7
11:15	0	1	0	0	1	0	0	0	6	0	0	0	0	1	0	0	0	0	1	0	1	8
11:30	0	1	0	0	1	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	1	5
11:45	0	1	0	0	1	0	0	0	5	0	0	2	0	0	2	0	0	0	0	0	3	5
Total	0	3	0	0	3	0	0	0	20	0	0	2	0	2	2	0	0	0	3	0	5	25
12:00	0	0	0	0	0	0	0	0	2	0	0	1	0	6	1	0	0	0	2	0	1	10
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2
12:30	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	1	2
12:45	0	1	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	2
Total	0	1	0	0	1	0	0	0	6	0	0	2	0	7	2	0	0	0	3	0	3	16
13:00	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0	1	2
13:15	0	1	0	0	1	0	0	0	2	0	0	1	0	1	1	0	0	0	1	0	2	4
13:30	0	3	0	0	3	0	0	0	4	0	0	0	0	4	0	0	0	0	4	0	3	12
13:45	0	1	0	0	1	0	0	0	3	0	0	3	0	0	3	0	0	0	1	0	4	4
Total	0	5	0	0	5	0	0	0	9	0	0	5	0	7	5	0	0	0	6	0	10	22
Grand Total	0	9	0	0	9	0	0	0	35	0	0	9	0	16	9	0	0	0	12	0	18	63
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	0.0%	50.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Shirley Ln / Enterprise H.S. Dwy Westbound					Churn Creek Rd Northbound					Shirley Ln / Enterprise H.S. Dwy Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	0	1	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1
13:00	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0	1
13:15	0	1	0	0	1	0	0	0	2	0	0	1	0	1	1	0	0	0	1	0	2
13:30	0	3	0	0	3	0	0	0	4	0	0	0	0	4	0	0	0	0	4	0	3
Total Volume	0	5	0	0	5	0	0	0	8	0	0	2	0	7	2	0	0	0	5	0	7
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.417	.000		.417	.000	.000	.000		.000	.000	.500	.000		.500	.000	.000	.000		.000	.583

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-026 Churn Creek Rd & Shirley Ln / Enterprise H.S. Dwy
Date : 9/10/2016

Bank 2 Count = Bikes

	Churn Creek Rd Southbound					Shirley Ln / Enterprise H.S. Dwy Westbound					Churn Creek Rd Northbound					Shirley Ln / Enterprise H.S. Dwy Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3	0
11:30	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3	0
11:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7	0
12:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
12:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
12:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3	0
13:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:15	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
13:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
13:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5	0
Grand Total	0	8	0	0	8	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	15	0
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	53.3%	0.0%		53.3%	0.0%	0.0%	0.0%		0.0%	0.0%	46.7%	0.0%		46.7%	0.0%	0.0%	0.0%		0.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Shirley Ln / Enterprise H.S. Dwy Westbound					Churn Creek Rd Northbound					Shirley Ln / Enterprise H.S. Dwy Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:45 to 13:45																					
Peak Hour For Entire Intersection Begins at 12:45																					
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13:15	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
13:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total Volume	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.375	.000		.375	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.500

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-027 Churn Creek Rd & Hartnell Ave
Date : 9/10/2016

Unshifted Count = All Vehicles & Uturns

	Churn Creek Rd Southbound					Hartnell Ave Westbound					Churn Creek Rd Northbound					Hartnell Ave Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
11:00	52	62	29	0	143	21	57	67	0	145	15	64	25	0	104	23	66	12	0	101	493	0
11:15	58	77	20	0	155	26	56	66	0	148	14	71	26	0	111	26	41	20	0	87	501	0
11:30	60	68	32	0	160	25	58	77	0	160	12	77	24	0	113	18	51	10	0	79	512	0
11:45	64	69	26	0	159	25	71	71	0	167	20	78	34	0	132	39	52	12	0	103	561	0
Total	234	276	107	0	617	97	242	281	0	620	61	290	109	0	460	106	210	54	0	370	2067	0
12:00	69	71	28	0	168	31	57	70	0	158	12	73	36	0	121	38	61	10	0	109	556	0
12:15	77	70	24	0	171	27	42	69	0	138	11	88	25	0	124	26	60	15	0	101	534	0
12:30	66	75	32	0	173	36	65	80	0	181	16	72	28	0	116	20	41	10	0	71	541	0
12:45	64	90	31	0	185	33	65	81	0	179	19	74	26	0	119	21	58	12	0	91	574	0
Total	276	306	115	0	697	127	229	300	0	656	58	307	115	0	480	105	220	47	0	372	2205	0
13:00	61	72	30	0	163	34	56	71	0	161	12	66	19	0	97	22	59	14	0	95	516	0
13:15	76	92	34	0	202	24	60	70	0	154	19	75	37	0	131	26	53	14	0	93	580	0
13:30	62	87	38	1	188	26	56	55	0	137	10	77	21	0	108	27	43	9	0	79	512	1
13:45	72	88	38	0	198	22	62	58	0	142	8	93	39	0	140	26	53	12	0	91	571	0
Total	271	339	140	1	751	106	234	254	0	594	49	311	116	0	476	101	208	49	0	358	2179	1
Grand Total	781	921	362	1	2065	330	705	835	0	1870	168	908	340	0	1416	312	638	150	0	1100	6451	1
Apprch %	37.8%	44.6%	17.5%	0.0%		17.6%	37.7%	44.7%	0.0%		11.9%	64.1%	24.0%	0.0%		28.4%	58.0%	13.6%	0.0%			
Total %	12.1%	14.3%	5.6%	0.0%	32.0%	5.1%	10.9%	12.9%	0.0%	29.0%	2.6%	14.1%	5.3%	0.0%	22.0%	4.8%	9.9%	2.3%	0.0%	17.1%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Hartnell Ave Westbound					Churn Creek Rd Northbound					Hartnell Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:30 to 13:30																					
Peak Hour For Entire Intersection Begins at 12:30																					
12:30	66	75	32	0	173	36	65	80	0	181	16	72	28	0	116	20	41	10	0	71	541
12:45	64	90	31	0	185	33	65	81	0	179	19	74	26	0	119	21	58	12	0	91	574
13:00	61	72	30	0	163	34	56	71	0	161	12	66	19	0	97	22	59	14	0	95	516
13:15	76	92	34	0	202	24	60	70	0	154	19	75	37	0	131	26	53	14	0	93	580
Total Volume	267	329	127	0	723	127	246	302	0	675	66	287	110	0	463	89	211	50	0	350	2211
% App Total	36.9%	45.5%	17.6%	0.0%		18.8%	36.4%	44.7%	0.0%		14.3%	62.0%	23.8%	0.0%		25.4%	60.3%	14.3%	0.0%		
PHF	.878	.894	.934	.000	.895	.882	.946	.932	.000	.932	.868	.957	.743	.000	.884	.856	.894	.893	.000	.921	.953

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-027 Churn Creek Rd & Hartnell Ave
Date : 9/10/2016

Bank 1 Count = Heavy Trucks & Peds

	Churn Creek Rd Southbound					Hartnell Ave Westbound					Churn Creek Rd Northbound					Hartnell Ave Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	1	0	0	7	1	0	1	2	6	3	0	0	0	1	0	1	1	0	2	2	6	16
11:15	0	0	0	2	0	1	1	0	4	2	0	0	0	2	0	0	0	0	4	0	2	12
11:30	1	1	0	3	2	0	1	2	5	3	0	1	0	1	1	0	1	0	1	1	7	10
11:45	0	0	0	8	0	0	1	0	5	1	1	2	0	1	3	0	0	0	2	0	4	16
Total	2	1	0	20	3	1	4	4	20	9	1	3	0	5	4	1	2	0	9	3	19	54
12:00	0	0	1	2	1	0	0	2	2	2	0	1	0	0	1	0	0	0	2	0	4	6
12:15	1	0	0	1	1	0	2	1	0	3	0	0	0	3	0	0	2	0	1	2	6	5
12:30	0	1	0	2	1	0	0	0	0	0	0	1	0	3	1	0	1	0	3	1	3	8
12:45	0	0	0	1	0	0	0	1	2	1	0	0	0	1	0	1	0	0	0	1	2	4
Total	1	1	1	6	3	0	2	4	4	6	0	2	0	7	2	1	3	0	6	4	15	23
13:00	0	0	0	1	0	0	1	0	5	1	0	1	0	1	1	0	0	0	1	0	2	8
13:15	1	1	0	0	2	0	0	0	3	0	0	1	0	0	1	0	0	1	0	1	4	3
13:30	1	1	0	0	2	0	0	0	0	0	0	0	0	3	0	0	1	1	3	2	4	6
13:45	0	0	0	4	0	1	1	0	6	2	0	1	2	1	3	0	1	0	0	1	6	11
Total	2	2	0	5	4	1	2	0	14	3	0	3	2	5	5	0	2	2	4	4	16	28
Grand Total	5	4	1	31	10	2	8	8	38	18	1	8	2	17	11	2	7	2	19	11	50	105
Apprch %	50.0%	40.0%	10.0%			11.1%	44.4%	44.4%			9.1%	72.7%	18.2%			18.2%	63.6%	18.2%				
Total %	10.0%	8.0%	2.0%		20.0%	4.0%	16.0%	16.0%		36.0%	2.0%	16.0%	4.0%		22.0%	4.0%	14.0%	4.0%		22.0%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Hartnell Ave Westbound					Churn Creek Rd Northbound					Hartnell Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:30 to 13:30																					
Peak Hour For Entire Intersection Begins at 12:30																					
12:30	0	1	0	2	1	0	0	0	0	0	0	1	0	3	1	0	1	0	3	1	3
12:45	0	0	0	1	0	0	0	1	2	1	0	0	0	1	0	1	0	0	0	1	2
13:00	0	0	0	1	0	0	1	0	5	1	0	1	0	1	1	0	0	0	1	0	2
13:15	1	1	0	0	2	0	0	0	3	0	0	1	0	0	1	0	0	1	0	1	4
Total Volume	1	2	0	4	3	0	1	1	10	2	0	3	0	5	3	1	1	1	4	3	11
% App Total	33.3%	66.7%	0.0%			0.0%	50.0%	50.0%			0.0%	100.0%	0.0%			33.3%	33.3%	33.3%			
PHF	.250	.500	.000		.375	.000	.250	.250		.500	.000	.750	.000		.750	.250	.250	.250		.750	.688

ALL TRAFFIC DATA

City of Redding
All Vehicles & Uturns On Unshifted
Heavy Trucks & Peds On Bank 1
Bikes On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7587-027 Churn Creek Rd & Hartnell Ave
Date : 9/10/2016

Bank 2 Count = Bikes

	Churn Creek Rd Southbound					Hartnell Ave Westbound					Churn Creek Rd Northbound					Hartnell Ave Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Peds Total
11:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
11:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:30	0	1	0	0	1	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	5	0
11:45	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	2	0
Total	0	1	1	0	2	0	1	1	0	2	0	4	0	0	4	0	0	1	0	1	9	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
12:30	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	4	0
12:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2	0
Total	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	4	0	0	4	7	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
13:15	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	5	0
13:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	3	0
13:45	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	3	0
Total	0	2	1	0	3	0	0	0	0	0	0	3	0	0	3	0	2	4	0	6	12	0
Grand Total	0	4	2	0	6	0	1	1	0	2	0	9	0	0	9	0	6	5	0	11	28	0
Apprch %	0.0%	66.7%	33.3%			0.0%	50.0%	50.0%			0.0%	100.0%	0.0%			0.0%	54.5%	45.5%				
Total %	0.0%	14.3%	7.1%		21.4%	0.0%	3.6%	3.6%		7.1%	0.0%	32.1%	0.0%		32.1%	0.0%	21.4%	17.9%		39.3%	100.0%	

NOON PEAK	Churn Creek Rd Southbound					Hartnell Ave Westbound					Churn Creek Rd Northbound					Hartnell Ave Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:30 to 13:30																					
Peak Hour For Entire Intersection Begins at 12:30																					
12:30	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	4
12:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
13:15	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	5
Total Volume	0	2	1	0	3	0	0	0	0	0	0	2	0	0	2	0	4	3	0	7	12
% App Total	0.0%	66.7%	33.3%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	57.1%	42.9%			
PHF	.000	.500	.250		.375	.000	.000	.000		.000	.000	.500	.000		.500	.000	.500	.375		.583	.600

EXISTING PLUS PROJECT INTERSECTION MITIGATION LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
				Un-Mitigated		Mitigated		Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	63.7	E	16.9	B	75.2	E	20.0	B	-	-	-	-
8	S. Bonnyview Rd/ I-5 NB Ramps	Signal	D	39.0	D	22.3	C	30.9	C	27.1	C	-	-	-	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for

YEAR 2020 PLUS PROJECT INTERSECTION MITIGATION LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
				Un-Mitigated		Mitigated		Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
5	S. Bonnyview Rd/ Bechelli Ln	Signal	D	34.9	C	52.0	D	46.2	D	31.3	C	26.3	C	32.8	C
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	63.7	E	23.3	C	75.2	E	22.5	C	-	-	-	-
13	Churn Creek Rd/ Victor Ave	TWSC	D	-	-	-	-	78.7	F	32.8	D	-	-	-	-
14	Churn Creek Rd/ Rancho Rd	TWSC	C	-	-	-	-	25.7	D	15.3	C	-	-	-	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for

YEAR 2040 PLUS PROJECT INTERSECTION MITIGATION LOS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
				Un-Mitigated		Mitigated		Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
5	S. Bonnyview Rd/ Bechelli Ln	Signal	D	58.6	E	48.1	D	76.3	E	47.1	D	-	-	-	-
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	83.5	F	23.8	C	114.7	F	36.3	D	-	-	-	-
8	S. Bonnyview Rd/ I-5 NB Ramps	Signal	D	59.2	E	30.2	C	-	-	-	-	-	-	-	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	-	-	-	-	107.3	F	24.8	C	-	-	-	-
12	Churn Creek Rd/ Huntington Dr	TWSC	D	-	-	-	-	-	-	-	-	52.1	F	18.6	C
13	Churn Creek Rd/ Victor Ave	RNDBT	D	84.5	F	10.7	B	OVR	F	13.9	B	54.2	D	8.1	A
14	Churn Creek Rd/ Rancho Rd	RNDBT	C	45.7	D	10.7	B	72.2	E	13.9	B	-	-	-	-
21	Bechelli Ln/ Loma Vista Dr	Signal	C	116.9	F	21.4	C	OVR	F	27.5	C	-	-	-	-
21	Bechelli Ln/ Loma Vista Dr	RNDBT	C	116.9	F	8.2	A	OVR	F	11.3	A	-	-	-	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for

3. OVR = Delay exceeds 300 seconds

YEAR 2020 PLUS PROJECT ROADWAY SEGMENT MITIGATION LOS

#	Roadway Segment	Capacity Configuration Un-Mitigated	Capacity Configuration Mitigated	Target LOS	AM Peak Hour				PM Peak Hour			
					Un-Mitigated		Mitigated		Un-Mitigated		Mitigated	
					ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	Divided Arterial	D	614	E	614	C	623	E	623	C

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

YEAR 2040 PLUS PROJECT ROADWAY SEGMENT MITIGATION LOS

#	Roadway Segment	Capacity Configuration Un-Mitigated	Capacity Configuration Mitigated	Target LOS	AM Peak Hour				PM Peak Hour			
					ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	Divided Arterial	D	14.2	E	17.2	D	16.3	E	17	D
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	Divided Arterial	C	-	-	-	-	672	E	630	C

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

YEAR 2040 PLUS PROJECT ROADWAY SEGMENT MITIGATION LOS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes Un-Mitigated	No. of Lanes Mitigated	Saturday Peak Hour					
						Un-Mitigated			Mitigated		
						Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)										
8	Knighton Rd Off Ramp SB	D	Diverge	1	1	312	36.0	E	312	24.3	C
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	3	3,580	35.1	E	3,580	21.2	C

Notes:

Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln

Appendix B: Synchro Outputs



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	7	70	52	281	78	266	1	45	677	346	217	269
Future Volume (vph)	7	70	52	281	78	266	1	45	677	346	217	269
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1490	3312	1462	2891	1518	1408		1490	3312	1482	2891	3312
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1490	3312	1462	2891	1518	1408		1490	3312	1482	2891	3312
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	8	80	59	319	89	302	1	51	769	393	247	306
RTOR Reduction (vph)	0	0	51	0	35	148	0	0	0	178	0	0
Lane Group Flow (vph)	8	80	8	319	166	42	0	52	769	215	247	306
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot	NA
Protected Phases	8	8		7	7		1	1	6	7	5	2
Permitted Phases			8			7				6		
Actuated Green, G (s)	14.5	14.5	14.5	23.3	23.3	23.3		8.8	32.8	56.1	15.2	39.2
Effective Green, g (s)	14.5	14.5	14.5	23.3	23.3	23.3		8.8	32.8	56.1	15.2	39.2
Actuated g/C Ratio	0.14	0.14	0.14	0.22	0.22	0.22		0.08	0.31	0.53	0.14	0.37
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	3.0	5.0
Lane Grp Cap (vph)	204	453	200	636	333	309		123	1025	785	414	1225
v/s Ratio Prot	0.01	c0.02		c0.11	0.11			0.03	c0.23	0.06	c0.09	0.09
v/s Ratio Perm			0.01			0.03				0.08		
v/c Ratio	0.04	0.18	0.04	0.50	0.50	0.14		0.42	0.75	0.27	0.60	0.25
Uniform Delay, d1	39.7	40.4	39.7	36.2	36.2	33.2		46.1	32.9	13.7	42.5	23.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	0.6	1.2	0.2		2.3	3.7	0.2	2.3	0.2
Delay (s)	39.7	40.6	39.7	36.8	37.4	33.4		48.5	36.6	13.9	44.8	23.4
Level of Service	D	D	D	D	D	C		D	D	B	D	C
Approach Delay (s)		40.2			36.1				29.8			32.9
Approach LOS		D			D				C			C

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	105.9	Sum of lost time (s)	20.1
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	3
Future Volume (vph)	3
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1448
Flt Permitted	1.00
Satd. Flow (perm)	1448
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	3
RTOR Reduction (vph)	2
Lane Group Flow (vph)	1
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	9%
Turn Type	Perm
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	39.2
Effective Green, g (s)	39.2
Actuated g/C Ratio	0.37
Clearance Time (s)	6.5
Vehicle Extension (s)	5.0
Lane Grp Cap (vph)	535
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	21.0
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	21.0
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	24	70	540	33	214	490	90	93	120	510	66	49
Future Volume (vph)	24	70	540	33	214	490	90	93	120	510	66	49
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900
Total Lost time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1533	3406	1524	1533	3406	1485	1533	1792	1524	1533	1673
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1533	3406	1524	1533	3406	1485	1533	1792	1524	1533	1673
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	78	600	37	238	544	100	103	133	567	73	54
RTOR Reduction (vph)	0	0	0	26	0	0	60	0	0	483	0	19
Lane Group Flow (vph)	0	105	600	11	238	544	40	103	133	84	73	72
Confl. Peds. (#/hr)							3					
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			6			3		
Actuated Green, G (s)		11.3	27.9	27.9	20.2	36.8	36.8	13.5	13.5	13.5	12.1	12.1
Effective Green, g (s)		11.3	27.9	27.9	20.2	36.8	36.8	13.5	13.5	13.5	12.1	12.1
Actuated g/C Ratio		0.12	0.31	0.31	0.22	0.40	0.40	0.15	0.15	0.15	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0	2.0	8.0	8.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		189	1041	466	339	1374	599	226	265	225	203	221
v/s Ratio Prot		0.07	c0.18		c0.16	0.16		0.07	c0.07		c0.05	0.04
v/s Ratio Perm				0.01			0.03			0.06		
v/c Ratio		0.56	0.58	0.02	0.70	0.40	0.07	0.46	0.50	0.37	0.36	0.33
Uniform Delay, d1		37.6	26.7	22.1	32.7	19.3	16.7	35.5	35.8	35.0	36.0	35.9
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.0	2.2	0.1	5.3	0.8	0.2	0.5	0.5	0.4	0.4	0.3
Delay (s)		39.6	28.8	22.2	38.0	20.1	16.9	36.0	36.3	35.4	36.4	36.2
Level of Service		D	C	C	D	C	B	D	D	D	D	D
Approach Delay (s)			30.0			24.6			35.6			36.3
Approach LOS			C			C			D			D

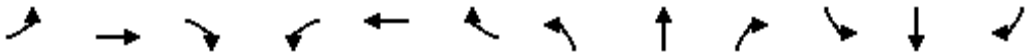
Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	17.5
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	37
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	1038	18	33	734	310	1	3	9	241	10	35
Future Volume (vph)	31	1038	18	33	734	310	1	3	9	241	10	35
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.91			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.96	
Satd. Flow (prot)	1533	3397		1533	3406	1487		1621			1689	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.96	
Satd. Flow (perm)	1533	3397		1533	3406	1487		1621			1689	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	38	1281	22	41	906	383	1	4	11	298	12	43
RTOR Reduction (vph)	0	1	0	0	0	218	0	11	0	0	4	0
Lane Group Flow (vph)	38	1302	0	41	906	165	0	5	0	0	349	0
Confl. Peds. (#/hr)						3						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						
Actuated Green, G (s)	4.2	35.6		4.3	35.3	35.3		1.0			23.4	
Effective Green, g (s)	4.2	35.6		4.3	35.3	35.3		1.0			23.4	
Actuated g/C Ratio	0.05	0.43		0.05	0.43	0.43		0.01			0.29	
Clearance Time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Vehicle Extension (s)	2.0	7.9		2.0	7.3	7.3		2.0			2.0	
Lane Grp Cap (vph)	78	1472		80	1464	639		19			481	
v/s Ratio Prot	0.02	c0.38		c0.03	0.27			c0.00			c0.21	
v/s Ratio Perm						0.11						
v/c Ratio	0.49	0.88		0.51	0.62	0.26		0.27			0.73	
Uniform Delay, d1	37.9	21.4		37.9	18.2	15.0		40.2			26.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	1.7	8.1		2.3	1.7	0.8		2.8			4.6	
Delay (s)	39.6	29.4		40.2	19.9	15.8		43.0			31.1	
Level of Service	D	C		D	B	B		D			C	
Approach Delay (s)		29.7			19.3			43.0			31.1	
Approach LOS		C			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	1253	4	1	3	1052	25	3	0	4	21	0
Future Volume (vph)	10	1253	4	1	3	1052	25	3	0	4	21	0
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Frt	1.00	1.00			1.00	1.00			0.93			0.95
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.97
Satd. Flow (prot)	1518	3372			1518	3360			1607			1632
Flt Permitted	0.95	1.00			0.95	1.00			0.96			1.00
Satd. Flow (perm)	1518	3372			1518	3360			1582			1682
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	12	1510	5	1	4	1267	30	4	0	5	25	0
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	9	0	0	40
Lane Group Flow (vph)	12	1515	0	0	5	1296	0	0	0	0	0	1
Confl. Peds. (#/hr)			1				1					
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	1.4	82.1			1.2	81.9			3.0			3.0
Effective Green, g (s)	1.4	82.1			1.2	81.9			3.0			3.0
Actuated g/C Ratio	0.01	0.82			0.01	0.82			0.03			0.03
Clearance Time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Vehicle Extension (s)	2.0	7.3			2.0	7.3			2.0			2.0
Lane Grp Cap (vph)	21	2768			18	2751			47			50
v/s Ratio Prot	c0.01	c0.45			0.00	0.39						
v/s Ratio Perm									0.00			c0.00
v/c Ratio	0.57	0.55			0.28	0.47			0.01			0.02
Uniform Delay, d1	49.0	2.9			49.0	2.7			47.1			47.1
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	21.2	0.8			3.0	0.6			0.0			0.1
Delay (s)	70.2	3.7			52.0	3.2			47.1			47.2
Level of Service	E	A			D	A			D			D
Approach Delay (s)		4.2				3.4			47.1			47.2
Approach LOS		A				A			D			D

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	13
Future Volume (vph)	13
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	16
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	7%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	253	994	10	1	19	908	315	19	14	18	120	5
Future Volume (vph)	253	994	10	1	19	908	315	19	14	18	120	5
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (prot)	1533	3401			1533	3406	1524		1742	1524	1456	1628
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (perm)	1533	3401			1533	3406	1524		1742	1524	1456	1628
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	288	1130	11	1	22	1032	358	22	16	20	136	6
RTOR Reduction (vph)	0	0	0	0	0	0	197	0	0	19	0	0
Lane Group Flow (vph)	288	1141	0	0	23	1032	161	0	38	1	71	71
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	20.9	60.3			2.2	40.6	40.6		3.5	3.5	7.3	7.3
Effective Green, g (s)	20.9	60.3			2.2	40.6	40.6		3.5	3.5	7.3	7.3
Actuated g/C Ratio	0.23	0.67			0.02	0.45	0.45		0.04	0.04	0.08	0.08
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	355	2278			37	1536	687		67	59	118	132
v/s Ratio Prot	c0.19	0.34			0.02	c0.30			c0.02		c0.05	0.04
v/s Ratio Perm							0.11			0.00		
v/c Ratio	0.81	0.50			0.62	0.67	0.24		0.57	0.01	0.60	0.54
Uniform Delay, d1	32.7	7.4			43.5	19.5	15.2		42.5	41.6	39.9	39.7
Progression Factor	1.00	1.00			1.19	0.64	0.50		1.00	1.00	1.00	1.00
Incremental Delay, d2	12.5	0.8			18.7	2.1	0.7		6.4	0.0	5.8	2.1
Delay (s)	45.2	8.2			70.5	14.5	8.3		48.9	41.6	45.7	41.8
Level of Service	D	A			E	B	A		D	D	D	D
Approach Delay (s)		15.6				13.8			46.4			41.0
Approach LOS		B				B			D			D

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	139
Future Volume (vph)	139
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	158
RTOR Reduction (vph)	145
Lane Group Flow (vph)	13
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	7.3
Effective Green, g (s)	7.3
Actuated g/C Ratio	0.08
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	123
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.10
Uniform Delay, d1	38.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	38.5
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

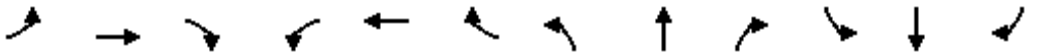
Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1133	0	23	1256	0	26
Future Vol, veh/h	1133	0	23	1256	0	26
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	1596	0	32	1769	0	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1597	0	-	799
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.22	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.26	-	-	3.36
Pot Cap-1 Maneuver	-	-	388	-	0	320
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	388	-	-	320
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	17.7
HCM LOS			C

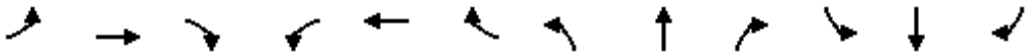
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	320	-	-	388	-
HCM Lane V/C Ratio	0.114	-	-	0.083	-
HCM Control Delay (s)	17.7	-	-	15.1	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	0.4	-	-	0.3	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	889	271	147	762	0	0	0	0	83	1	517
Future Volume (vph)	0	889	271	147	762	0	0	0	0	83	1	517
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4988	1517	1562	3471						1741	1553
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4988	1517	1562	3471						1741	1553
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	1046	319	173	896	0	0	0	0	98	1	608
RTOR Reduction (vph)	0	0	200	0	0	0	0	0	0	0	0	148
Lane Group Flow (vph)	0	1046	119	173	896	0	0	0	0	0	99	460
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		33.6	33.6	14.3	52.1						28.2	28.2
Effective Green, g (s)		33.6	33.6	14.3	52.1						28.2	28.2
Actuated g/C Ratio		0.37	0.37	0.16	0.58						0.31	0.31
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		1862	566	248	2009						545	486
v/s Ratio Prot		c0.21		c0.11	0.26						0.06	
v/s Ratio Perm			0.08									c0.30
v/c Ratio		0.56	0.21	0.70	0.45						0.18	0.95
Uniform Delay, d1		22.4	19.2	35.8	10.8						22.5	30.2
Progression Factor		0.82	0.64	0.93	0.80						1.00	1.00
Incremental Delay, d2		1.2	0.8	4.8	0.5						0.1	27.7
Delay (s)		19.6	13.1	38.3	9.1						22.6	57.9
Level of Service		B	B	D	A						C	E
Approach Delay (s)		18.1			13.9			0.0			53.0	
Approach LOS		B			B			A			D	

Intersection Summary					
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9		
Intersection Capacity Utilization	83.1%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	471	501	0	0	486	309	423	0	198	0	0	0
Future Volume (vph)	471	501	0	0	486	309	423	0	198	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1577	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1577	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	535	569	0	0	552	351	481	0	225	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	269	0	0	156	0	0	0
Lane Group Flow (vph)	535	569	0	0	552	82	0	481	69	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	27.4	52.6			21.0	21.0		27.7	27.7			
Effective Green, g (s)	27.4	52.6			21.0	21.0		27.7	27.7			
Actuated g/C Ratio	0.30	0.58			0.23	0.23		0.31	0.31			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	480	2048			817	365		539	482			
v/s Ratio Prot	c0.34	0.16			c0.16			c0.27				
v/s Ratio Perm						0.05			0.04			
v/c Ratio	1.11	0.28			0.68	0.22		0.89	0.14			
Uniform Delay, d1	31.3	9.3			31.4	27.9		29.7	22.6			
Progression Factor	0.44	0.24			0.98	2.18		1.00	1.00			
Incremental Delay, d2	74.5	0.3			4.2	1.3		17.0	0.1			
Delay (s)	88.3	2.5			35.0	62.1		46.8	22.7			
Level of Service	F	A			D	E		D	C			
Approach Delay (s)		44.1			45.5			39.1			0.0	
Approach LOS		D			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

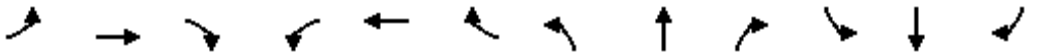
c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	12	314	373	5	0	546	126	5	3	1	72	0
Future Volume (vph)	12	314	373	5	0	546	126	5	3	1	72	0
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8		5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00		0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98		1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85		0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00		1.00			0.97	1.00		0.95
Satd. Flow (prot)		3090	3539	1549		3430			1806	1558		1770
Flt Permitted		0.95	1.00	1.00		1.00			0.97	1.00		0.95
Satd. Flow (perm)		3090	3539	1549		3430			1806	1558		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	331	393	5	0	575	133	5	3	1	76	0
RTOR Reduction (vph)	0	0	0	1	0	12	0	0	0	1	0	0
Lane Group Flow (vph)	0	344	393	4	0	696	0	0	8	0	0	76
Confl. Peds. (#/hr)				1			2			4		
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		12.7	63.5	63.5		46.4			5.8	5.8		7.0
Effective Green, g (s)		12.7	63.5	63.5		46.4			5.8	5.8		7.0
Actuated g/C Ratio		0.14	0.71	0.71		0.52			0.06	0.06		0.08
Clearance Time (s)		4.5	5.8	5.8		5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5		1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		436	2496	1092		1768			116	100		137
v/s Ratio Prot		c0.11	0.11			c0.20			c0.00			c0.04
v/s Ratio Perm				0.00						0.00		
v/c Ratio		0.79	0.16	0.00		0.39			0.07	0.00		0.55
Uniform Delay, d1		37.4	4.4	3.9		13.2			39.6	39.4		40.0
Progression Factor		0.66	1.11	1.00		1.00			1.00	1.00		1.00
Incremental Delay, d2		8.3	0.1	0.0		0.7			0.1	0.0		2.7
Delay (s)		33.1	5.0	3.9		13.9			39.7	39.4		42.7
Level of Service		C	A	A		B			D	D		D
Approach Delay (s)			18.0			13.9			39.6			39.8
Approach LOS			B			B			D			D

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	237
Future Volume (vph)	237
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	249
RTOR Reduction (vph)	230
Lane Group Flow (vph)	19
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	7.0
Effective Green, g (s)	7.0
Actuated g/C Ratio	0.08
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	123
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.16
Uniform Delay, d1	38.7
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	39.0
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	404	1	2	560	11	0	0	0	12	0	103
Future Volume (Veh/h)	38	404	1	2	560	11	0	0	0	12	0	103
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	43	454	1	2	629	12	0	0	0	13	0	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	641			455			975	1186	454	1180	1180	320
vC1, stage 1 conf vol							540	540		639	639	
vC2, stage 2 conf vol							434	645		540	541	
vCu, unblocked vol	641			384			939	1164	383	1158	1158	320
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	100	100	96	100	83
cM capacity (veh/h)	926			1083			343	347	570	335	365	669

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	498	316	326	0	13	116
Volume Left	43	2	0	0	13	0
Volume Right	1	0	12	0	0	116
cSH	926	1083	1700	1700	335	669
Volume to Capacity	0.05	0.00	0.19	0.00	0.04	0.17
Queue Length 95th (ft)	4	0	0	0	3	16
Control Delay (s)	1.3	0.1	0.0	0.0	16.2	11.5
Lane LOS	A	A		A	C	B
Approach Delay (s)	1.3	0.0		0.0	12.0	
Approach LOS				A	B	

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	52.6%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	368	49	20	570	14	5
Future Vol, veh/h	368	49	20	570	14	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	404	54	22	626	15	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	458	0	1101	431
Stage 1	-	-	-	-	431	-
Stage 2	-	-	-	-	670	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1087	-	231	618
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	503	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1087	-	224	618
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	487	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	269	-	-	1087	-
HCM Lane V/C Ratio	0.078	-	-	0.02	-
HCM Control Delay (s)	19.5	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	365	6	1	570	3	10	0	1	5	0	13
Future Vol, veh/h	3	365	6	1	570	3	10	0	1	5	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	410	7	1	640	3	11	0	1	6	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	644	0	0	417	0	0	1072	1066	413	1065	1068	642
Stage 1	-	-	-	-	-	-	420	420	-	644	644	-
Stage 2	-	-	-	-	-	-	652	646	-	421	424	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	941	-	-	1142	-	-	198	222	639	200	222	474
Stage 1	-	-	-	-	-	-	611	589	-	461	468	-
Stage 2	-	-	-	-	-	-	457	467	-	610	587	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	941	-	-	1142	-	-	191	221	639	199	221	474
Mov Cap-2 Maneuver	-	-	-	-	-	-	191	221	-	199	221	-
Stage 1	-	-	-	-	-	-	609	587	-	459	468	-
Stage 2	-	-	-	-	-	-	442	467	-	606	585	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	23.8	16.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	204	941	-	-	1142	-	-	343
HCM Lane V/C Ratio	0.061	0.004	-	-	0.001	-	-	0.059
HCM Control Delay (s)	23.8	8.8	0	-	8.2	0	-	16.2
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	98	274	389	46	33	163
Future Vol, veh/h	98	274	389	46	33	163
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	304	432	51	37	181

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	483	0	-	0	980	458
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1080	-	-	-	277	603
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	595	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1080	-	-	-	249	603
Mov Cap-2 Maneuver	-	-	-	-	249	-
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	535	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1080	-	-	-	487
HCM Lane V/C Ratio	0.101	-	-	-	0.447
HCM Control Delay (s)	8.7	-	-	-	18.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	2.3

Intersection	
Int Delay, s/veh	9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	252	54	136	40	39	302
Future Vol, veh/h	252	54	136	40	39	302
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	277	59	149	44	43	332

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	193	0	-	0	784	171
Stage 1	-	-	-	-	171	-
Stage 2	-	-	-	-	613	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1380	-	-	-	362	873
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	541	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1380	-	-	-	289	873
Mov Cap-2 Maneuver	-	-	-	-	289	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	432	-

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1380	-	-	-	709
HCM Lane V/C Ratio	0.201	-	-	-	0.529
HCM Control Delay (s)	8.3	-	-	-	15.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.7	-	-	-	3.1

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	209	284	23	30	58
Future Vol, veh/h	34	209	284	23	30	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	249	338	27	36	69

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	365	0	-	0	682	352
Stage 1	-	-	-	-	352	-
Stage 2	-	-	-	-	330	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1194	-	-	-	415	692
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1194	-	-	-	399	692
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	700	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1194	-	-	-	553
HCM Lane V/C Ratio	0.034	-	-	-	0.189
HCM Control Delay (s)	8.1	0	-	-	13
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

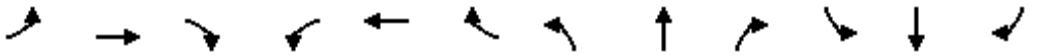
Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	39	215	175	25	61	90
Future Vol, veh/h	39	215	175	25	61	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	57	316	257	37	90	132

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	257	0	-	0	688	257
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	431	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1296	-	-	-	409	777
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1296	-	-	-	391	777
Mov Cap-2 Maneuver	-	-	-	-	391	-
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	622	-

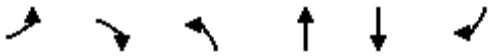
Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1296	-	-	-	555
HCM Lane V/C Ratio	0.044	-	-	-	0.4
HCM Control Delay (s)	7.9	-	-	-	15.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.9



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	14	112	6	7	7	49	335	12	9	384	104
Future Volume (vph)	188	14	112	6	7	7	49	335	12	9	384	104
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1547	1569		1547	1674		1547	1800		1547	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1547	1569		1547	1674		1547	1800		1547	1810	1538
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	224	17	133	7	8	8	58	399	14	11	457	124
RTOR Reduction (vph)	0	109	0	0	8	0	0	1	0	0	0	75
Lane Group Flow (vph)	224	41	0	7	8	0	58	412	0	11	457	49
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.1	9.4		0.7	1.0		3.8	24.0		0.7	20.9	20.9
Effective Green, g (s)	9.1	9.4		0.7	1.0		3.8	24.0		0.7	20.9	20.9
Actuated g/C Ratio	0.17	0.18		0.01	0.02		0.07	0.45		0.01	0.40	0.40
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	266	279		20	31		111	818		20	716	608
v/s Ratio Prot	c0.14	c0.03		0.00	0.00		c0.04	c0.23		0.01	c0.25	
v/s Ratio Perm												0.03
v/c Ratio	0.84	0.15		0.35	0.26		0.52	0.50		0.55	0.64	0.08
Uniform Delay, d1	21.2	18.3		25.8	25.5		23.6	10.2		25.9	12.9	10.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.8	0.2		10.3	4.5		4.4	0.5		28.9	1.9	0.1
Delay (s)	41.9	18.6		36.1	30.0		28.0	10.7		54.8	14.8	10.0
Level of Service	D	B		D	C		C	B		D	B	B
Approach Delay (s)		32.6			31.9			12.8			14.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	2	209	370	253	32
Future Volume (vph)	5	2	209	370	253	32
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3479	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3479	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	6	3	265	468	320	41
RTOR Reduction (vph)	0	3	0	0	9	0
Lane Group Flow (vph)	6	0	265	468	352	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	0.8	0.8	10.9	29.1	14.7	
Effective Green, g (s)	0.8	0.8	10.9	29.1	14.7	
Actuated g/C Ratio	0.02	0.02	0.28	0.75	0.38	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	32	32	448	1400	1321	
v/s Ratio Prot	c0.00		c0.17	c0.25	0.10	
v/s Ratio Perm		0.00				
v/c Ratio	0.19	0.00	0.59	0.33	0.27	
Uniform Delay, d1	18.6	18.6	12.0	1.6	8.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	0.0	1.4	0.3	0.2	
Delay (s)	19.7	18.6	13.4	1.9	8.5	
Level of Service	B	B	B	A	A	
Approach Delay (s)	19.3			6.0	8.5	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	38.7	Sum of lost time (s)	12.3
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	15	345	15	6	271
Future Vol, veh/h	12	15	345	15	6	271
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	15	18	421	18	7	330

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	776	431	0	0	440	0
Stage 1	431	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	364	622	-	-	1115	-
Stage 1	653	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	361	621	-	-	1115	-
Mov Cap-2 Maneuver	474	-	-	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	709	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	546	1115	-
HCM Lane V/C Ratio	-	-	0.06	0.007	-
HCM Control Delay (s)	-	-	12	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	2	38	49	368	12	22	237
Future Vol, veh/h	2	38	49	368	12	22	237
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	0	-	-	0
Grade, %	-	0	-	0	-	-	0
Peak Hour Factor	92	79	79	79	79	79	79
Heavy Vehicles, %	2	3	3	3	3	3	3
Mvmt Flow	2	48	62	466	15	28	300

Major/Minor	Minor1			Major1		Major2	
Conflicting Flow All	0	829	473	0	0	481	0
Stage 1	0	473	-	-	-	-	-
Stage 2	0	356	-	-	-	-	-
Critical Hdwy	-	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	-	5.43	-	-	-	-	-
Critical Hdwy Stg 2	-	5.43	-	-	-	-	-
Follow-up Hdwy	-	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	0	339	589	-	-	1076	-
Stage 1	0	625	-	-	-	-	-
Stage 2	0	707	-	-	-	-	-
Platoon blocked, %	-			-	-		-
Mov Cap-1 Maneuver	0	328	589	-	-	1076	-
Mov Cap-2 Maneuver	0	447	-	-	-	-	-
Stage 1	0	625	-	-	-	-	-
Stage 2	0	685	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	517	1076	-
HCM Lane V/C Ratio	-	-	0.213	0.026	-
HCM Control Delay (s)	-	-	13.8	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

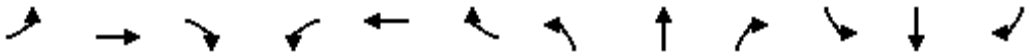
Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	1	1	49	3	114	1	336	61	76	227	4
Future Vol, veh/h	6	1	1	49	3	114	1	336	61	76	227	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1	1	66	4	154	1	454	82	103	307	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1092	1054	309	1014	1016	495	312	0	0	536	0	0
Stage 1	515	515	-	498	498	-	-	-	-	-	-	-
Stage 2	577	539	-	516	518	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	192	226	731	217	238	575	1248	-	-	1032	-	-
Stage 1	543	535	-	554	544	-	-	-	-	-	-	-
Stage 2	502	522	-	542	533	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	198	731	195	209	575	1248	-	-	1032	-	-
Mov Cap-2 Maneuver	126	198	-	195	209	-	-	-	-	-	-	-
Stage 1	542	470	-	553	543	-	-	-	-	-	-	-
Stage 2	364	521	-	474	469	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.2	30.5	0	2.2
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1248	-	-	148	358	1032	-	-
HCM Lane V/C Ratio	0.001	-	-	0.073	0.627	0.1	-	-
HCM Control Delay (s)	7.9	0	-	31.2	30.5	8.9	0	-
HCM Lane LOS	A	A	-	D	D	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	4.1	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	189	86	181	352	148	233	262	166	113	205	65
Future Volume (vph)	9	189	86	181	352	148	233	262	166	113	205	65
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1541	1593	3539	1549	1593	3311		1593	3395	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1541	1593	3539	1549	1593	3311		1593	3395	
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	12	252	115	241	469	197	311	349	221	151	273	87
RTOR Reduction (vph)	0	0	91	0	0	122	0	92	0	0	31	0
Lane Group Flow (vph)	12	252	24	241	469	75	311	478	0	151	329	0
Confl. Peds. (#/hr)			1			9			4			6
Confl. Bikes (#/hr)			3			3			2			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.1	18.5	18.5	16.6	34.0	34.0	20.2	24.3		12.8	16.9	
Effective Green, g (s)	1.1	18.5	18.5	16.6	34.0	34.0	20.2	24.3		12.8	16.9	
Actuated g/C Ratio	0.01	0.21	0.21	0.19	0.38	0.38	0.23	0.27		0.14	0.19	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	19	733	319	296	1348	590	360	901		228	643	
v/s Ratio Prot	0.01	0.07		c0.15	c0.13		c0.20	c0.14		0.09	0.10	
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.63	0.34	0.07	0.81	0.35	0.13	0.86	0.53		0.66	0.51	
Uniform Delay, d1	43.8	30.2	28.5	34.8	19.7	18.0	33.2	27.6		36.2	32.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.9	0.6	0.2	14.9	0.3	0.2	18.3	1.1		5.5	1.4	
Delay (s)	84.8	30.8	28.7	49.7	20.0	18.2	51.5	28.7		41.7	33.8	
Level of Service	F	C	C	D	C	B	D	C		D	C	
Approach Delay (s)		31.8			27.5			36.7			36.1	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	89.2	Sum of lost time (s)		17.0	
Intersection Capacity Utilization	57.4%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	5	1	2	10	442	309	13
Future Vol, veh/h	5	1	2	10	442	309	13
Conflicting Peds, #/hr	0	0	0	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	145	-	-	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	5	1	2	11	486	340	14

Major/Minor	Minor2	Major1				Major2	
Conflicting Flow All	617	178	353	355	0	-	0
Stage 1	348	-	-	-	-	-	-
Stage 2	269	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	2.22	-	-	-
Pot Cap-1 Maneuver	422	834	857	1200	-	-	-
Stage 1	686	-	-	-	-	-	-
Stage 2	752	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	421	833	1125	1125	-	-	-
Mov Cap-2 Maneuver	421	-	-	-	-	-	-
Stage 1	685	-	-	-	-	-	-
Stage 2	751	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1125	-	459	-	-
HCM Lane V/C Ratio	0.012	-	0.014	-	-
HCM Control Delay (s)	8.2	-	13	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

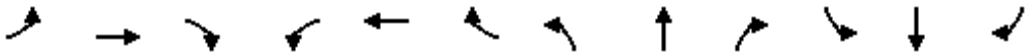
Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	57	442	5	29	306
Future Vol, veh/h	19	57	442	5	29	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	22	65	502	6	33	348

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	745	254	0	0	508	0
Stage 1	505	-	-	-	-	-
Stage 2	240	-	-	-	-	-
Critical Hdwy	6.88	6.98	-	-	4.18	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.34	-	-	2.24	-
Pot Cap-1 Maneuver	345	739	-	-	1039	-
Stage 1	566	-	-	-	-	-
Stage 2	771	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	332	739	-	-	1039	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	566	-	-	-	-	-
Stage 2	741	-	-	-	-	-

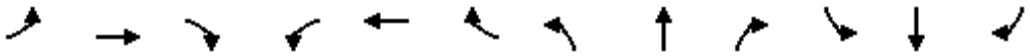
Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	631	1039	-
HCM Lane V/C Ratio	-	-	0.137	0.032	-
HCM Control Delay (s)	-	-	11.6	8.6	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	1	65	9	15	16	103	457	7	9	239	143
Future Volume (vph)	118	1	65	9	15	16	103	457	7	9	239	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.95		1.00	1.00		1.00	0.94	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1709			1743		1593	3530		1593	3304	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1709			1743		1593	3530		1593	3304	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	134	1	74	10	17	18	117	519	8	10	272	162
RTOR Reduction (vph)	0	21	0	0	17	0	0	1	0	0	91	0
Lane Group Flow (vph)	0	188	0	0	28	0	117	526	0	10	344	0
Confl. Peds. (#/hr)			7						1			8
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.4			3.4		7.8	27.6		0.8	20.6	
Effective Green, g (s)		12.4			3.4		7.8	27.6		0.8	20.6	
Actuated g/C Ratio		0.20			0.06		0.13	0.45		0.01	0.34	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		349			97		204	1605		20	1121	
v/s Ratio Prot		c0.11			c0.02		c0.07	c0.15		0.01	0.10	
v/s Ratio Perm												
v/c Ratio		0.54			0.29		0.57	0.33		0.50	0.31	
Uniform Delay, d1		21.6			27.5		24.9	10.6		29.8	14.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.6		2.4	0.2		7.0	0.3	
Delay (s)		22.4			28.1		27.3	10.8		36.7	15.1	
Level of Service		C			C		C	B		D	B	
Approach Delay (s)		22.4			28.1			13.8			15.6	
Approach LOS		C			C			B			B	

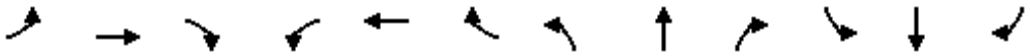
Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	60.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	55	47	34	0	5	25	626	50	182	414	47
Future Volume (vph)	63	55	47	34	0	5	25	626	50	182	414	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.93		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758			1635		1593	3491		1593	3471	
Flt Permitted		0.86			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1539			1707		1593	3491		1593	3471	
Peak-hour factor, PHF	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Adj. Flow (vph)	86	75	64	47	0	7	34	858	68	249	567	64
RTOR Reduction (vph)	0	9	0	0	52	0	0	5	0	0	6	0
Lane Group Flow (vph)	0	216	0	0	2	0	34	921	0	249	625	0
Confl. Peds. (#/hr)						149			6			10
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		27.8			3.4		4.5	37.5		21.1	54.1	
Effective Green, g (s)		27.8			3.4		4.5	37.5		21.1	54.1	
Actuated g/C Ratio		0.26			0.03		0.04	0.35		0.20	0.51	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		402			54		67	1231		316	1766	
v/s Ratio Prot							0.02	c0.26		c0.16	0.18	
v/s Ratio Perm		c0.14			c0.00							
v/c Ratio		0.54			0.03		0.51	0.75		0.79	0.35	
Uniform Delay, d1		33.7			49.9		49.8	30.3		40.5	15.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.1		2.2	3.6		11.4	0.4	
Delay (s)		34.4			49.9		52.0	33.8		51.8	16.0	
Level of Service		C			D		D	C		D	B	
Approach Delay (s)		34.4			49.9			34.5			26.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	106.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

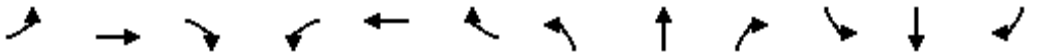
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	256	120	223	404	207	217	571	164	109	377	100
Future Volume (vph)	125	256	120	223	404	207	217	571	164	109	377	100
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1527	1593	3539	1531	1593	3395		1593	3411	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1527	1593	3539	1531	1593	3395		1593	3411	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	139	284	133	248	449	230	241	634	182	121	419	111
RTOR Reduction (vph)	0	0	95	0	0	146	0	17	0	0	18	0
Lane Group Flow (vph)	139	284	38	248	449	84	241	799	0	121	512	0
Confl. Peds. (#/hr)			24			21			19			8
Confl. Bikes (#/hr)			1			2			2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	9.6	23.6	23.6	21.0	35.0	35.0	17.3	31.9		12.8	27.1	
Effective Green, g (s)	9.6	23.6	23.6	21.0	35.0	35.0	17.3	31.9		12.8	27.1	
Actuated g/C Ratio	0.09	0.22	0.22	0.20	0.33	0.33	0.16	0.30		0.12	0.26	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	281	791	341	317	1174	507	261	1026		193	876	
v/s Ratio Prot	0.04	0.08		c0.16	c0.13		c0.15	c0.24		0.08	0.15	
v/s Ratio Perm			0.02			0.06						
v/c Ratio	0.49	0.36	0.11	0.78	0.38	0.17	0.92	0.78		0.63	0.58	
Uniform Delay, d1	45.6	34.6	32.6	40.1	27.0	24.9	43.4	33.6		44.1	34.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6	0.3	11.0	0.4	0.3	35.2	4.4		4.5	1.5	
Delay (s)	46.1	35.2	32.9	51.1	27.4	25.3	78.6	38.0		48.6	35.8	
Level of Service	D	D	C	D	C	C	E	D		D	D	
Approach Delay (s)		37.4			33.2			47.3			38.2	
Approach LOS		D			C			D			D	

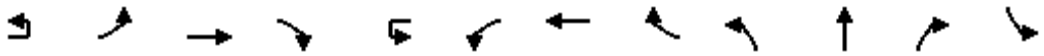
Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	105.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	75	58	487	65	195	31	412	350	303	693	9
Future Volume (vph)	6	75	58	487	65	195	31	412	350	303	693	9
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1562	3471	1533	3030	1590	1456	1562	3471	1544	3030	3471	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1562	3471	1533	3030	1590	1456	1562	3471	1544	3030	3471	1520
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	6	78	60	507	68	203	32	429	365	316	722	9
RTOR Reduction (vph)	0	0	52	0	0	0	0	0	169	0	0	6
Lane Group Flow (vph)	6	78	8	507	141	130	32	429	196	316	722	3
Confl. Peds. (#/hr)			1									1
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	14.1	14.1	14.1	26.9	26.9	26.9	5.7	24.0	50.9	17.3	35.6	35.6
Effective Green, g (s)	14.1	14.1	14.1	26.9	26.9	26.9	5.7	24.0	50.9	17.3	35.6	35.6
Actuated g/C Ratio	0.14	0.14	0.14	0.26	0.26	0.26	0.06	0.23	0.50	0.17	0.35	0.35
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	215	477	211	795	417	382	86	813	767	511	1206	528
v/s Ratio Prot	0.00	c0.02		c0.17	0.09		0.02	0.12	0.07	c0.10	c0.21	
v/s Ratio Perm			0.01			0.09			0.06			0.00
v/c Ratio	0.03	0.16	0.04	0.64	0.34	0.34	0.37	0.53	0.25	0.62	0.60	0.01
Uniform Delay, d1	38.2	38.9	38.3	33.4	30.5	30.6	46.6	34.2	14.8	39.5	27.5	21.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	1.7	0.5	0.5	2.7	1.2	0.2	2.2	1.2	0.0
Delay (s)	38.3	39.1	38.4	35.1	31.0	31.1	49.3	35.4	15.0	41.7	28.7	21.8
Level of Service	D	D	D	D	C	C	D	D	B	D	C	C
Approach Delay (s)		38.8			33.7			26.9			32.6	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	102.4	Sum of lost time (s)	20.1
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	11	40	550	79	3	469	603	36	62	45	374	78
Future Volume (vph)	11	40	550	79	3	469	603	36	62	45	374	78
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1900	1900	1710
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	12	44	604	87	3	515	663	40	68	49	411	86
RTOR Reduction (vph)	0	0	0	63	0	0	0	17	0	0	371	0
Lane Group Flow (vph)	0	56	604	24	0	518	663	23	68	49	40	86
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2				6			3	
Actuated Green, G (s)		6.9	28.7	28.7		37.1	58.9	58.9	10.0	10.0	10.0	10.3
Effective Green, g (s)		6.9	28.7	28.7		37.1	58.9	58.9	10.0	10.0	10.0	10.3
Actuated g/C Ratio		0.07	0.28	0.28		0.36	0.57	0.57	0.10	0.10	0.10	0.10
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		104	961	430		559	1973	864	150	176	149	155
v/s Ratio Prot		0.04	c0.17			c0.33	0.19		c0.04	0.03		c0.06
v/s Ratio Perm				0.02				0.01			0.03	
v/c Ratio		0.54	0.63	0.06		0.93	0.34	0.03	0.45	0.28	0.27	0.55
Uniform Delay, d1		46.8	32.8	27.5		31.9	11.9	9.8	44.2	43.5	43.4	44.5
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	2.9	0.2		21.2	0.4	0.1	0.8	0.3	0.4	2.4
Delay (s)		49.5	35.7	27.7		53.1	12.4	9.8	45.0	43.8	43.7	46.9
Level of Service		D	D	C		D	B	A	D	D	D	D
Approach Delay (s)			35.8				29.6			43.9		
Approach LOS			D				C			D		

Intersection Summary			
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	103.6	Sum of lost time (s)	17.5
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	59	34
Future Volume (vph)	59	34
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	1.00	
Satd. Flow (prot)	1728	
Flt Permitted	1.00	
Satd. Flow (perm)	1728	
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	65	37
RTOR Reduction (vph)	16	0
Lane Group Flow (vph)	86	0
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	10.3	
Effective Green, g (s)	10.3	
Actuated g/C Ratio	0.10	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	171	
v/s Ratio Prot	0.05	
v/s Ratio Perm		
v/c Ratio	0.50	
Uniform Delay, d1	44.2	
Progression Factor	1.00	
Incremental Delay, d2	0.8	
Delay (s)	45.1	
Level of Service	D	
Approach Delay (s)	45.9	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	4	37	902	1	2	2	1012	200	5	13	7	319
Future Volume (vph)	4	37	902	1	2	2	1012	200	5	13	7	319
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		0.96		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (prot)		1577	3504			1577	3505	1533		1748		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (perm)		1577	3504			1577	3505	1533		1748		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	41	1002	1	2	2	1124	222	6	14	8	354
RTOR Reduction (vph)	0	0	0	0	0	0	0	137	0	7	0	0
Lane Group Flow (vph)	0	45	1003	0	0	4	1124	85	0	21	0	0
Confl. Peds. (#/hr)								1			1	
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.5	40.0			0.8	35.9	35.9		7.7		
Effective Green, g (s)		4.5	40.0			0.8	35.9	35.9		7.7		
Actuated g/C Ratio		0.05	0.43			0.01	0.38	0.38		0.08		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		75	1500			13	1347	589		144		
v/s Ratio Prot		c0.03	0.29			0.00	c0.32			c0.01		
v/s Ratio Perm								0.06				
v/c Ratio		0.60	0.67			0.31	0.83	0.14		0.14		
Uniform Delay, d1		43.6	21.4			46.0	26.1	18.7		39.8		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		8.3	2.3			4.8	5.7	0.4		0.2		
Delay (s)		51.9	23.7			50.9	31.7	19.2		40.0		
Level of Service		D	C			D	C	B		D		
Approach Delay (s)			24.9				29.7			40.0		
Approach LOS			C				C			D		

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	93.4	Sum of lost time (s)	18.2
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1	31
Future Volume (vph)	1	31
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	0.96	
Satd. Flow (prot)	1742	
Flt Permitted	0.96	
Satd. Flow (perm)	1742	
Peak-hour factor, PHF	0.90	0.90
Adj. Flow (vph)	1	34
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	386	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	33%	3%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	27.1	
Effective Green, g (s)	27.1	
Actuated g/C Ratio	0.29	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	505	
v/s Ratio Prot	c0.22	
v/s Ratio Perm		
v/c Ratio	0.76	
Uniform Delay, d1	30.2	
Progression Factor	1.00	
Incremental Delay, d2	6.1	
Delay (s)	36.4	
Level of Service	D	
Approach Delay (s)	36.4	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	14	1227	3	2	14	1234	41	4	0	11	22
Future Volume (vph)	1	14	1227	3	2	14	1234	41	4	0	11	22
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	1.00			0.90		
Flt Protected		0.95	1.00			0.95	1.00			0.99		
Satd. Flow (prot)		1547	3437			1547	3419			1591		
Flt Permitted		0.95	1.00			0.95	1.00			0.90		
Satd. Flow (perm)		1547	3437			1547	3419			1449		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1	14	1265	3	2	14	1272	42	4	0	11	23
RTOR Reduction (vph)	0	0	0	0	0	0	1	0	0	14	0	0
Lane Group Flow (vph)	0	15	1268	0	0	16	1313	0	0	1	0	0
Confl. Peds. (#/hr)				1				4			4	
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		1.4	70.0			1.4	70.0			4.9		
Effective Green, g (s)		1.4	70.0			1.4	70.0			4.9		
Actuated g/C Ratio		0.02	0.78			0.02	0.78			0.05		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		24	2673			24	2659			78		
v/s Ratio Prot		0.01	0.37			c0.01	c0.38					
v/s Ratio Perm										0.00		
v/c Ratio		0.62	0.47			0.67	0.49			0.01		
Uniform Delay, d1		44.0	3.5			44.1	3.6			40.3		
Progression Factor		1.00	1.00			0.92	2.24			1.00		
Incremental Delay, d2		31.2	0.6			37.5	0.6			0.0		
Delay (s)		75.3	4.1			78.2	8.6			40.3		
Level of Service		E	A			E	A			D		
Approach Delay (s)			5.0				9.5			40.3		
Approach LOS			A				A			D		

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	9
Future Volume (vph)	0	9
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.96	
Flt Protected	0.97	
Satd. Flow (prot)	1674	
Flt Permitted	0.78	
Satd. Flow (perm)	1349	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	0	9
RTOR Reduction (vph)	30	0
Lane Group Flow (vph)	2	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	5%	5%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	4.9	
Effective Green, g (s)	4.9	
Actuated g/C Ratio	0.05	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	73	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.02	
Uniform Delay, d1	40.3	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	40.3	
Level of Service	D	
Approach Delay (s)	40.3	
Approach LOS	D	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	132	1076	18	3	19	977	141	28	15	19	321	12
Future Volume (vph)	132	1076	18	3	19	977	141	28	15	19	321	12
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (prot)	1577	3495			1752	3505	1568		1786	1568	1498	1675
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (perm)	1577	3495			1752	3505	1568		1786	1568	1498	1675
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	136	1109	19	3	20	1007	145	29	15	20	331	12
RTOR Reduction (vph)	0	1	0	0	0	0	74	0	0	19	0	0
Lane Group Flow (vph)	136	1127	0	0	23	1007	71	0	44	1	172	171
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	11.7	54.7			2.1	44.1	44.1		3.7	3.7	12.8	12.8
Effective Green, g (s)	11.7	54.7			2.1	44.1	44.1		3.7	3.7	12.8	12.8
Actuated g/C Ratio	0.13	0.61			0.02	0.49	0.49		0.04	0.04	0.14	0.14
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	205	2124			40	1717	768		73	64	213	238
v/s Ratio Prot	c0.09	0.32			0.01	c0.29			c0.02		c0.11	0.10
v/s Ratio Perm							0.05			0.00		
v/c Ratio	0.66	0.53			0.57	0.59	0.09		0.60	0.01	0.81	0.72
Uniform Delay, d1	37.3	10.2			43.5	16.4	12.3		42.4	41.4	37.4	36.9
Progression Factor	1.18	0.66			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	0.9			11.8	1.5	0.2		9.2	0.0	18.7	8.3
Delay (s)	49.6	7.6			55.3	17.9	12.5		51.7	41.4	56.1	45.2
Level of Service	D	A			E	B	B		D	D	E	D
Approach Delay (s)		12.1				18.0			48.5			43.4
Approach LOS		B				B			D			D

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	256
Future Volume (vph)	256
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	264
RTOR Reduction (vph)	226
Lane Group Flow (vph)	38
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	12.8
Effective Green, g (s)	12.8
Actuated g/C Ratio	0.14
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	223
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.17
Uniform Delay, d1	33.9
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	34.1
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1419	0	5	1098	0	28
Future Vol, veh/h	1419	0	5	1098	0	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1542	0	5	1193	0	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1542	0	-	771
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	427	-	0	343
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	427	-	-	343
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	343	-	-	427	-
HCM Lane V/C Ratio	0.089	-	-	0.013	-
HCM Control Delay (s)	16.5	-	-	13.5	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	971	428	2	228	626	0	0	0	0	162	0
Future Volume (vph)	0	971	428	2	228	626	0	0	0	0	162	0
Ideal Flow (vphpl)	1900	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1		4.2	5.1						4.6
Lane Util. Factor		0.91	1.00		1.00	0.95						1.00
Frpb, ped/bikes		1.00	0.98		1.00	1.00						1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00						1.00
Frt		1.00	0.85		1.00	1.00						1.00
Flt Protected		1.00	1.00		0.95	1.00						0.95
Satd. Flow (prot)		5036	1533		1577	3505						1752
Flt Permitted		1.00	1.00		0.95	1.00						0.95
Satd. Flow (perm)		5036	1533		1577	3505						1752
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1033	455	2	243	666	0	0	0	0	172	0
RTOR Reduction (vph)	0	0	290	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1033	165	0	245	666	0	0	0	0	0	172
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	Prot	NA					Split	NA
Protected Phases		2		1	1	6					4	4
Permitted Phases			2									
Actuated Green, G (s)		24.5	24.5		14.6	43.3						14.6
Effective Green, g (s)		24.5	24.5		14.6	43.3						14.6
Actuated g/C Ratio		0.36	0.36		0.22	0.64						0.22
Clearance Time (s)		5.1	5.1		4.2	5.1						4.6
Vehicle Extension (s)		4.0	4.0		2.0	4.0						2.5
Lane Grp Cap (vph)		1825	555		340	2245						378
v/s Ratio Prot		c0.21			c0.16	0.19						0.10
v/s Ratio Perm			0.11									
v/c Ratio		0.57	0.30		0.72	0.30						0.46
Uniform Delay, d1		17.3	15.4		24.6	5.4						23.0
Progression Factor		1.00	1.00		1.00	1.00						1.00
Incremental Delay, d2		0.5	0.4		6.2	0.1						0.6
Delay (s)		17.8	15.8		30.8	5.5						23.7
Level of Service		B	B		C	A						C
Approach Delay (s)		17.2				12.3			0.0			30.2
Approach LOS		B				B			A			C

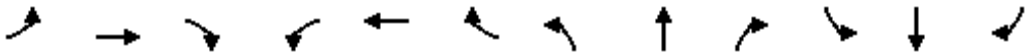
Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	13.9
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	477
Future Volume (vph)	477
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.6
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	507
RTOR Reduction (vph)	258
Lane Group Flow (vph)	249
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	14.6
Effective Green, g (s)	14.6
Actuated g/C Ratio	0.22
Clearance Time (s)	4.6
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	338
v/s Ratio Prot	
v/s Ratio Perm	c0.16
v/c Ratio	0.74
Uniform Delay, d1	24.7
Progression Factor	1.00
Incremental Delay, d2	7.7
Delay (s)	32.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	481	639	0	0	593	180	255	0	199	0	0	0
Future Volume (vph)	481	639	0	0	593	180	255	0	199	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1577	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1577	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	506	673	0	0	624	189	268	0	209	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	127	0	0	165	0	0	0
Lane Group Flow (vph)	506	673	0	0	624	62	0	268	44	0	0	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	33.3	61.2			23.7	23.7		19.1	19.1			
Effective Green, g (s)	33.3	61.2			23.7	23.7		19.1	19.1			
Actuated g/C Ratio	0.37	0.68			0.26	0.26		0.21	0.21			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	583	2383			922	412		371	332			
v/s Ratio Prot	c0.32	0.19			c0.18			c0.15				
v/s Ratio Perm						0.04			0.03			
v/c Ratio	0.87	0.28			0.68	0.15		0.72	0.13			
Uniform Delay, d1	26.3	5.7			29.7	25.4		33.0	28.7			
Progression Factor	1.00	1.00			0.98	1.42		1.00	1.00			
Incremental Delay, d2	12.5	0.3			3.7	0.7		6.9	0.2			
Delay (s)	38.8	6.0			32.7	36.8		39.9	28.9			
Level of Service	D	A			C	D		D	C			
Approach Delay (s)		20.1			33.7			35.1			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	277	547	9	1	449	91	7	1	2	101	1
Future Volume (vph)	1	277	547	9	1	449	91	7	1	2	101	1
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95
Satd. Flow (prot)		3060	3505	1568	1577	3407			1767	1534		1758
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95
Satd. Flow (perm)		3060	3505	1568	1577	3407			1767	1534		1758
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1	295	582	10	1	478	97	7	1	2	107	1
RTOR Reduction (vph)	0	0	0	4	0	10	0	0	0	2	0	0
Lane Group Flow (vph)	0	296	582	6	1	565	0	0	8	0	0	108
Confl. Peds. (#/hr)							3			9		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		11.4	57.8	57.8	0.8	46.3			5.8	5.8		8.4
Effective Green, g (s)		11.4	57.8	57.8	0.8	46.3			5.8	5.8		8.4
Actuated g/C Ratio		0.13	0.64	0.64	0.01	0.51			0.06	0.06		0.09
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		387	2250	1007	14	1752			113	98		164
v/s Ratio Prot		c0.10	0.17		0.00	c0.17			c0.00			c0.06
v/s Ratio Perm				0.00						0.00		
v/c Ratio		0.76	0.26	0.01	0.07	0.32			0.07	0.00		0.66
Uniform Delay, d1		38.0	6.9	5.8	44.2	12.7			39.6	39.4		39.4
Progression Factor		0.89	1.21	1.00	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		7.7	0.3	0.0	0.8	0.5			0.1	0.0		7.1
Delay (s)		41.5	8.6	5.8	45.0	13.2			39.7	39.4		46.5
Level of Service		D	A	A	D	B			D	D		D
Approach Delay (s)			19.6			13.3			39.6			40.1
Approach LOS			B			B			D			D

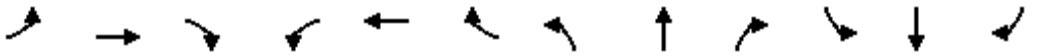
Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	310
Future Volume (vph)	310
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	330
RTOR Reduction (vph)	299
Lane Group Flow (vph)	31
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.4
Effective Green, g (s)	8.4
Actuated g/C Ratio	0.09
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	146
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.21
Uniform Delay, d1	37.7
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	38.0
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	522	2	2	449	21	7	0	2	14	0	72
Future Volume (Veh/h)	78	522	2	2	449	21	7	0	2	14	0	72
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	82	549	2	2	473	22	7	0	2	15	0	76
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.89			0.89	0.89	0.89	0.89	0.89	
vC, conflicting volume	495			551			1030	1213	551	1205	1203	248
vC1, stage 1 conf vol							714	714		488	488	
vC2, stage 2 conf vol							316	499		717	715	
vCu, unblocked vol	495			437			974	1178	437	1169	1167	248
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			98	100	100	95	100	90
cM capacity (veh/h)	1058			993			318	323	504	308	338	750

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	633	238	258	9	15	76
Volume Left	82	2	0	7	15	0
Volume Right	2	0	22	2	0	76
cSH	1058	993	1700	347	308	750
Volume to Capacity	0.08	0.00	0.15	0.03	0.05	0.10
Queue Length 95th (ft)	6	0	0	2	4	8
Control Delay (s)	2.0	0.1	0.0	15.7	17.3	10.3
Lane LOS	A	A		C	C	B
Approach Delay (s)	2.0	0.0		15.7	11.5	
Approach LOS				C	B	

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	61.7%	ICU Level of Service		B
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	516	20	2	417	53	7
Future Vol, veh/h	516	20	2	417	53	7
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	543	21	2	439	56	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	565	0	998	555
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	443	-
Critical Hdwy	-	-	4.14	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.236	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	997	-	268	527
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	997	-	267	526
Mov Cap-2 Maneuver	-	-	-	-	267	-
Stage 1	-	-	-	-	570	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	21.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	-	-	997	-
HCM Lane V/C Ratio	0.223	-	-	0.002	-
HCM Control Delay (s)	21.3	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	510	8	3	417	3	3	0	1	2	0	3
Future Vol, veh/h	10	510	8	3	417	3	3	0	1	2	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	537	8	3	439	3	3	0	1	2	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	442	0	0	545	0	0	1010	1010	541	1010	1013	441
Stage 1	-	-	-	-	-	-	562	562	-	447	447	-
Stage 2	-	-	-	-	-	-	448	448	-	563	566	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1118	-	-	1024	-	-	218	240	541	218	239	616
Stage 1	-	-	-	-	-	-	512	510	-	591	573	-
Stage 2	-	-	-	-	-	-	590	573	-	511	507	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1118	-	-	1024	-	-	214	236	541	215	235	616
Mov Cap-2 Maneuver	-	-	-	-	-	-	214	236	-	215	235	-
Stage 1	-	-	-	-	-	-	505	503	-	583	571	-
Stage 2	-	-	-	-	-	-	585	571	-	503	500	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	19.5	15.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	252	1118	-	-	1024	-	-	353
HCM Lane V/C Ratio	0.017	0.009	-	-	0.003	-	-	0.015
HCM Control Delay (s)	19.5	8.3	0	-	8.5	0	-	15.4
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	160	350	298	57	71	125
Future Vol, veh/h	160	350	298	57	71	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	178	389	331	63	79	139

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	394	0	-	0	1107	363
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	744	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1165	-	-	-	233	682
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	470	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1165	-	-	-	197	682
Mov Cap-2 Maneuver	-	-	-	-	197	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	398	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	29.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1165	-	-	-	360
HCM Lane V/C Ratio	0.153	-	-	-	0.605
HCM Control Delay (s)	8.6	-	-	-	29.2
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.5	-	-	-	3.8

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	304	139	108	41	34	228
Future Vol, veh/h	304	139	108	41	34	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	349	160	124	47	39	262

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	171	0	-	0	1007	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	859	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1406	-	-	-	267	899
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	415	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1406	-	-	-	201	899
Mov Cap-2 Maneuver	-	-	-	-	201	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	312	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1406	-	-	-	620
HCM Lane V/C Ratio	0.249	-	-	-	0.486
HCM Control Delay (s)	8.4	-	-	-	16.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	1	-	-	-	2.7

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	267	255	22	18	27
Future Vol, veh/h	38	267	255	22	18	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	275	263	23	19	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	286	0	-	0	628	274
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	354	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1276	-	-	-	447	765
Stage 1	-	-	-	-	772	-
Stage 2	-	-	-	-	710	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1276	-	-	-	431	765
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	772	-
Stage 2	-	-	-	-	684	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1276	-	-	-	584
HCM Lane V/C Ratio	0.031	-	-	-	0.079
HCM Control Delay (s)	7.9	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

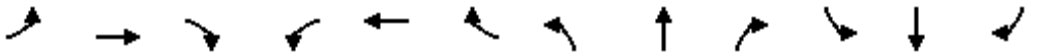
Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	92	158	207	49	41	76
Future Vol, veh/h	92	158	207	49	41	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	165	216	51	43	79

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	216	0	-	0	572	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	356	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1354	-	-	-	482	824
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	709	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1354	-	-	-	448	824
Mov Cap-2 Maneuver	-	-	-	-	448	-
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	659	-

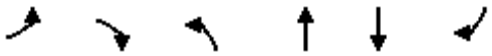
Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1354	-	-	-	637
HCM Lane V/C Ratio	0.071	-	-	-	0.191
HCM Control Delay (s)	7.9	-	-	-	12
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	3	57	9	10	14	126	387	10	9	405	144
Future Volume (vph)	97	3	57	9	10	14	126	387	10	9	405	144
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1595		1593	1703		1593	1855		1593	1863	1550
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1595		1593	1703		1593	1855		1593	1863	1550
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	113	3	66	10	12	16	147	450	12	10	471	167
RTOR Reduction (vph)	0	56	0	0	15	0	0	1	0	0	0	96
Lane Group Flow (vph)	113	13	0	10	13	0	147	461	0	10	471	71
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	6.3	8.4		0.7	2.8		5.5	29.0		0.7	24.2	24.2
Effective Green, g (s)	6.3	8.4		0.7	2.8		5.5	29.0		0.7	24.2	24.2
Actuated g/C Ratio	0.11	0.15		0.01	0.05		0.10	0.51		0.01	0.43	0.43
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	176	235		19	83		154	947		19	793	660
v/s Ratio Prot	c0.07	0.01		0.01	c0.01		c0.09	0.25		0.01	c0.25	
v/s Ratio Perm												0.05
v/c Ratio	0.64	0.05		0.53	0.15		0.95	0.49		0.53	0.59	0.11
Uniform Delay, d1	24.2	20.8		27.9	25.9		25.5	9.1		27.9	12.5	9.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.8	0.1		23.9	0.9		58.5	0.4		23.9	1.2	0.1
Delay (s)	31.9	20.9		51.7	26.7		84.0	9.4		51.7	13.7	9.9
Level of Service	C	C		D	C		F	A		D	B	A
Approach Delay (s)		27.7			33.3			27.5			13.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	42	55	11	270	476	10
Future Volume (vph)	42	55	11	270	476	10
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3527	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3527	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	48	63	13	310	547	11
RTOR Reduction (vph)	0	56	0	0	1	0
Lane Group Flow (vph)	48	7	13	310	557	0
Confl. Peds. (#/hr)						1
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	4.8	4.8	1.0	26.8	22.3	
Effective Green, g (s)	4.8	4.8	1.0	26.8	22.3	
Actuated g/C Ratio	0.12	0.12	0.02	0.66	0.55	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	189	188	39	1235	1946	
v/s Ratio Prot	c0.03		0.01	c0.17	c0.16	
v/s Ratio Perm		0.00				
v/c Ratio	0.25	0.04	0.33	0.25	0.29	
Uniform Delay, d1	16.2	15.8	19.4	2.7	4.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.0	1.8	0.2	0.2	
Delay (s)	16.4	15.8	21.2	3.0	5.0	
Level of Service	B	B	C	A	A	
Approach Delay (s)	16.1			3.7	5.0	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	40.4	Sum of lost time (s)	12.3
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	5	297	12	3	467
Future Vol, veh/h	11	5	297	12	3	467
Conflicting Peds, #/hr	0	1	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	6	367	15	4	577

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	959	376	0	0	382	0
Stage 1	375	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	285	670	-	-	1176	-
Stage 1	695	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	283	669	-	-	1175	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	464	1175	-
HCM Lane V/C Ratio	-	-	0.043	0.003	-
HCM Control Delay (s)	-	-	13.1	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	28	299	15	43	475
Future Vol, veh/h	13	28	299	15	43	475
Conflicting Peds, #/hr	0	2	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	33	352	18	51	559

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1023	365	0	0	371	0
Stage 1	363	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	261	680	-	-	1188	-
Stage 1	704	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	244	677	-	-	1186	-
Mov Cap-2 Maneuver	366	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	482	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	533	1186	-
HCM Lane V/C Ratio	-	-	0.09	0.043	-
HCM Control Delay (s)	-	-	12.4	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

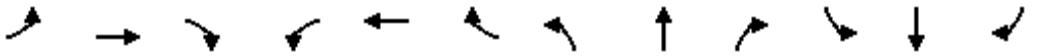
Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	2	1	55	1	33	2	304	33	72	514	14
Future Vol, veh/h	4	2	1	55	1	33	2	304	33	72	514	14
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	2	1	64	1	38	2	353	38	84	598	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1174	1174	610	1156	1162	377	616	0	0	394	0	0
Stage 1	775	775	-	379	379	-	-	-	-	-	-	-
Stage 2	399	399	-	777	783	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	169	192	494	174	195	670	964	-	-	1165	-	-
Stage 1	391	408	-	643	615	-	-	-	-	-	-	-
Stage 2	627	602	-	390	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	144	170	492	156	172	667	962	-	-	1163	-	-
Mov Cap-2 Maneuver	144	170	-	156	172	-	-	-	-	-	-	-
Stage 1	389	362	-	640	612	-	-	-	-	-	-	-
Stage 2	587	599	-	343	359	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.5	35.6	0.1	1
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	962	-	-	168	218	1163	-	-
HCM Lane V/C Ratio	0.002	-	-	0.048	0.475	0.072	-	-
HCM Control Delay (s)	8.8	0	-	27.5	35.6	8.3	0	-
HCM Lane LOS	A	A	-	D	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.3	0.2	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	358	263	236	289	104	128	253	161	160	268	42
Future Volume (vph)	40	358	263	236	289	104	128	253	161	160	268	42
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1557	1593	3539	1563	1593	3313		1593	3459	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1557	1593	3539	1563	1593	3313		1593	3459	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	398	292	262	321	116	142	281	179	178	298	47
RTOR Reduction (vph)	0	0	224	0	0	71	0	102	0	0	13	0
Lane Group Flow (vph)	44	398	68	262	321	45	142	358	0	178	332	0
Confl. Peds. (#/hr)			3						2			2
Confl. Bikes (#/hr)			2			2			1			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.5	20.0	20.0	17.5	33.0	33.0	12.4	17.3		13.8	18.7	
Effective Green, g (s)	4.5	20.0	20.0	17.5	33.0	33.0	12.4	17.3		13.8	18.7	
Actuated g/C Ratio	0.05	0.23	0.23	0.20	0.39	0.39	0.14	0.20		0.16	0.22	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	83	826	363	325	1364	602	230	669		256	755	
v/s Ratio Prot	0.03	c0.11		c0.16	0.09		0.09	c0.11		c0.11	0.10	
v/s Ratio Perm			0.04			0.03						
v/c Ratio	0.53	0.48	0.19	0.81	0.24	0.07	0.62	0.53		0.70	0.44	
Uniform Delay, d1	39.5	28.3	26.3	32.4	17.8	16.6	34.4	30.6		33.9	28.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.9	0.5	12.8	0.2	0.1	3.4	1.5		6.5	0.9	
Delay (s)	42.7	29.3	26.8	45.3	18.0	16.7	37.8	32.1		40.4	29.8	
Level of Service	D	C	C	D	B	B	D	C		D	C	
Approach Delay (s)		29.1			28.0			33.4			33.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	6	1	3	17	370	449	7
Future Vol, veh/h	6	1	3	17	370	449	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	145	-	-	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	7	1	3	18	402	488	8

Major/Minor	Minor2		Major1			Major2	
Conflicting Flow All	737	248	495	496	0	-	0
Stage 1	492	-	-	-	-	-	-
Stage 2	245	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	2.22	-	-	-
Pot Cap-1 Maneuver	354	752	697	1064	-	-	-
Stage 1	580	-	-	-	-	-	-
Stage 2	773	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	354	752	986	986	-	-	-
Mov Cap-2 Maneuver	354	-	-	-	-	-	-
Stage 1	580	-	-	-	-	-	-
Stage 2	773	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	986	-	383	-	-
HCM Lane V/C Ratio	0.022	-	0.02	-	-
HCM Control Delay (s)	8.7	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	18	374	5	50	444
Future Vol, veh/h	7	18	374	5	50	444
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	20	411	5	55	488

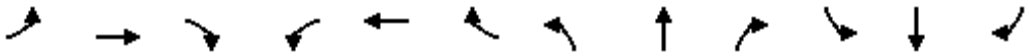
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	768	208	0	0	416	0
Stage 1	414	-	-	-	-	-
Stage 2	354	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	338	798	-	-	1139	-
Stage 1	635	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	316	798	-	-	1139	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	636	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	646	1139	-
HCM Lane V/C Ratio	-	-	0.043	0.048	-
HCM Control Delay (s)	-	-	10.8	8.3	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	7	54	2	4	15	30	341	9	18	461	81
Future Volume (vph)	72	7	54	2	4	15	30	341	9	18	461	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.90		1.00	1.00		1.00	0.98	
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1688			1628		1577	3489		1577	3414	
Flt Permitted		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1688			1628		1577	3489		1577	3414	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	77	8	58	2	4	16	32	367	10	19	496	87
RTOR Reduction (vph)	0	28	0	0	16	0	0	2	0	0	12	0
Lane Group Flow (vph)	0	115	0	0	6	0	32	375	0	19	571	0
Confl. Peds. (#/hr)			1						1			4
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		8.6			0.7		2.2	25.2		0.8	23.8	
Effective Green, g (s)		8.6			0.7		2.2	25.2		0.8	23.8	
Actuated g/C Ratio		0.17			0.01		0.04	0.49		0.02	0.46	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		280			22		66	1697		24	1568	
v/s Ratio Prot		c0.07			c0.00		c0.02	0.11		0.01	c0.17	
v/s Ratio Perm												
v/c Ratio		0.41			0.28		0.48	0.22		0.79	0.36	
Uniform Delay, d1		19.3			25.3		24.2	7.7		25.4	9.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			2.6		2.0	0.1		90.1	0.3	
Delay (s)		19.7			27.9		26.3	7.8		115.5	9.4	
Level of Service		B			C		C	A		F	A	
Approach Delay (s)		19.7			27.9			9.2			12.7	
Approach LOS		B			C			A			B	

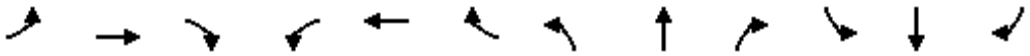
Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	0	19	12	0	1	19	557	3	23	662	32
Future Volume (vph)	27	0	19	12	0	1	19	557	3	23	662	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.99		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1700			1763		1593	3536		1593	3510	
Flt Permitted		0.81			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1418			1845		1593	3536		1593	3510	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	29	0	20	13	0	1	20	593	3	24	704	34
RTOR Reduction (vph)	0	44	0	0	14	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	5	0	0	0	0	20	596	0	24	736	0
Confl. Peds. (#/hr)			4						4			6
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		5.0			0.5		0.8	30.4		0.8	30.4	
Effective Green, g (s)		5.0			0.5		0.8	30.4		0.8	30.4	
Actuated g/C Ratio		0.09			0.01		0.02	0.57		0.02	0.57	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		133			17		23	2020		23	2005	
v/s Ratio Prot							0.01	0.17		c0.02	c0.21	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.03			0.01		0.87	0.30		1.04	0.37	
Uniform Delay, d1		21.9			26.1		26.1	5.9		26.2	6.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.1		124.8	0.3		201.7	0.4	
Delay (s)		21.9			26.2		151.0	6.1		227.9	6.5	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		21.9			26.2			10.8			13.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	446	99	189	380	262	99	373	171	348	506	141
Future Volume (vph)	166	446	99	189	380	262	99	373	171	348	506	141
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1544	1593	3539	1545	1593	3341		1593	3402	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1544	1593	3539	1545	1593	3341		1593	3402	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	175	469	104	199	400	276	104	393	180	366	533	148
RTOR Reduction (vph)	0	0	76	0	0	197	0	37	0	0	16	0
Lane Group Flow (vph)	175	469	28	199	400	79	104	536	0	366	665	0
Confl. Peds. (#/hr)			11			10			14			15
Confl. Bikes (#/hr)			2			3			2			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	11.2	24.3	24.3	18.9	32.0	32.0	11.7	25.5		27.1	40.6	
Effective Green, g (s)	11.2	24.3	24.3	18.9	32.0	32.0	11.7	25.5		27.1	40.6	
Actuated g/C Ratio	0.10	0.22	0.22	0.17	0.29	0.29	0.10	0.23		0.24	0.36	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	309	767	334	268	1011	441	166	760		385	1233	
v/s Ratio Prot	0.06	c0.13		c0.12	0.11		0.07	c0.16		c0.23	0.20	
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.57	0.61	0.08	0.74	0.40	0.18	0.63	0.71		0.95	0.54	
Uniform Delay, d1	48.1	39.6	35.0	44.2	32.2	30.1	48.1	39.8		41.8	28.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	2.1	0.2	9.3	0.5	0.4	5.2	3.7		33.0	0.8	
Delay (s)	49.5	41.7	35.2	53.6	32.7	30.5	53.3	43.5		74.8	29.1	
Level of Service	D	D	D	D	C	C	D	D		E	C	
Approach Delay (s)		42.6			36.8			45.0			45.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	1	1	34	62	297	50	134	1	39	361	313	1
Future Volume (vph)	1	1	34	62	297	50	134	1	39	361	313	1
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710
Total Lost time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.93	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1593	3539	1562	3090	1644	1504		1593	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1593	3539	1562	3090	1644	1504		1593	3539	1583	
Peak-hour factor, PHF	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.97	0.97	0.97	0.92
Adj. Flow (vph)	1	1	35	64	306	52	138	1	40	372	323	1
RTOR Reduction (vph)	0	0	0	54	0	24	69	0	0	0	172	0
Lane Group Flow (vph)	0	2	35	10	306	75	22	0	41	372	151	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)				1								
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot
Protected Phases	8	8	8		7	7		1	1	6	7	5
Permitted Phases				8			7				6	
Actuated Green, G (s)		14.2	14.2	14.2	21.9	21.9	21.9		6.3	20.3	42.2	
Effective Green, g (s)		14.2	14.2	14.2	21.9	21.9	21.9		6.3	20.3	42.2	
Actuated g/C Ratio		0.16	0.16	0.16	0.24	0.24	0.24		0.07	0.23	0.47	
Clearance Time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	
Lane Grp Cap (vph)		251	557	246	751	399	365		111	797	741	
v/s Ratio Prot		0.00	c0.01		c0.10	0.05			0.03	c0.11	0.05	
v/s Ratio Perm				0.01			0.01				0.05	
v/c Ratio		0.01	0.06	0.04	0.41	0.19	0.06		0.37	0.47	0.20	
Uniform Delay, d1		32.0	32.3	32.2	28.6	27.0	26.2		40.0	30.2	14.1	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.0	0.0	0.1	0.4	0.2	0.1		2.1	0.9	0.1	
Delay (s)		32.0	32.3	32.2	29.0	27.3	26.3		42.1	31.1	14.2	
Level of Service		C	C	C	C	C	C		D	C	B	
Approach Delay (s)			32.3			28.2				24.3		
Approach LOS			C			C				C		

Intersection Summary			
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	20.1
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	162	386	9
Future Volume (vph)	162	386	9
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.1	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3090	3539	1538
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3090	3539	1538
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	167	398	9
RTOR Reduction (vph)	0	0	6
Lane Group Flow (vph)	168	398	3
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	13.6	27.6	27.6
Effective Green, g (s)	13.6	27.6	27.6
Actuated g/C Ratio	0.15	0.31	0.31
Clearance Time (s)	4.1	6.5	6.5
Vehicle Extension (s)	3.0	5.0	5.0
Lane Grp Cap (vph)	466	1084	471
v/s Ratio Prot	c0.05	0.11	
v/s Ratio Perm			0.00
v/c Ratio	0.36	0.37	0.01
Uniform Delay, d1	34.3	24.4	21.7
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.4	0.0
Delay (s)	34.8	24.9	21.7
Level of Service	C	C	C
Approach Delay (s)		27.7	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	17	26	415	51	3	219	434	37	1	68	27	271
Future Volume (vph)	17	26	415	51	3	219	434	37	1	68	27	271
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1710	1900	1900
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00		1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	3505	1568		1577	3505	1568		1577	1845	1568
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1583	3505	1568		1577	3505	1568		1577	1845	1568
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Adj. Flow (vph)	18	29	456	56	3	241	477	41	1	75	30	298
RTOR Reduction (vph)	0	0	0	37	0	0	0	20	0	0	0	262
Lane Group Flow (vph)	0	47	456	19	0	244	477	21	0	76	30	36
Heavy Vehicles (%)	2%	3%	3%	3%	2%	3%	3%	3%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	Split	NA	Perm
Protected Phases	5	5	2		1	1	6		3	3	3	
Permitted Phases				2				6				3
Actuated Green, G (s)		4.4	24.2	24.2		16.6	36.4	36.4		8.8	8.8	8.8
Effective Green, g (s)		4.4	24.2	24.2		16.6	36.4	36.4		8.8	8.8	8.8
Actuated g/C Ratio		0.06	0.33	0.33		0.23	0.50	0.50		0.12	0.12	0.12
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0		2.0	2.0	2.0
Lane Grp Cap (vph)		95	1166	521		360	1754	785		190	223	189
v/s Ratio Prot		0.03	c0.13			c0.15	0.14			c0.05	0.02	
v/s Ratio Perm				0.01				0.01				0.02
v/c Ratio		0.49	0.39	0.04		0.68	0.27	0.03		0.40	0.13	0.19
Uniform Delay, d1		33.1	18.6	16.4		25.6	10.5	9.2		29.5	28.5	28.7
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		1.5	0.9	0.1		4.0	0.4	0.1		0.5	0.1	0.2
Delay (s)		34.5	19.5	16.5		29.6	10.9	9.2		30.0	28.6	28.9
Level of Service		C	B	B		C	B	A		C	C	C
Approach Delay (s)			20.5				16.8				29.1	
Approach LOS			C				B				C	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	17.5
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	41	30	17
Future Volume (vph)	41	30	17
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.5	4.5	
Lane Util. Factor	1.00	1.00	
Frt	1.00	0.95	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1577	1744	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1577	1744	
Peak-hour factor, PHF	0.91	0.91	0.91
Adj. Flow (vph)	45	33	19
RTOR Reduction (vph)	0	17	0
Lane Group Flow (vph)	45	35	0
Heavy Vehicles (%)	3%	3%	3%
Turn Type	Split	NA	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)	5.6	5.6	
Effective Green, g (s)	5.6	5.6	
Actuated g/C Ratio	0.08	0.08	
Clearance Time (s)	4.5	4.5	
Vehicle Extension (s)	2.0	2.0	
Lane Grp Cap (vph)	121	134	
v/s Ratio Prot	c0.03	0.02	
v/s Ratio Perm			
v/c Ratio	0.37	0.26	
Uniform Delay, d1	31.9	31.6	
Progression Factor	1.00	1.00	
Incremental Delay, d2	0.7	0.4	
Delay (s)	32.6	32.0	
Level of Service	C	C	
Approach Delay (s)		32.3	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	50	677	0	2	2	642	141	1	2	0	136
Future Volume (vph)	2	50	677	0	2	2	642	141	1	2	0	136
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		1.00		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (prot)		1593	3539			1593	3539	1550		1832		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (perm)		1593	3539			1593	3539	1550		1832		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2	52	705	0	2	2	669	147	1	2	0	142
RTOR Reduction (vph)	0	0	0	0	0	0	0	84	0	0	0	0
Lane Group Flow (vph)	0	54	705	0	0	4	669	63	0	3	0	0
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.1	29.8			0.7	26.0	26.0		0.7		
Effective Green, g (s)		4.1	29.8			0.7	26.0	26.0		0.7		
Actuated g/C Ratio		0.07	0.49			0.01	0.43	0.43		0.01		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		108	1746			18	1523	667		21		
v/s Ratio Prot		c0.03	c0.20			0.00	0.19			c0.00		
v/s Ratio Perm								0.04				
v/c Ratio		0.50	0.40			0.22	0.44	0.09		0.14		
Uniform Delay, d1		27.2	9.7			29.6	12.1	10.2		29.6		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		1.3	0.6			2.3	0.8	0.2		1.1		
Delay (s)		28.5	10.3			31.9	12.8	10.4		30.7		
Level of Service		C	B			C	B	B		C		
Approach Delay (s)			11.6				12.5			30.7		
Approach LOS			B				B			C		

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	60.4	Sum of lost time (s)	18.2
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	2	46
Future Volume (vph)	2	46
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.96	
Satd. Flow (prot)	1736	
Flt Permitted	0.96	
Satd. Flow (perm)	1736	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	2	48
RTOR Reduction (vph)	11	0
Lane Group Flow (vph)	181	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	11.4	
Effective Green, g (s)	11.4	
Actuated g/C Ratio	0.19	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	327	
v/s Ratio Prot	c0.10	
v/s Ratio Perm		
v/c Ratio	0.55	
Uniform Delay, d1	22.2	
Progression Factor	1.00	
Incremental Delay, d2	1.2	
Delay (s)	23.4	
Level of Service	C	
Approach Delay (s)	23.4	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	10	796	8	4	11	737	24	3	0	10	23
Future Volume (vph)	1	10	796	8	4	11	737	24	3	0	10	23
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	1.00			0.90		
Flt Protected		0.95	1.00			0.95	1.00			0.99		
Satd. Flow (prot)		1593	3534			1593	3520			1650		
Flt Permitted		0.95	1.00			0.95	1.00			1.00		
Satd. Flow (perm)		1593	3534			1593	3520			1669		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	10	829	8	4	11	768	25	3	0	10	24
RTOR Reduction (vph)	0	0	1	0	0	0	1	0	0	12	0	0
Lane Group Flow (vph)	0	11	836	0	0	15	792	0	0	1	0	0
Confl. Bikes (#/hr)								2				
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		1.0	34.6			1.1	34.7			2.4		
Effective Green, g (s)		1.0	34.6			1.1	34.7			2.4		
Actuated g/C Ratio		0.02	0.67			0.02	0.67			0.05		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		30	2360			33	2357			77		
v/s Ratio Prot		0.01	c0.24			c0.01	0.22					
v/s Ratio Perm										0.00		
v/c Ratio		0.37	0.35			0.45	0.34			0.01		
Uniform Delay, d1		25.1	3.7			25.1	3.6			23.6		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		2.8	0.3			3.6	0.3			0.0		
Delay (s)		27.8	4.1			28.6	4.0			23.6		
Level of Service		C	A			C	A			C		
Approach Delay (s)			4.4				4.4			23.6		
Approach LOS			A				A			C		

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	13.7
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	21
Future Volume (vph)	0	21
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.94	
Flt Protected	0.97	
Satd. Flow (prot)	1698	
Flt Permitted	1.00	
Satd. Flow (perm)	1742	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	0	22
RTOR Reduction (vph)	44	0
Lane Group Flow (vph)	2	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	2.4	
Effective Green, g (s)	2.4	
Actuated g/C Ratio	0.05	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	80	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.03	
Uniform Delay, d1	23.6	
Progression Factor	1.00	
Incremental Delay, d2	0.0	
Delay (s)	23.6	
Level of Service	C	
Approach Delay (s)	23.6	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	106	699	6	4	7	635	104	7	11	8	1	116
Future Volume (vph)	106	699	6	4	7	635	104	7	11	8	1	116
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1710
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00		0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (prot)	1593	3534			1593	3539	1564		1827	1583		1513
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (perm)	1593	3534			1593	3539	1564		1827	1583		1513
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	110	728	6	4	7	661	108	7	11	8	1	121
RTOR Reduction (vph)	0	0	0	0	0	0	45	0	0	8	0	0
Lane Group Flow (vph)	110	734	0	0	11	661	63	0	18	0	0	64
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			1				1					
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	Split
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	9.1	61.9			1.0	52.8	52.8		1.9	1.9		8.5
Effective Green, g (s)	9.1	61.9			1.0	52.8	52.8		1.9	1.9		8.5
Actuated g/C Ratio	0.10	0.69			0.01	0.59	0.59		0.02	0.02		0.09
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2		0.2
Lane Grp Cap (vph)	161	2430			17	2076	917		38	33		142
v/s Ratio Prot	c0.07	0.21			0.01	c0.19			c0.01			c0.04
v/s Ratio Perm							0.04			0.00		
v/c Ratio	0.68	0.30			0.65	0.32	0.07		0.47	0.01		0.45
Uniform Delay, d1	39.1	5.5			44.3	9.5	8.0		43.6	43.1		38.5
Progression Factor	1.00	1.00			1.28	0.68	0.68		1.00	1.00		1.00
Incremental Delay, d2	9.2	0.3			47.2	0.4	0.1		3.4	0.0		0.8
Delay (s)	48.2	5.9			104.0	6.8	5.6		46.9	43.1		39.4
Level of Service	D	A			F	A	A		D	D		D
Approach Delay (s)		11.4				8.0			45.8			
Approach LOS		B				A			D			

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	7	140
Future Volume (vph)	7	140
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.4	4.4
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.96	1.00
Satd. Flow (prot)	1694	1557
Flt Permitted	0.96	1.00
Satd. Flow (perm)	1694	1557
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	7	146
RTOR Reduction (vph)	0	132
Lane Group Flow (vph)	65	14
Confl. Peds. (#/hr)		2
Confl. Bikes (#/hr)		1
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	8.5	8.5
Effective Green, g (s)	8.5	8.5
Actuated g/C Ratio	0.09	0.09
Clearance Time (s)	4.4	4.4
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	159	147
v/s Ratio Prot	0.04	
v/s Ratio Perm		0.01
v/c Ratio	0.41	0.09
Uniform Delay, d1	38.4	37.2
Progression Factor	1.00	1.00
Incremental Delay, d2	0.6	0.1
Delay (s)	39.0	37.3
Level of Service	D	D
Approach Delay (s)	38.2	
Approach LOS	D	

Intersection Summary

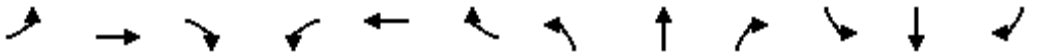
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	814	3	1	34	751	0	32
Future Vol, veh/h	814	3	1	34	751	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	831	3	1	35	766	0	33

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	833	834	0	-	417
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.44	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.52	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	425	795	-	0	585
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	773	773	-	-	585
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-

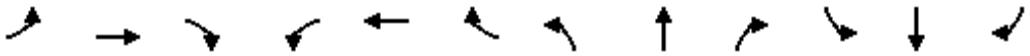
Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	585	-	-	773	-
HCM Lane V/C Ratio	0.056	-	-	0.046	-
HCM Control Delay (s)	11.5	-	-	9.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



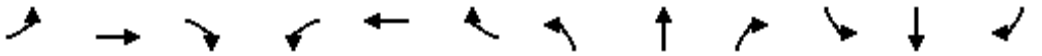
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	660	178	147	448	0	0	0	0	95	1	344
Future Volume (vph)	0	660	178	147	448	0	0	0	0	95	1	344
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		5085	1549	1593	3539						1775	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		5085	1549	1593	3539						1775	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	673	182	150	457	0	0	0	0	97	1	351
RTOR Reduction (vph)	0	0	75	0	0	0	0	0	0	0	0	310
Lane Group Flow (vph)	0	673	107	150	457	0	0	0	0	0	98	41
Confl. Peds. (#/hr)			1									
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		52.7	52.7	12.8	69.7						10.6	10.6
Effective Green, g (s)		52.7	52.7	12.8	69.7						10.6	10.6
Actuated g/C Ratio		0.59	0.59	0.14	0.77						0.12	0.12
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2977	907	226	2740						209	186
v/s Ratio Prot		c0.13		c0.09	0.13						c0.06	
v/s Ratio Perm			0.07									0.03
v/c Ratio		0.23	0.12	0.66	0.17						0.47	0.22
Uniform Delay, d1		8.9	8.3	36.6	2.6						37.1	36.0
Progression Factor		0.73	0.44	0.81	0.66						1.00	1.00
Incremental Delay, d2		0.2	0.3	5.4	0.1						1.2	0.4
Delay (s)		6.7	3.9	35.1	1.9						38.3	36.4
Level of Service		A	A	D	A						D	D
Approach Delay (s)		6.1			10.1			0.0			36.8	
Approach LOS		A			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	372	381	0	0	422	142	172	4	161	0	0	0
Future Volume (vph)	372	381	0	0	422	142	172	4	161	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1593	3539			3539	1549		1776	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1593	3539			3539	1549		1776	1583			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	388	397	0	0	440	148	179	4	168	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	89	0	0	140	0	0	0
Lane Group Flow (vph)	388	397	0	0	440	59	0	183	28	0	0	0
Confl. Peds. (#/hr)			3			1						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	25.5	65.4			35.7	35.7		14.9	14.9			
Effective Green, g (s)	25.5	65.4			35.7	35.7		14.9	14.9			
Actuated g/C Ratio	0.28	0.73			0.40	0.40		0.17	0.17			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	451	2571			1403	614		294	262			
v/s Ratio Prot	c0.24	0.11			c0.12			c0.10				
v/s Ratio Perm						0.04			0.02			
v/c Ratio	0.86	0.15			0.31	0.10		0.62	0.11			
Uniform Delay, d1	30.6	3.8			18.7	17.0		34.9	31.9			
Progression Factor	0.80	1.57			1.14	2.04		1.00	1.00			
Incremental Delay, d2	14.7	0.1			0.6	0.3		4.1	0.2			
Delay (s)	39.2	6.1			21.9	35.0		39.1	32.1			
Level of Service	D	A			C	D		D	C			
Approach Delay (s)		22.4			25.2			35.7			0.0	
Approach LOS		C			C			D			A	

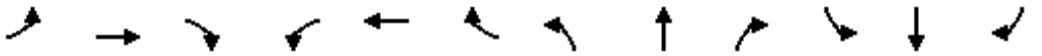
Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	327	3	1	357	66	3	3	1	62	4	204
Future Volume (vph)	206	327	3	1	357	66	3	3	1	62	4	204
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.95	1.00
Satd. Flow (prot)	3090	3539	1548	1593	3449			1817	1563		1779	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.95	1.00
Satd. Flow (perm)	3090	3539	1548	1593	3449			1817	1563		1779	1560
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	219	348	3	1	380	70	3	3	1	66	4	217
RTOR Reduction (vph)	0	0	1	0	8	0	0	0	1	0	0	201
Lane Group Flow (vph)	219	348	2	1	442	0	0	6	0	0	70	16
Confl. Peds. (#/hr)			1			1			1			
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2						3			4
Actuated Green, G (s)	9.2	60.3	60.3	0.8	51.0			5.0	5.0		6.7	6.7
Effective Green, g (s)	9.2	60.3	60.3	0.8	51.0			5.0	5.0		6.7	6.7
Actuated g/C Ratio	0.10	0.67	0.67	0.01	0.57			0.06	0.06		0.07	0.07
Clearance Time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Vehicle Extension (s)	0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	315	2371	1037	14	1954			100	86		132	116
v/s Ratio Prot	c0.07	0.10		0.00	c0.13			c0.00			c0.04	
v/s Ratio Perm			0.00						0.00			0.01
v/c Ratio	0.70	0.15	0.00	0.07	0.23			0.06	0.00		0.53	0.14
Uniform Delay, d1	39.0	5.4	4.9	44.2	9.7			40.3	40.1		40.1	39.0
Progression Factor	0.83	1.60	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.2	0.1	0.0	0.8	0.3			0.1	0.0		2.0	0.2
Delay (s)	37.7	8.8	4.9	45.0	10.0			40.4	40.1		42.2	39.2
Level of Service	D	A	A	D	A			D	D		D	D
Approach Delay (s)		19.9			10.0			40.3			39.9	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	319	1	0	329	23	7	0	1	10	0	80
Future Volume (Veh/h)	69	319	1	0	329	23	7	0	1	10	0	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	72	332	1	0	343	24	7	0	1	10	0	83
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	367			333			731	844	332	832	832	184
vC1, stage 1 conf vol							476	476		355	355	
vC2, stage 2 conf vol							254	367		478	477	
vCu, unblocked vol	367			259			682	802	258	790	790	184
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			98	100	100	98	100	90
cM capacity (veh/h)	1188			1225			444	439	696	448	459	827

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	405	172	196	8	10	83
Volume Left	72	0	0	7	10	0
Volume Right	1	0	24	1	0	83
cSH	1188	1225	1700	465	448	827
Volume to Capacity	0.06	0.00	0.12	0.02	0.02	0.10
Queue Length 95th (ft)	5	0	0	1	2	8
Control Delay (s)	2.0	0.0	0.0	12.9	13.2	9.8
Lane LOS	A			B	B	A
Approach Delay (s)	2.0	0.0		12.9	10.2	
Approach LOS				B	B	

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	46.6%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	315	9	5	339	14	4
Future Vol, veh/h	315	9	5	339	14	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	332	9	5	357	15	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	703	336
Stage 1	-	-	-	-	336	-
Stage 2	-	-	-	-	367	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1218	-	404	706
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1218	-	402	706
Mov Cap-2 Maneuver	-	-	-	-	402	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	697	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	445	-	-	1218	-
HCM Lane V/C Ratio	0.043	-	-	0.004	-
HCM Control Delay (s)	13.4	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	305	6	1	331	12	1	3	2	13	2	9
Future Vol, veh/h	13	305	6	1	331	12	1	3	2	13	2	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	328	6	1	356	13	1	3	2	14	2	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	369	0	0	334	0	0	729	730	331	727	727	362
Stage 1	-	-	-	-	-	-	359	359	-	365	365	-
Stage 2	-	-	-	-	-	-	370	371	-	362	362	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1190	-	-	1225	-	-	338	349	711	339	351	683
Stage 1	-	-	-	-	-	-	659	627	-	654	623	-
Stage 2	-	-	-	-	-	-	650	620	-	657	625	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1190	-	-	1225	-	-	328	344	711	332	346	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	328	344	-	332	346	-
Stage 1	-	-	-	-	-	-	650	618	-	645	622	-
Stage 2	-	-	-	-	-	-	638	619	-	642	616	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	13.9	14.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	411	1190	-	-	1225	-	-	413
HCM Lane V/C Ratio	0.016	0.012	-	-	0.001	-	-	0.062
HCM Control Delay (s)	13.9	8.1	0	-	7.9	0	-	14.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	103	216	227	47	48	114
Future Vol, veh/h	103	216	227	47	48	114
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	248	261	54	55	131

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	315	0	-	0	773	288
Stage 1	-	-	-	-	288	-
Stage 2	-	-	-	-	485	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1245	-	-	-	367	751
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1245	-	-	-	332	751
Mov Cap-2 Maneuver	-	-	-	-	332	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1245	-	-	-	547
HCM Lane V/C Ratio	0.095	-	-	-	0.34
HCM Control Delay (s)	8.2	-	-	-	14.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.5

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	153	119	102	16	13	174
Future Vol, veh/h	153	119	102	16	13	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	172	134	115	18	15	196

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	133	0	-	0	602	124
Stage 1	-	-	-	-	124	-
Stage 2	-	-	-	-	478	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1452	-	-	-	463	927
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1452	-	-	-	408	927
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	550	-

Approach	EB	WB	SB
HCM Control Delay, s	4.4	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1452	-	-	-	852
HCM Lane V/C Ratio	0.118	-	-	-	0.247
HCM Control Delay (s)	7.8	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	158	184	21	23	31
Future Vol, veh/h	19	158	184	21	23	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	165	192	22	24	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	214	0	-	0	407	203
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	204	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1356	-	-	-	600	838
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	830	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1356	-	-	-	590	838
Mov Cap-2 Maneuver	-	-	-	-	590	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	817	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1356	-	-	-	711
HCM Lane V/C Ratio	0.015	-	-	-	0.079
HCM Control Delay (s)	7.7	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

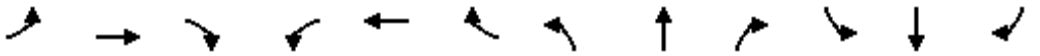
Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	108	128	33	43	58
Future Vol, veh/h	56	108	128	33	43	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	115	136	35	46	62

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	136	0	-	0	370	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	234	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1448	-	-	-	630	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	805	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1448	-	-	-	604	913
Mov Cap-2 Maneuver	-	-	-	-	604	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	772	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	10.6
HCM LOS			B

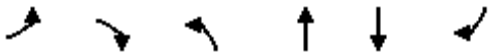
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1448	-	-	-	750
HCM Lane V/C Ratio	0.041	-	-	-	0.143
HCM Control Delay (s)	7.6	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	6	58	2	7	9	62	279	6	8	250	100
Future Volume (vph)	94	6	58	2	7	9	62	279	6	8	250	100
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1565		1593	1672		1593	1856		1593	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1565		1593	1672		1593	1856		1593	1863	1548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	6	61	2	7	9	65	294	6	8	263	105
RTOR Reduction (vph)	0	52	0	0	9	0	0	1	0	0	0	74
Lane Group Flow (vph)	99	15	0	2	7	0	65	299	0	8	263	31
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			4			1			2			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	5.8	6.1		0.6	0.9		3.6	14.9		0.6	11.9	11.9
Effective Green, g (s)	5.8	6.1		0.6	0.9		3.6	14.9		0.6	11.9	11.9
Actuated g/C Ratio	0.14	0.15		0.01	0.02		0.09	0.37		0.01	0.30	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	229	237		23	37		142	687		23	551	458
v/s Ratio Prot	c0.06	c0.01		0.00	0.00		c0.04	c0.16		0.01	0.14	
v/s Ratio Perm												0.02
v/c Ratio	0.43	0.06		0.09	0.19		0.46	0.44		0.35	0.48	0.07
Uniform Delay, d1	15.7	14.6		19.5	19.3		17.4	9.5		19.6	11.6	10.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.1		1.6	2.6		2.3	0.4		8.9	0.7	0.1
Delay (s)	17.0	14.7		21.2	21.9		19.7	9.9		28.5	12.3	10.2
Level of Service	B	B		C	C		B	A		C	B	B
Approach Delay (s)		16.1			21.8			11.7			12.0	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	5	4	224	245	2
Future Volume (vph)	5	5	4	224	245	2
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3535	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3535	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	5	5	4	241	263	2
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	5	0	4	241	265	0
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	0.7	0.7	0.7	29.0	24.8	
Effective Green, g (s)	0.7	0.7	0.7	29.0	24.8	
Actuated g/C Ratio	0.02	0.02	0.02	0.75	0.64	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	28	28	28	1403	2277	
v/s Ratio Prot	c0.00		0.00	c0.13	0.07	
v/s Ratio Perm		0.00				
v/c Ratio	0.18	0.00	0.14	0.17	0.12	
Uniform Delay, d1	18.6	18.6	18.6	1.3	2.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.0	0.9	0.1	0.0	
Delay (s)	19.7	18.6	19.5	1.5	2.7	
Level of Service	B	B	B	A	A	
Approach Delay (s)	19.2			1.8	2.7	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	2.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	38.5	Sum of lost time (s)	12.3
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	6	215	13	4	234
Future Vol, veh/h	11	6	215	13	4	234
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	7	234	14	4	254

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	504	241	0	0	248	0
Stage 1	241	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	528	798	-	-	1318	-
Stage 1	799	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	526	798	-	-	1318	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	778	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	658	1318	-
HCM Lane V/C Ratio	-	-	0.028	0.003	-
HCM Control Delay (s)	-	-	10.6	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	30	213	9	29	233
Future Vol, veh/h	9	30	213	9	29	233
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	32	224	9	31	245

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	536	230	0	0	235	0
Stage 1	230	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	505	809	-	-	1332	-
Stage 1	808	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	491	808	-	-	1332	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	727	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	737	1332	-
HCM Lane V/C Ratio	-	-	0.056	0.023	-
HCM Control Delay (s)	-	-	10.2	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

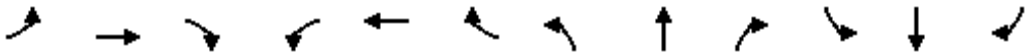
Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	1	3	32	2	24	3	220	21	24	221	4
Future Vol, veh/h	5	1	3	32	2	24	3	220	21	24	221	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1	3	34	2	26	3	234	22	26	235	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	553	552	237	543	543	246	239	0	0	257	0	0
Stage 1	288	288	-	253	253	-	-	-	-	-	-	-
Stage 2	265	264	-	290	290	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	444	442	802	451	447	793	1328	-	-	1308	-	-
Stage 1	720	674	-	751	698	-	-	-	-	-	-	-
Stage 2	740	690	-	718	672	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	420	430	802	439	435	792	1328	-	-	1308	-	-
Mov Cap-2 Maneuver	420	430	-	439	435	-	-	-	-	-	-	-
Stage 1	718	658	-	748	695	-	-	-	-	-	-	-
Stage 2	712	687	-	698	657	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	12.6	0.1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1328	-	-	501	538	1308	-	-
HCM Lane V/C Ratio	0.002	-	-	0.019	0.115	0.02	-	-
HCM Control Delay (s)	7.7	0	-	12.3	12.6	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	167	96	137	186	92	75	186	101	99	154	29
Future Volume (vph)	16	167	96	137	186	92	75	186	101	99	154	29
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1561	1593	3539	1558	1593	3337		1593	3447	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1561	1593	3539	1558	1593	3337		1593	3447	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	178	102	146	198	98	80	198	107	105	164	31
RTOR Reduction (vph)	0	0	78	0	0	63	0	68	0	0	14	0
Lane Group Flow (vph)	17	178	24	146	198	35	80	237	0	105	181	0
Confl. Peds. (#/hr)						6			2			5
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	0.9	14.6	14.6	8.5	22.2	22.2	6.4	14.3		7.2	15.1	
Effective Green, g (s)	0.9	14.6	14.6	8.5	22.2	22.2	6.4	14.3		7.2	15.1	
Actuated g/C Ratio	0.01	0.24	0.24	0.14	0.36	0.36	0.10	0.23		0.12	0.25	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	23	838	369	219	1275	561	165	774		186	844	
v/s Ratio Prot	0.01	c0.05		c0.09	0.06		0.05	c0.07		c0.07	0.05	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.74	0.21	0.07	0.67	0.16	0.06	0.48	0.31		0.56	0.21	
Uniform Delay, d1	30.2	18.9	18.2	25.2	13.3	12.9	26.0	19.5		25.7	18.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	69.6	0.3	0.2	5.8	0.1	0.1	0.8	0.5		2.3	0.3	
Delay (s)	99.8	19.1	18.4	31.0	13.5	13.0	26.9	20.0		28.0	18.8	
Level of Service	F	B	B	C	B	B	C	C		C	B	
Approach Delay (s)		23.5			19.2			21.4			22.0	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1	8	273	266	11
Future Vol, veh/h	5	1	8	273	266	11
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	145	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1	8	284	277	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	444	146	291	0	-	0
Stage 1	285	-	-	-	-	-
Stage 2	159	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	542	875	1268	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	537	873	1268	-	-	-
Mov Cap-2 Maneuver	537	-	-	-	-	-
Stage 1	737	-	-	-	-	-
Stage 2	846	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1268	-	574	-	-
HCM Lane V/C Ratio	0.007	-	0.011	-	-
HCM Control Delay (s)	7.9	-	11.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

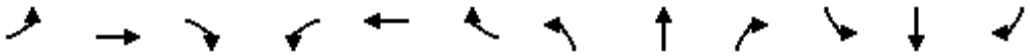
Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	31	274	7	36	270
Future Vol, veh/h	8	31	274	7	36	270
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	33	295	8	39	290

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	521	151	0	0	302	0
Stage 1	298	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	485	868	-	-	1256	-
Stage 1	727	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	467	868	-	-	1256	-
Mov Cap-2 Maneuver	553	-	-	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	764	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1
HCM LOS	A		

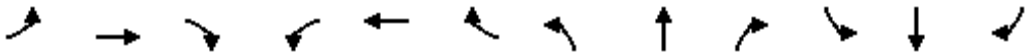
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	777	1256	-
HCM Lane V/C Ratio	-	-	0.054	0.031	-
HCM Control Delay (s)	-	-	9.9	8	0.1
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	0	16	3	4	7	24	282	3	6	316	45
Future Volume (vph)	29	0	16	3	4	7	24	282	3	6	316	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.93		1.00	1.00		1.00	0.98	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1710			1712		1593	3533		1593	3465	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1710			1712		1593	3533		1593	3465	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	31	0	17	3	4	8	26	303	3	6	340	48
RTOR Reduction (vph)	0	44	0	0	8	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	4	0	0	7	0	26	306	0	6	380	0
Confl. Peds. (#/hr)			2						1			
Confl. Bikes (#/hr)									2			1
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		3.8			0.6		0.8	26.8		0.6	26.6	
Effective Green, g (s)		3.8			0.6		0.8	26.8		0.6	26.6	
Actuated g/C Ratio		0.08			0.01		0.02	0.55		0.01	0.55	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		134			21		26	1960		19	1908	
v/s Ratio Prot		c0.00			c0.00		c0.02	0.09		0.00	c0.11	
v/s Ratio Perm												
v/c Ratio		0.03			0.34		1.00	0.16		0.32	0.20	
Uniform Delay, d1		20.5			23.7		23.8	5.2		23.6	5.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			3.5		176.5	0.1		3.5	0.1	
Delay (s)		20.6			27.1		200.3	5.3		27.1	5.6	
Level of Service		C			C		F	A		C	A	
Approach Delay (s)		20.6			27.1			20.6			5.9	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

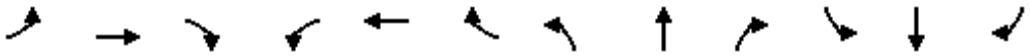
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	11	1	0	0	10	385	2	13	452	16
Future Volume (vph)	15	0	11	1	0	0	10	385	2	13	452	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1695			1770		1593	3536		1593	3519	
Flt Permitted		0.83			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1442			1863		1593	3536		1593	3519	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	16	0	12	1	0	0	11	414	2	14	486	17
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	2	0	0	1	0	11	416	0	14	501	0
Confl. Peds. (#/hr)			5			8			7			
Confl. Bikes (#/hr)									1			3
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		3.8			0.5		0.7	29.6		0.7	29.6	
Effective Green, g (s)		3.8			0.5		0.7	29.6		0.7	29.6	
Actuated g/C Ratio		0.07			0.01		0.01	0.58		0.01	0.58	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		107			18		21	2048		21	2038	
v/s Ratio Prot							0.01	0.12		c0.01	c0.14	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.02			0.06		0.52	0.20		0.67	0.25	
Uniform Delay, d1		21.9			25.1		25.0	5.1		25.1	5.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.5		10.4	0.2		47.8	0.2	
Delay (s)		21.9			25.5		35.5	5.3		72.9	5.5	
Level of Service		C			C		D	A		E	A	
Approach Delay (s)		21.9			25.5			6.1			7.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	211	50	127	246	302	66	287	110	267	329	127
Future Volume (vph)	89	211	50	127	246	302	66	287	110	267	329	127
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1546	1593	3539	1552	1593	3375		1593	3375	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1546	1593	3539	1552	1593	3375		1593	3375	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	222	53	134	259	318	69	302	116	281	346	134
RTOR Reduction (vph)	0	0	43	0	0	235	0	29	0	0	25	0
Lane Group Flow (vph)	94	222	10	134	259	83	69	389	0	281	455	0
Confl. Peds. (#/hr)			4			10			5			4
Confl. Bikes (#/hr)			7						2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.1	16.6	16.6	12.5	23.0	23.0	7.2	19.7		23.0	35.2	
Effective Green, g (s)	6.1	16.6	16.6	12.5	23.0	23.0	7.2	19.7		23.0	35.2	
Actuated g/C Ratio	0.07	0.19	0.19	0.14	0.26	0.26	0.08	0.22		0.26	0.40	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	214	667	291	226	924	405	130	755		416	1350	
v/s Ratio Prot	0.03	c0.06		c0.08	0.07		0.04	c0.12		c0.18	0.13	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.44	0.33	0.03	0.59	0.28	0.21	0.53	0.52		0.68	0.34	
Uniform Delay, d1	39.3	30.9	29.2	35.4	25.9	25.4	38.8	30.0		29.2	18.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6	0.1	2.8	0.3	0.5	2.1	1.2		3.4	0.3	
Delay (s)	39.8	31.5	29.3	38.1	26.3	25.9	40.9	31.1		32.5	18.6	
Level of Service	D	C	C	D	C	C	D	C		C	B	
Approach Delay (s)		33.3			28.3			32.5			23.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	7	73	52	291	81	281	1	45	677	359	236	269
Future Volume (vph)	7	73	52	291	81	281	1	45	677	359	236	269
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1490	3312	1461	2891	1515	1408		1490	3312	1482	2891	3312
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1490	3312	1461	2891	1515	1408		1490	3312	1482	2891	3312
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	8	83	59	331	92	319	1	51	769	408	268	306
RTOR Reduction (vph)	0	0	49	0	37	155	0	0	0	175	0	0
Lane Group Flow (vph)	8	83	10	331	176	43	0	52	769	233	268	306
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot	NA
Protected Phases	8	8		7	7		1	1	6	7	5	2
Permitted Phases			8			7				6		
Actuated Green, G (s)	18.2	18.2	18.2	23.7	23.7	23.7		9.1	31.8	55.5	15.9	38.6
Effective Green, g (s)	18.2	18.2	18.2	23.7	23.7	23.7		9.1	31.8	55.5	15.9	38.6
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22	0.22		0.08	0.29	0.51	0.14	0.35
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	3.0	5.0
Lane Grp Cap (vph)	247	549	242	624	327	304		123	960	749	419	1165
v/s Ratio Prot	0.01	c0.03		0.11	c0.12			0.03	c0.23	0.07	c0.09	0.09
v/s Ratio Perm			0.01			0.03				0.09		
v/c Ratio	0.03	0.15	0.04	0.53	0.54	0.14		0.42	0.80	0.31	0.64	0.26
Uniform Delay, d1	38.4	39.1	38.4	38.1	38.2	34.8		47.8	36.0	15.9	44.2	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.1	0.9	1.7	0.2		2.3	5.5	0.2	3.2	0.3
Delay (s)	38.4	39.3	38.5	38.9	39.9	35.0		50.1	41.6	16.1	47.4	25.6
Level of Service	D	D	D	D	D	C		D	D	B	D	C
Approach Delay (s)		38.9			38.1				33.5			35.7
Approach LOS		D			D				C			D

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	20.1
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	3
Future Volume (vph)	3
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1448
Flt Permitted	1.00
Satd. Flow (perm)	1448
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	3
RTOR Reduction (vph)	2
Lane Group Flow (vph)	1
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	9%
Turn Type	Perm
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	38.6
Effective Green, g (s)	38.6
Actuated g/C Ratio	0.35
Clearance Time (s)	6.5
Vehicle Extension (s)	5.0
Lane Grp Cap (vph)	509
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	23.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	23.1
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	24	70	575	33	222	518	93	93	120	519	69	49
Future Volume (vph)	24	70	575	33	222	518	93	93	120	519	69	49
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900
Total Lost time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1533	3406	1524	1533	3406	1485	1533	1792	1524	1533	1673
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1533	3406	1524	1533	3406	1485	1533	1792	1524	1533	1673
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	78	639	37	247	576	103	103	133	577	77	54
RTOR Reduction (vph)	0	0	0	26	0	0	60	0	0	487	0	19
Lane Group Flow (vph)	0	105	639	11	247	576	43	103	133	90	77	72
Confl. Peds. (#/hr)							3					
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			6			3		
Actuated Green, G (s)		11.3	29.1	29.1	20.9	38.7	38.7	13.8	13.8	13.8	12.4	12.4
Effective Green, g (s)		11.3	29.1	29.1	20.9	38.7	38.7	13.8	13.8	13.8	12.4	12.4
Actuated g/C Ratio		0.12	0.31	0.31	0.22	0.41	0.41	0.15	0.15	0.15	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0	2.0	8.0	8.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		184	1057	473	341	1406	613	225	263	224	202	221
v/s Ratio Prot		0.07	c0.19		c0.16	0.17		0.07	c0.07		c0.05	0.04
v/s Ratio Perm				0.01			0.03			0.06		
v/c Ratio		0.57	0.60	0.02	0.72	0.41	0.07	0.46	0.51	0.40	0.38	0.33
Uniform Delay, d1		38.9	27.4	22.4	33.7	19.4	16.6	36.5	36.8	36.2	37.1	36.9
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.6	2.4	0.1	6.3	0.8	0.2	0.5	0.6	0.4	0.4	0.3
Delay (s)		41.6	29.8	22.5	40.1	20.3	16.8	37.1	37.4	36.6	37.6	37.2
Level of Service		D	C	C	D	C	B	D	D	D	D	D
Approach Delay (s)			31.0			25.2			36.8			37.4
Approach LOS			C			C			D			D

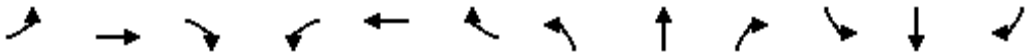
Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	17.5
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	37
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	1085	18	33	773	315	1	3	9	247	10	35
Future Volume (vph)	31	1085	18	33	773	315	1	3	9	247	10	35
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.91			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00			0.96	
Satd. Flow (prot)	1533	3397		1533	3406	1486		1621			1689	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00			0.96	
Satd. Flow (perm)	1533	3397		1533	3406	1486		1621			1689	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	38	1340	22	41	954	389	1	4	11	305	12	43
RTOR Reduction (vph)	0	1	0	0	0	225	0	11	0	0	4	0
Lane Group Flow (vph)	38	1361	0	41	954	164	0	5	0	0	356	0
Confl. Peds. (#/hr)						3						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						
Actuated Green, G (s)	4.3	35.4		4.4	35.1	35.1		1.1			24.4	
Effective Green, g (s)	4.3	35.4		4.4	35.1	35.1		1.1			24.4	
Actuated g/C Ratio	0.05	0.43		0.05	0.42	0.42		0.01			0.29	
Clearance Time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Vehicle Extension (s)	2.0	7.9		2.0	7.3	7.3		2.0			2.0	
Lane Grp Cap (vph)	79	1447		81	1438	627		21			495	
v/s Ratio Prot	0.02	c0.40		c0.03	0.28			c0.00			c0.21	
v/s Ratio Perm						0.11						
v/c Ratio	0.48	0.94		0.51	0.66	0.26		0.25			0.72	
Uniform Delay, d1	38.3	22.8		38.3	19.3	15.6		40.6			26.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	1.7	13.2		1.8	2.2	0.8		2.2			4.3	
Delay (s)	40.0	36.1		40.1	21.5	16.4		42.8			30.6	
Level of Service	D	D		D	C	B		D			C	
Approach Delay (s)		36.2			20.6			42.8			30.6	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	1306	4	1	3	1096	28	3	0	4	24	0
Future Volume (vph)	10	1306	4	1	3	1096	28	3	0	4	24	0
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Frt	1.00	1.00			1.00	1.00			0.93			0.95
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.97
Satd. Flow (prot)	1518	3372			1518	3359			1607			1638
Flt Permitted	0.95	1.00			0.95	1.00			0.95			1.00
Satd. Flow (perm)	1518	3372			1518	3359			1568			1690
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	12	1573	5	1	4	1320	34	4	0	5	29	0
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	9	0	0	44
Lane Group Flow (vph)	12	1578	0	0	5	1353	0	0	0	0	0	1
Confl. Peds. (#/hr)			1				1					
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	1.4	82.0			1.2	81.8			3.1			3.1
Effective Green, g (s)	1.4	82.0			1.2	81.8			3.1			3.1
Actuated g/C Ratio	0.01	0.82			0.01	0.82			0.03			0.03
Clearance Time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Vehicle Extension (s)	2.0	7.3			2.0	7.3			2.0			2.0
Lane Grp Cap (vph)	21	2765			18	2747			48			52
v/s Ratio Prot	c0.01	c0.47			0.00	0.40						
v/s Ratio Perm									0.00			c0.00
v/c Ratio	0.57	0.57			0.28	0.49			0.01			0.03
Uniform Delay, d1	49.0	3.0			49.0	2.8			47.0			47.0
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	21.2	0.9			3.0	0.6			0.0			0.1
Delay (s)	70.2	3.9			52.0	3.4			47.0			47.1
Level of Service	E	A			D	A			D			D
Approach Delay (s)		4.4				3.6			47.0			47.1
Approach LOS		A				A			D			D

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	13
Future Volume (vph)	13
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	16
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	7%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	310	993	10	6	19	941	410	19	14	18	307	5
Future Volume (vph)	310	993	10	6	19	941	410	19	14	18	307	5
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (prot)	1533	3401			1533	3406	1524		1742	1524	1456	1624
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (perm)	1533	3401			1533	3406	1524		1742	1524	1456	1624
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	352	1128	11	7	22	1069	466	22	16	20	349	6
RTOR Reduction (vph)	0	0	0	0	0	0	300	0	0	19	0	0
Lane Group Flow (vph)	352	1139	0	0	29	1069	166	0	38	1	178	177
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	23.1	52.8			3.4	32.1	32.1		3.5	3.5	13.6	13.6
Effective Green, g (s)	23.1	52.8			3.4	32.1	32.1		3.5	3.5	13.6	13.6
Actuated g/C Ratio	0.26	0.59			0.04	0.36	0.36		0.04	0.04	0.15	0.15
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	393	1995			57	1214	543		67	59	220	245
v/s Ratio Prot	c0.23	0.33			0.02	c0.31			c0.02		c0.12	0.11
v/s Ratio Perm							0.11			0.00		
v/c Ratio	0.90	0.57			0.51	0.88	0.31		0.57	0.01	0.81	0.72
Uniform Delay, d1	32.3	11.6			42.5	27.2	20.9		42.5	41.6	36.9	36.4
Progression Factor	1.00	1.00			1.17	0.68	0.83		1.00	1.00	1.00	1.00
Incremental Delay, d2	21.6	1.2			1.9	7.2	1.1		6.4	0.0	18.3	8.6
Delay (s)	53.9	12.7			51.5	25.6	18.4		48.9	41.6	55.2	45.0
Level of Service	D	B			D	C	B		D	D	E	D
Approach Delay (s)		22.5				23.9			46.4			44.3
Approach LOS		C				C			D			D

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	161
Future Volume (vph)	161
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	183
RTOR Reduction (vph)	155
Lane Group Flow (vph)	28
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	13.6
Effective Green, g (s)	13.6
Actuated g/C Ratio	0.15
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	230
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.12
Uniform Delay, d1	33.0
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	33.1
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

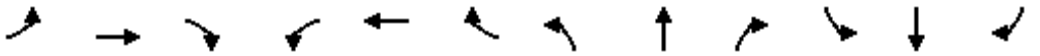
Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1325	0	23	1314	186	0	0	26	0	0	74
Future Vol, veh/h	0	1325	0	23	1314	186	0	0	26	0	0	74
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	71	71	71	71	92	71	92	71	92	92	92
Heavy Vehicles, %	2	6	6	6	6	2	6	2	6	2	2	2
Mvmt Flow	0	1866	0	32	1851	202	0	0	37	0	0	80

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1867	0	0	-	-	934	-	-	1026
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.22	-	-	-	-	7.02	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.26	-	-	-	-	3.36	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	303	-	-	0	0	260	0	0	199
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	303	-	-	-	-	260	-	-	199
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	21.1	34.8
HCM LOS			C	D

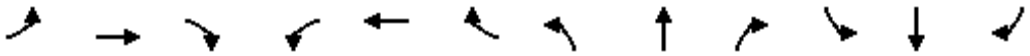
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	260	-	-	303	-	-	199
HCM Lane V/C Ratio	0.141	-	-	0.107	-	-	0.404
HCM Control Delay (s)	21.1	-	-	18.3	-	-	34.8
HCM Lane LOS	C	-	-	C	-	-	D
HCM 95th %tile Q(veh)	0.5	-	-	0.4	-	-	1.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1024	328	147	901	0	0	0	0	83	1	621
Future Volume (vph)	0	1024	328	147	901	0	0	0	0	83	1	621
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		4988	1517	1562	3471						1741	1553
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4988	1517	1562	3471						1741	1553
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	1205	386	173	1060	0	0	0	0	98	1	731
RTOR Reduction (vph)	0	0	226	0	0	0	0	0	0	0	0	115
Lane Group Flow (vph)	0	1205	160	173	1060	0	0	0	0	0	99	616
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		37.2	37.2	14.3	55.7						24.6	24.6
Effective Green, g (s)		37.2	37.2	14.3	55.7						24.6	24.6
Actuated g/C Ratio		0.41	0.41	0.16	0.62						0.27	0.27
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2061	627	248	2148						475	424
v/s Ratio Prot		c0.24		c0.11	0.31						0.06	
v/s Ratio Perm			0.11									c0.40
v/c Ratio		0.58	0.25	0.70	0.49						0.21	1.45
Uniform Delay, d1		20.4	17.3	35.8	9.4						25.2	32.7
Progression Factor		0.79	0.78	0.97	0.92						1.00	1.00
Incremental Delay, d2		1.1	0.9	3.9	0.5						0.2	216.8
Delay (s)		17.2	14.3	38.7	9.2						25.4	249.5
Level of Service		B	B	D	A						C	F
Approach Delay (s)		16.5			13.3			0.0			222.7	
Approach LOS		B			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	62.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	568	550	0	0	545	309	494	0	198	0	0	0
Future Volume (vph)	568	550	0	0	545	309	494	0	198	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1577	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1577	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	645	625	0	0	619	351	561	0	225	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	243	0	0	157	0	0	0
Lane Group Flow (vph)	645	625	0	0	619	108	0	561	68	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	26.8	53.1			22.1	22.1		27.2	27.2			
Effective Green, g (s)	26.8	53.1			22.1	22.1		27.2	27.2			
Actuated g/C Ratio	0.30	0.59			0.25	0.25		0.30	0.30			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	469	2067			860	385		529	473			
v/s Ratio Prot	c0.41	0.18			c0.18			c0.32				
v/s Ratio Perm						0.07			0.04			
v/c Ratio	1.38	0.30			0.72	0.28		1.06	0.14			
Uniform Delay, d1	31.6	9.2			31.1	27.5		31.4	22.9			
Progression Factor	0.49	0.25			0.97	1.68		1.00	1.00			
Incremental Delay, d2	180.3	0.3			4.8	1.7		56.1	0.2			
Delay (s)	195.9	2.6			35.1	47.8		87.5	23.1			
Level of Service	F	A			D	D		F	C			
Approach Delay (s)		100.8			39.7			69.1			0.0	
Approach LOS		F			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

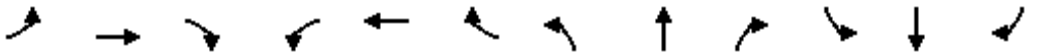
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	12	330	406	5	0	587	126	5	3	1	72	0
Future Volume (vph)	12	330	406	5	0	587	126	5	3	1	72	0
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8		5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00		0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98		1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85		0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00		1.00			0.97	1.00		0.95
Satd. Flow (prot)		3090	3539	1549		3437			1806	1558		1770
Flt Permitted		0.95	1.00	1.00		1.00			0.97	1.00		0.95
Satd. Flow (perm)		3090	3539	1549		3437			1806	1558		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	347	427	5	0	618	133	5	3	1	76	0
RTOR Reduction (vph)	0	0	0	1	0	11	0	0	0	1	0	0
Lane Group Flow (vph)	0	360	427	4	0	740	0	0	8	0	0	76
Confl. Peds. (#/hr)				1			2			4		
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		13.2	63.4	63.4		45.8			5.8	5.8		7.1
Effective Green, g (s)		13.2	63.4	63.4		45.8			5.8	5.8		7.1
Actuated g/C Ratio		0.15	0.70	0.70		0.51			0.06	0.06		0.08
Clearance Time (s)		4.5	5.8	5.8		5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5		1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		453	2493	1091		1749			116	100		139
v/s Ratio Prot		c0.12	0.12			c0.22			c0.00			c0.04
v/s Ratio Perm				0.00						0.00		
v/c Ratio		0.79	0.17	0.00		0.42			0.07	0.00		0.55
Uniform Delay, d1		37.1	4.5	3.9		13.8			39.6	39.4		39.9
Progression Factor		0.71	1.05	1.00		1.00			1.00	1.00		1.00
Incremental Delay, d2		8.5	0.1	0.0		0.8			0.1	0.0		2.3
Delay (s)		34.6	4.8	3.9		14.6			39.7	39.4		42.2
Level of Service		C	A	A		B			D	D		D
Approach Delay (s)			18.4			14.6			39.6			39.7
Approach LOS			B			B			D			D

Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	255
Future Volume (vph)	255
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	268
RTOR Reduction (vph)	247
Lane Group Flow (vph)	21
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	7.1
Effective Green, g (s)	7.1
Actuated g/C Ratio	0.08
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	124
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.17
Uniform Delay, d1	38.7
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	38.9
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	437	1	2	601	11	0	0	0	12	0	103
Future Volume (Veh/h)	38	437	1	2	601	11	0	0	0	12	0	103
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	43	491	1	2	675	12	0	0	0	13	0	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	687			492			1035	1268	492	1262	1263	344
vC1, stage 1 conf vol							578	578		685	685	
vC2, stage 2 conf vol							458	691		578	578	
vCu, unblocked vol	687			416			1000	1251	415	1245	1245	344
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	100	100	96	100	82
cM capacity (veh/h)	890			1046			324	326	540	312	344	647

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	535	340	350	0	13	116
Volume Left	43	2	0	0	13	0
Volume Right	1	0	12	0	0	116
cSH	890	1046	1700	1700	312	647
Volume to Capacity	0.05	0.00	0.21	0.00	0.04	0.18
Queue Length 95th (ft)	4	0	0	0	3	16
Control Delay (s)	1.3	0.1	0.0	0.0	17.1	11.8
Lane LOS	A	A		A	C	B
Approach Delay (s)	1.3	0.0		0.0	12.3	
Approach LOS				A	B	

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	55.5%	ICU Level of Service		B
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	401	49	20	611	14	5
Future Vol, veh/h	401	49	20	611	14	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	441	54	22	671	15	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	495	0	1183	468
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	715	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1053	-	206	589
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	479	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1053	-	199	589
Mov Cap-2 Maneuver	-	-	-	-	199	-
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	241	-	-	1053	-
HCM Lane V/C Ratio	0.087	-	-	0.021	-
HCM Control Delay (s)	21.4	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	398	6	1	611	3	10	0	1	5	0	13
Future Vol, veh/h	3	398	6	1	611	3	10	0	1	5	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	447	7	1	687	3	11	0	1	6	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	690	0	0	454	0	0	1155	1149	451	1148	1151	688
Stage 1	-	-	-	-	-	-	457	457	-	690	690	-
Stage 2	-	-	-	-	-	-	698	692	-	458	461	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	905	-	-	1107	-	-	174	198	608	176	198	446
Stage 1	-	-	-	-	-	-	583	568	-	435	446	-
Stage 2	-	-	-	-	-	-	431	445	-	583	565	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	905	-	-	1107	-	-	168	197	608	175	197	446
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	197	-	175	197	-
Stage 1	-	-	-	-	-	-	581	566	-	433	446	-
Stage 2	-	-	-	-	-	-	416	445	-	580	563	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	26.5	17.3
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	180	905	-	-	1107	-	-	312
HCM Lane V/C Ratio	0.069	0.004	-	-	0.001	-	-	0.065
HCM Control Delay (s)	26.5	9	0	-	8.3	0	-	17.3
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	108	297	417	46	33	176
Future Vol, veh/h	108	297	417	46	33	176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	120	330	463	51	37	196

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	514	0	-	0	1059	489
Stage 1	-	-	-	-	489	-
Stage 2	-	-	-	-	570	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1052	-	-	-	249	579
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	566	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1052	-	-	-	221	579
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	501	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	20.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1052	-	-	-	461
HCM Lane V/C Ratio	0.114	-	-	-	0.504
HCM Control Delay (s)	8.9	-	-	-	20.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	2.8

Intersection	
Int Delay, s/veh	9.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	272	57	139	40	39	327
Future Vol, veh/h	272	57	139	40	39	327
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	63	153	44	43	359

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	197	0	-	0	835	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	660	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1376	-	-	-	338	868
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1376	-	-	-	265	868
Mov Cap-2 Maneuver	-	-	-	-	265	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	402	-

Approach	EB	WB	SB
HCM Control Delay, s	6.9	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1376	-	-	-	699
HCM Lane V/C Ratio	0.217	-	-	-	0.575
HCM Control Delay (s)	8.3	-	-	-	16.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.8	-	-	-	3.7

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	39	224	303	23	30	64
Future Vol, veh/h	39	224	303	23	30	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	267	361	27	36	76

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	388	0	-	0	734	374
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	360	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1170	-	-	-	387	672
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	706	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1170	-	-	-	369	672
Mov Cap-2 Maneuver	-	-	-	-	369	-
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1170	-	-	-	532
HCM Lane V/C Ratio	0.04	-	-	-	0.21
HCM Control Delay (s)	8.2	0	-	-	13.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

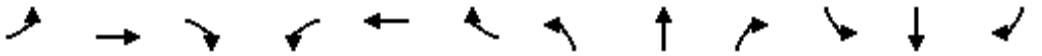
Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	44	225	188	25	61	96
Future Vol, veh/h	44	225	188	25	61	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	65	331	276	37	90	141

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	276	0	-	0	736	276
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	460	-
Critical Hdwy	4.14	-	-	-	7.14	6.24
Critical Hdwy Stg 1	-	-	-	-	6.14	-
Critical Hdwy Stg 2	-	-	-	-	6.14	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1275	-	-	-	332	758
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1275	-	-	-	319	758
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	548	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1275	-	-	-	494
HCM Lane V/C Ratio	0.051	-	-	-	0.467
HCM Control Delay (s)	8	-	-	-	18.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	14	112	6	7	7	49	335	12	9	384	117
Future Volume (vph)	198	14	112	6	7	7	49	335	12	9	384	117
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1547	1569		1547	1674		1547	1800		1547	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1547	1569		1547	1674		1547	1800		1547	1810	1538
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	236	17	133	7	8	8	58	399	14	11	457	139
RTOR Reduction (vph)	0	109	0	0	8	0	0	1	0	0	0	84
Lane Group Flow (vph)	236	41	0	7	8	0	58	412	0	11	457	55
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.1	9.4		0.7	1.0		3.8	24.0		0.7	20.9	20.9
Effective Green, g (s)	9.1	9.4		0.7	1.0		3.8	24.0		0.7	20.9	20.9
Actuated g/C Ratio	0.17	0.18		0.01	0.02		0.07	0.45		0.01	0.40	0.40
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	266	279		20	31		111	818		20	716	608
v/s Ratio Prot	c0.15	c0.03		0.00	0.00		c0.04	c0.23		0.01	c0.25	
v/s Ratio Perm												0.04
v/c Ratio	0.89	0.15		0.35	0.26		0.52	0.50		0.55	0.64	0.09
Uniform Delay, d1	21.3	18.3		25.8	25.5		23.6	10.2		25.9	12.9	10.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	27.8	0.2		10.3	4.5		4.4	0.5		28.9	1.9	0.1
Delay (s)	49.1	18.6		36.1	30.0		28.0	10.7		54.8	14.8	10.1
Level of Service	D	B		D	C		C	B		D	B	B
Approach Delay (s)		37.3			31.9			12.8			14.4	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	0	2	153	0	7	53	209	380	24	50	255
Future Volume (vph)	5	0	2	153	0	7	53	209	380	24	50	255
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.98
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3479
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3479
Peak-hour factor, PHF	0.79	0.92	0.79	0.92	0.92	0.92	0.92	0.79	0.79	0.92	0.92	0.79
Adj. Flow (vph)	6	0	3	166	0	8	58	265	481	26	54	323
RTOR Reduction (vph)	0	0	3	0	0	7	0	0	0	13	0	9
Lane Group Flow (vph)	0	6	0	83	83	1	0	323	481	13	54	355
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		0.7	0.7	7.3	7.3	7.3		18.1	31.0	31.0	4.5	17.4
Effective Green, g (s)		0.7	0.7	7.3	7.3	7.3		18.1	31.0	31.0	4.5	17.4
Actuated g/C Ratio		0.01	0.01	0.12	0.12	0.12		0.29	0.50	0.50	0.07	0.28
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		19	17	177	196	185		462	927	787	115	971
v/s Ratio Prot		c0.00		c0.05	0.05			c0.20	c0.26		0.03	0.10
v/s Ratio Perm			0.00			0.00				0.01		
v/c Ratio		0.32	0.00	0.47	0.42	0.01		0.70	0.52	0.02	0.47	0.37
Uniform Delay, d1		30.6	30.5	25.7	25.5	24.3		19.7	10.6	7.9	27.8	18.0
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.5	0.0	2.0	1.5	0.0		3.7	0.9	0.0	3.0	0.5
Delay (s)		34.0	30.5	27.6	27.0	24.3		23.4	11.5	7.9	30.8	18.5
Level of Service		C	C	C	C	C		C	B	A	C	B
Approach Delay (s)		32.8			27.2				16.0			20.1
Approach LOS		C			C				B			C

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	18.8
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	32
Future Volume (vph)	32
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	41
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	15	366	15	6	295
Future Vol, veh/h	12	15	366	15	6	295
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	15	18	446	18	7	360

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	830	456	0	0	466	0
Stage 1	456	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	339	602	-	-	1090	-
Stage 1	636	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	336	601	-	-	1090	-
Mov Cap-2 Maneuver	454	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	687	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	525	1090	-
HCM Lane V/C Ratio	-	-	0.063	0.007	-
HCM Control Delay (s)	-	-	12.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	2

Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	2	41	49	386	15	22	258
Future Vol, veh/h	2	41	49	386	15	22	258
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	0	-	-	0
Grade, %	-	0	-	0	-	-	0
Peak Hour Factor	92	79	79	79	79	79	79
Heavy Vehicles, %	2	3	3	3	3	3	3
Mvmt Flow	2	52	62	489	19	28	327

Major/Minor	Minor1			Major1		Major2	
Conflicting Flow All	0	880	498	0	0	508	0
Stage 1	0	498	-	-	-	-	-
Stage 2	0	382	-	-	-	-	-
Critical Hdwy	-	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	-	5.43	-	-	-	-	-
Critical Hdwy Stg 2	-	5.43	-	-	-	-	-
Follow-up Hdwy	-	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	0	316	570	-	-	1052	-
Stage 1	0	609	-	-	-	-	-
Stage 2	0	688	-	-	-	-	-
Platoon blocked, %	-			-	-		-
Mov Cap-1 Maneuver	0	306	570	-	-	1052	-
Mov Cap-2 Maneuver	0	429	-	-	-	-	-
Stage 1	0	609	-	-	-	-	-
Stage 2	0	665	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	496	1052	-
HCM Lane V/C Ratio	-	-	0.23	0.026	-
HCM Control Delay (s)	-	-	14.4	8.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

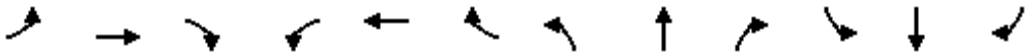
Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	1	1	58	3	114	1	346	69	76	239	4
Future Vol, veh/h	6	1	1	58	3	114	1	346	69	76	239	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1	1	78	4	154	1	468	93	103	323	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1127	1095	326	1049	1051	514	328	0	0	561	0	0
Stage 1	531	531	-	517	517	-	-	-	-	-	-	-
Stage 2	596	564	-	532	534	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	182	214	715	205	227	560	1232	-	-	1010	-	-
Stage 1	532	526	-	541	534	-	-	-	-	-	-	-
Stage 2	490	508	-	531	524	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	117	187	715	184	198	560	1232	-	-	1010	-	-
Mov Cap-2 Maneuver	117	187	-	184	198	-	-	-	-	-	-	-
Stage 1	531	460	-	540	533	-	-	-	-	-	-	-
Stage 2	352	507	-	462	459	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.3	39.8	0	2.1
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1232	-	-	138	328	1010	-	-
HCM Lane V/C Ratio	0.001	-	-	0.078	0.721	0.102	-	-
HCM Control Delay (s)	7.9	0	-	33.3	39.8	9	0	-
HCM Lane LOS	A	A	-	D	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	5.3	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	189	92	181	352	148	238	262	166	113	205	65
Future Volume (vph)	9	189	92	181	352	148	238	262	166	113	205	65
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1541	1593	3539	1549	1593	3311		1593	3395	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1541	1593	3539	1549	1593	3311		1593	3395	
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	12	252	123	241	469	197	317	349	221	151	273	87
RTOR Reduction (vph)	0	0	98	0	0	122	0	91	0	0	31	0
Lane Group Flow (vph)	12	252	25	241	469	75	317	479	0	151	329	0
Confl. Peds. (#/hr)			1			9			4			6
Confl. Bikes (#/hr)			3			3			2			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.1	18.3	18.3	16.7	33.9	33.9	20.7	24.8		12.8	16.9	
Effective Green, g (s)	1.1	18.3	18.3	16.7	33.9	33.9	20.7	24.8		12.8	16.9	
Actuated g/C Ratio	0.01	0.20	0.20	0.19	0.38	0.38	0.23	0.28		0.14	0.19	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	19	722	314	296	1338	586	368	916		227	640	
v/s Ratio Prot	0.01	0.07		c0.15	c0.13		c0.20	c0.14		0.09	0.10	
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.63	0.35	0.08	0.81	0.35	0.13	0.86	0.52		0.67	0.51	
Uniform Delay, d1	44.0	30.5	28.8	35.0	20.0	18.2	33.1	27.4		36.4	32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.9	0.6	0.2	14.9	0.3	0.2	17.7	1.0		5.6	1.4	
Delay (s)	85.0	31.2	29.1	49.8	20.3	18.4	50.8	28.4		42.0	34.1	
Level of Service	F	C	C	D	C	B	D	C		D	C	
Approach Delay (s)		32.2			27.7			36.4			36.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	89.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	5	1	2	10	458	327	13
Future Vol, veh/h	5	1	2	10	458	327	13
Conflicting Peds, #/hr	0	0	0	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	145	-	-	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	5	1	2	11	503	359	14

Major/Minor	Minor2	Major1				Major2	
Conflicting Flow All	645	188	373	375	0	-	0
Stage 1	367	-	-	-	-	-	-
Stage 2	278	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	2.22	-	-	-
Pot Cap-1 Maneuver	405	822	833	1180	-	-	-
Stage 1	671	-	-	-	-	-	-
Stage 2	744	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	404	821	1103	1103	-	-	-
Mov Cap-2 Maneuver	404	-	-	-	-	-	-
Stage 1	670	-	-	-	-	-	-
Stage 2	743	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1103	-	441	-	-
HCM Lane V/C Ratio	0.012	-	0.015	-	-
HCM Control Delay (s)	8.3	-	13.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

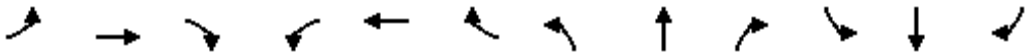
Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	57	458	5	29	324
Future Vol, veh/h	19	57	458	5	29	324
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	22	65	520	6	33	368

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	773	263	0	0	526	0
Stage 1	523	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Critical Hdwy	6.88	6.98	-	-	4.18	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.34	-	-	2.24	-
Pot Cap-1 Maneuver	331	729	-	-	1023	-
Stage 1	554	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	317	729	-	-	1023	-
Mov Cap-2 Maneuver	427	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	732	-	-	-	-	-

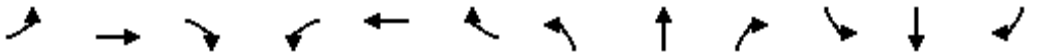
Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	619	1023	-
HCM Lane V/C Ratio	-	-	0.14	0.032	-
HCM Control Delay (s)	-	-	11.8	8.6	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	4	65	9	18	16	103	473	7	9	257	146
Future Volume (vph)	120	4	65	9	18	16	103	473	7	9	257	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.95		1.00	1.00		1.00	0.95	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1712			1750		1593	3530		1593	3312	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1712			1750		1593	3530		1593	3312	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	136	5	74	10	20	18	117	538	8	10	292	166
RTOR Reduction (vph)	0	20	0	0	17	0	0	1	0	0	81	0
Lane Group Flow (vph)	0	195	0	0	31	0	117	545	0	10	377	0
Confl. Peds. (#/hr)			7						1			8
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.8			3.4		7.8	28.0		0.8	21.0	
Effective Green, g (s)		12.8			3.4		7.8	28.0		0.8	21.0	
Actuated g/C Ratio		0.21			0.06		0.13	0.46		0.01	0.34	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		356			96		202	1607		20	1130	
v/s Ratio Prot		c0.11			c0.02		c0.07	c0.15		0.01	0.11	
v/s Ratio Perm												
v/c Ratio		0.55			0.32		0.58	0.34		0.50	0.33	
Uniform Delay, d1		21.8			27.9		25.3	10.8		30.2	15.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.7		2.5	0.3		7.0	0.4	
Delay (s)		22.7			28.7		27.8	11.0		37.1	15.4	
Level of Service		C			C		C	B		D	B	
Approach Delay (s)		22.7			28.7			14.0			15.9	
Approach LOS		C			C			B			B	

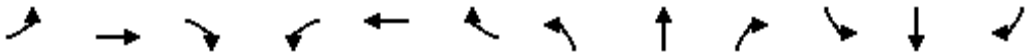
Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	61.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	55	47	34	0	5	25	642	50	182	432	47
Future Volume (vph)	63	55	47	34	0	5	25	642	50	182	432	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.93		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758			1635		1593	3492		1593	3473	
Flt Permitted		0.86			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1538			1706		1593	3492		1593	3473	
Peak-hour factor, PHF	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Adj. Flow (vph)	86	75	64	47	0	7	34	879	68	249	592	64
RTOR Reduction (vph)	0	10	0	0	52	0	0	5	0	0	6	0
Lane Group Flow (vph)	0	215	0	0	2	0	34	942	0	249	650	0
Confl. Peds. (#/hr)						149			6			10
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		27.8			3.4		4.5	37.8		21.0	54.3	
Effective Green, g (s)		27.8			3.4		4.5	37.8		21.0	54.3	
Actuated g/C Ratio		0.26			0.03		0.04	0.35		0.20	0.51	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		401			54		67	1239		314	1770	
v/s Ratio Prot							0.02	c0.27		c0.16	0.19	
v/s Ratio Perm		c0.14			c0.00							
v/c Ratio		0.54			0.03		0.51	0.76		0.79	0.37	
Uniform Delay, d1		33.8			50.0		49.9	30.4		40.7	15.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.1		2.2	3.8		12.1	0.4	
Delay (s)		34.5			50.0		52.1	34.1		52.7	16.1	
Level of Service		C			D		D	C		D	B	
Approach Delay (s)		34.5			50.0			34.8			26.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	106.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	256	120	232	404	207	217	579	172	109	386	100
Future Volume (vph)	125	256	120	232	404	207	217	579	172	109	386	100
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1527	1593	3539	1531	1593	3391		1593	3414	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1527	1593	3539	1531	1593	3391		1593	3414	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	139	284	133	258	449	230	241	643	191	121	429	111
RTOR Reduction (vph)	0	0	96	0	0	145	0	18	0	0	17	0
Lane Group Flow (vph)	139	284	37	258	449	85	241	816	0	121	523	0
Confl. Peds. (#/hr)			24			21			19			8
Confl. Bikes (#/hr)			1			2			2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	9.6	23.6	23.6	21.7	35.7	35.7	17.2	31.8		12.9	27.2	
Effective Green, g (s)	9.6	23.6	23.6	21.7	35.7	35.7	17.2	31.8		12.9	27.2	
Actuated g/C Ratio	0.09	0.22	0.22	0.20	0.34	0.34	0.16	0.30		0.12	0.26	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	279	786	339	325	1189	514	258	1015		193	874	
v/s Ratio Prot	0.04	0.08		c0.16	c0.13		c0.15	c0.24		0.08	0.15	
v/s Ratio Perm			0.02			0.06						
v/c Ratio	0.50	0.36	0.11	0.79	0.38	0.17	0.93	0.80		0.63	0.60	
Uniform Delay, d1	46.0	34.9	32.9	40.1	26.8	24.8	43.9	34.3		44.4	34.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6	0.3	11.7	0.4	0.3	37.9	5.4		4.5	1.7	
Delay (s)	46.5	35.5	33.2	51.9	27.2	25.1	81.9	39.7		48.9	36.4	
Level of Service	D	D	C	D	C	C	F	D		D	D	
Approach Delay (s)		37.7			33.5			49.1			38.7	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	106.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	3	393	13	3	305
Future Vol, veh/h	30	3	393	13	3	305
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	3	427	14	3	332

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	772	434	0	0	441	0
Stage 1	434	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	368	622	-	-	1119	-
Stage 1	653	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	367	622	-	-	1119	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	720	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	381	1119	-
HCM Lane V/C Ratio	-	-	0.094	0.003	-
HCM Control Delay (s)	-	-	15.4	8.2	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

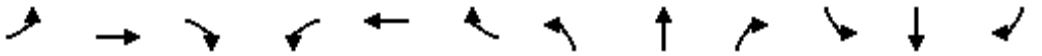
Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	104	545	157	0	500
Future Vol, veh/h	0	104	545	157	0	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	113	592	171	0	543

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	382	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	616	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	616	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	616	-
HCM Lane V/C Ratio	-	-	0.184	-
HCM Control Delay (s)	-	-	12.2	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.7	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	78	58	500	68	214	31	412	362	321	693	9
Future Volume (vph)	6	78	58	500	68	214	31	412	362	321	693	9
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1562	3471	1533	3030	1587	1456	1562	3471	1544	3030	3471	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1562	3471	1533	3030	1587	1456	1562	3471	1544	3030	3471	1520
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	6	81	60	521	71	223	32	429	377	334	722	9
RTOR Reduction (vph)	0	0	52	0	0	0	0	0	161	0	0	6
Lane Group Flow (vph)	6	81	8	521	151	143	32	429	216	334	722	3
Confl. Peds. (#/hr)			1									1
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	14.1	14.1	14.1	27.6	27.6	27.6	5.7	24.0	51.6	18.0	36.3	36.3
Effective Green, g (s)	14.1	14.1	14.1	27.6	27.6	27.6	5.7	24.0	51.6	18.0	36.3	36.3
Actuated g/C Ratio	0.14	0.14	0.14	0.27	0.27	0.27	0.05	0.23	0.50	0.17	0.35	0.35
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	212	471	208	805	421	387	85	802	767	525	1213	531
v/s Ratio Prot	0.00	c0.02		c0.17	0.10		0.02	0.12	0.07	c0.11	c0.21	
v/s Ratio Perm			0.01			0.10			0.06			0.00
v/c Ratio	0.03	0.17	0.04	0.65	0.36	0.37	0.38	0.53	0.28	0.64	0.60	0.01
Uniform Delay, d1	38.9	39.7	39.0	33.8	30.9	31.0	47.3	35.0	15.3	39.9	27.7	22.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	1.8	0.5	0.6	2.8	1.3	0.2	2.5	1.2	0.0
Delay (s)	39.0	39.9	39.0	35.6	31.4	31.6	50.1	36.3	15.5	42.4	28.9	22.0
Level of Service	D	D	D	D	C	C	D	D	B	D	C	C
Approach Delay (s)		39.5			34.1			27.4			33.1	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	20.1
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	11	40	583	79	3	478	638	39	62	45	383	81
Future Volume (vph)	11	40	583	79	3	478	638	39	62	45	383	81
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1900	1900	1710
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	12	44	641	87	3	525	701	43	68	49	421	89
RTOR Reduction (vph)	0	0	0	62	0	0	0	19	0	0	380	0
Lane Group Flow (vph)	0	56	641	25	0	528	701	24	68	49	41	89
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2				6			3	
Actuated Green, G (s)		7.0	29.6	29.6		37.0	59.6	59.6	10.1	10.1	10.1	10.6
Effective Green, g (s)		7.0	29.6	29.6		37.0	59.6	59.6	10.1	10.1	10.1	10.6
Actuated g/C Ratio		0.07	0.28	0.28		0.35	0.57	0.57	0.10	0.10	0.10	0.10
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		104	980	438		551	1973	864	150	176	149	157
v/s Ratio Prot		0.04	c0.18			c0.34	0.20		c0.04	0.03		c0.06
v/s Ratio Perm				0.02				0.02			0.03	
v/c Ratio		0.54	0.65	0.06		0.96	0.36	0.03	0.45	0.28	0.27	0.57
Uniform Delay, d1		47.3	33.1	27.4		33.1	12.2	9.9	44.7	44.0	43.9	44.9
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	3.3	0.2		27.6	0.5	0.1	0.8	0.3	0.4	2.8
Delay (s)		50.0	36.4	27.6		60.8	12.7	10.0	45.5	44.3	44.3	47.7
Level of Service		D	D	C		E	B	A	D	D	D	D
Approach Delay (s)			36.4				32.6			44.5		
Approach LOS			D				C			D		

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	104.8	Sum of lost time (s)	17.5
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	59	34
Future Volume (vph)	59	34
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	1.00	
Satd. Flow (prot)	1728	
Flt Permitted	1.00	
Satd. Flow (perm)	1728	
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	65	37
RTOR Reduction (vph)	16	0
Lane Group Flow (vph)	86	0
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	10.6	
Effective Green, g (s)	10.6	
Actuated g/C Ratio	0.10	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	174	
v/s Ratio Prot	0.05	
v/s Ratio Perm		
v/c Ratio	0.49	
Uniform Delay, d1	44.6	
Progression Factor	1.00	
Incremental Delay, d2	0.8	
Delay (s)	45.4	
Level of Service	D	
Approach Delay (s)	46.4	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	4	37	947	1	2	2	1059	206	5	13	7	325
Future Volume (vph)	4	37	947	1	2	2	1059	206	5	13	7	325
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		0.96		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (prot)		1577	3504			1577	3505	1533		1748		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (perm)		1577	3504			1577	3505	1533		1748		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	41	1052	1	2	2	1177	229	6	14	8	361
RTOR Reduction (vph)	0	0	0	0	0	0	0	139	0	7	0	0
Lane Group Flow (vph)	0	45	1053	0	0	4	1177	90	0	21	0	0
Confl. Peds. (#/hr)								1			1	
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.6	41.6			0.8	37.4	37.4		7.8		
Effective Green, g (s)		4.6	41.6			0.8	37.4	37.4		7.8		
Actuated g/C Ratio		0.05	0.44			0.01	0.39	0.39		0.08		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		76	1537			13	1382	604		143		
v/s Ratio Prot		c0.03	0.30			0.00	c0.34			c0.01		
v/s Ratio Perm								0.06				
v/c Ratio		0.59	0.69			0.31	0.85	0.15		0.14		
Uniform Delay, d1		44.2	21.3			46.7	26.2	18.5		40.4		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		8.0	2.5			4.8	6.4	0.4		0.2		
Delay (s)		52.2	23.8			51.6	32.5	18.9		40.6		
Level of Service		D	C			D	C	B		D		
Approach Delay (s)			25.0				30.4			40.6		
Approach LOS			C				C			D		

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	18.2
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1	31
Future Volume (vph)	1	31
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	0.96	
Satd. Flow (prot)	1743	
Flt Permitted	0.96	
Satd. Flow (perm)	1743	
Peak-hour factor, PHF	0.90	0.90
Adj. Flow (vph)	1	34
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	393	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	33%	3%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	26.8	
Effective Green, g (s)	26.8	
Actuated g/C Ratio	0.28	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	492	
v/s Ratio Prot	c0.23	
v/s Ratio Perm		
v/c Ratio	0.80	
Uniform Delay, d1	31.5	
Progression Factor	1.00	
Incremental Delay, d2	8.3	
Delay (s)	39.8	
Level of Service	D	
Approach Delay (s)	39.8	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	14	1278	3	2	14	1287	44	4	0	11	25
Future Volume (vph)	1	14	1278	3	2	14	1287	44	4	0	11	25
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	1.00			0.90		
Flt Protected		0.95	1.00			0.95	1.00			0.99		
Satd. Flow (prot)		1547	3437			1547	3418			1591		
Flt Permitted		0.95	1.00			0.95	1.00			0.90		
Satd. Flow (perm)		1547	3437			1547	3418			1448		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1	14	1318	3	2	14	1327	45	4	0	11	26
RTOR Reduction (vph)	0	0	0	0	0	0	2	0	0	14	0	0
Lane Group Flow (vph)	0	15	1321	0	0	16	1370	0	0	1	0	0
Confl. Peds. (#/hr)				1				4			4	
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		5.5	70.0			1.4	65.9			4.9		
Effective Green, g (s)		5.5	70.0			1.4	65.9			4.9		
Actuated g/C Ratio		0.06	0.78			0.02	0.73			0.05		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		94	2673			24	2502			78		
v/s Ratio Prot		0.01	c0.38			c0.01	c0.40					
v/s Ratio Perm										0.00		
v/c Ratio		0.16	0.49			0.67	0.55			0.01		
Uniform Delay, d1		40.1	3.6			44.1	5.4			40.3		
Progression Factor		1.00	1.00			1.21	1.71			1.00		
Incremental Delay, d2		0.3	0.7			28.3	0.5			0.0		
Delay (s)		40.3	4.3			81.9	9.7			40.3		
Level of Service		D	A			F	A			D		
Approach Delay (s)			4.7				10.6			40.3		
Approach LOS			A				B			D		

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	9
Future Volume (vph)	0	9
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.96	
Satd. Flow (prot)	1678	
Flt Permitted	0.77	
Satd. Flow (perm)	1344	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	0	9
RTOR Reduction (vph)	33	0
Lane Group Flow (vph)	2	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	5%	5%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	4.9	
Effective Green, g (s)	4.9	
Actuated g/C Ratio	0.05	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	73	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.03	
Uniform Delay, d1	40.3	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	40.3	
Level of Service	D	
Approach Delay (s)	40.3	
Approach LOS	D	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	225	1038	18	19	19	1015	337	28	15	19	747	12
Future Volume (vph)	225	1038	18	19	19	1015	337	28	15	19	747	12
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (prot)	1577	3494			1752	3505	1568		1786	1568	1498	1671
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (perm)	1577	3494			1752	3505	1568		1786	1568	1498	1671
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	232	1070	19	20	20	1046	347	29	15	20	770	12
RTOR Reduction (vph)	0	1	0	0	0	0	232	0	0	19	0	0
Lane Group Flow (vph)	232	1088	0	0	40	1046	115	0	44	1	393	389
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	17.0	44.2			3.6	29.8	29.8		3.7	3.7	21.8	21.8
Effective Green, g (s)	17.0	44.2			3.6	29.8	29.8		3.7	3.7	21.8	21.8
Actuated g/C Ratio	0.19	0.49			0.04	0.33	0.33		0.04	0.04	0.24	0.24
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	297	1715			70	1160	519		73	64	362	404
v/s Ratio Prot	c0.15	0.31			0.02	c0.30			c0.02		c0.26	0.23
v/s Ratio Perm							0.07			0.00		
v/c Ratio	0.78	0.63			0.57	0.90	0.22		0.60	0.01	1.09	0.96
Uniform Delay, d1	34.7	16.9			42.4	28.7	21.7		42.4	41.4	34.1	33.7
Progression Factor	1.10	0.76			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	10.7	1.6			6.8	11.3	1.0		9.2	0.0	72.2	34.8
Delay (s)	49.0	14.4			49.3	40.0	22.7		51.7	41.4	106.3	68.5
Level of Service	D	B			D	D	C		D	D	F	E
Approach Delay (s)		20.5				36.1			48.5			71.4
Approach LOS		C				D			D			E

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	286
Future Volume (vph)	286
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	295
RTOR Reduction (vph)	149
Lane Group Flow (vph)	146
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	21.8
Effective Green, g (s)	21.8
Actuated g/C Ratio	0.24
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	379
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.39
Uniform Delay, d1	28.5
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	28.7
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1861	0	5	1235	238	0	0	28	0	0	65
Future Vol, veh/h	0	1861	0	5	1235	238	0	0	28	0	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2023	0	5	1342	259	0	0	30	0	0	71

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	2023	0	0	-	-	1011	-	-	801
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	4.14	-	-	-	-	6.94	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.22	-	-	-	-	3.32	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	277	-	-	0	0	237	0	0	281
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	277	-	-	-	-	237	-	-	281
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	22.4	22.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	237	-	-	277	-	-	281
HCM Lane V/C Ratio	0.128	-	-	0.02	-	-	0.251
HCM Control Delay (s)	22.4	-	-	18.3	-	-	22.1
HCM Lane LOS	C	-	-	C	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-	-	1



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	1205	593	2	228	814	0	0	0	0	162	0
Future Volume (vph)	0	1205	593	2	228	814	0	0	0	0	162	0
Ideal Flow (vphpl)	1900	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1		4.2	5.1						4.6
Lane Util. Factor		0.91	1.00		1.00	0.95						1.00
Frpb, ped/bikes		1.00	0.98		1.00	1.00						1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00						1.00
Frt		1.00	0.85		1.00	1.00						1.00
Flt Protected		1.00	1.00		0.95	1.00						0.95
Satd. Flow (prot)		5036	1532		1577	3505						1752
Flt Permitted		1.00	1.00		0.95	1.00						0.95
Satd. Flow (perm)		5036	1532		1577	3505						1752
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1282	631	2	243	866	0	0	0	0	172	0
RTOR Reduction (vph)	0	0	366	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1282	265	0	245	866	0	0	0	0	0	172
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	Prot	NA					Split	NA
Protected Phases		2		1	1	6					4	4
Permitted Phases			2									
Actuated Green, G (s)		32.0	32.0		15.8	52.0						15.8
Effective Green, g (s)		32.0	32.0		15.8	52.0						15.8
Actuated g/C Ratio		0.41	0.41		0.20	0.67						0.20
Clearance Time (s)		5.1	5.1		4.2	5.1						4.6
Vehicle Extension (s)		4.0	4.0		2.0	4.0						2.5
Lane Grp Cap (vph)		2079	632		321	2351						357
v/s Ratio Prot		c0.25			c0.16	0.25						0.10
v/s Ratio Perm			0.17									
v/c Ratio		0.62	0.42		0.76	0.37						0.48
Uniform Delay, d1		17.9	16.2		29.1	5.6						27.2
Progression Factor		1.00	1.00		1.00	1.00						1.00
Incremental Delay, d2		0.6	0.6		9.3	0.1						0.7
Delay (s)		18.5	16.8		38.4	5.7						28.0
Level of Service		B	B		D	A						C
Approach Delay (s)		18.0				12.9			0.0			275.3
Approach LOS		B				B			A			F

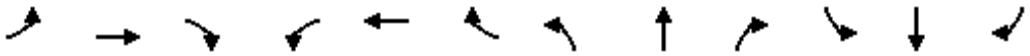
Intersection Summary			
HCM 2000 Control Delay	74.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	13.9
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	664
Future Volume (vph)	664
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.6
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	706
RTOR Reduction (vph)	181
Lane Group Flow (vph)	525
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	15.8
Effective Green, g (s)	15.8
Actuated g/C Ratio	0.20
Clearance Time (s)	4.6
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	319
v/s Ratio Prot	
v/s Ratio Perm	c0.34
v/c Ratio	1.65
Uniform Delay, d1	30.9
Progression Factor	1.00
Incremental Delay, d2	304.7
Delay (s)	335.6
Level of Service	F
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	656	698	0	0	650	180	386	0	199	0	0	0
Future Volume (vph)	656	698	0	0	650	180	386	0	199	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1577	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1577	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	691	735	0	0	684	189	406	0	209	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	117	0	0	154	0	0	0
Lane Group Flow (vph)	691	735	0	0	684	72	0	406	55	0	0	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	29.6	56.7			22.9	22.9		23.6	23.6			
Effective Green, g (s)	29.6	56.7			22.9	22.9		23.6	23.6			
Actuated g/C Ratio	0.33	0.63			0.25	0.25		0.26	0.26			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	518	2208			891	398		459	411			
v/s Ratio Prot	c0.44	0.21			c0.20			c0.23				
v/s Ratio Perm						0.05			0.03			
v/c Ratio	1.33	0.33			0.77	0.18		0.88	0.13			
Uniform Delay, d1	30.2	7.8			31.1	26.2		31.9	25.4			
Progression Factor	1.00	1.00			0.98	1.34		1.00	1.00			
Incremental Delay, d2	163.1	0.4			5.8	0.9		18.2	0.2			
Delay (s)	193.3	8.2			36.2	36.0		50.1	25.5			
Level of Service	F	A			D	D		D	C			
Approach Delay (s)		97.9			36.1			41.7			0.0	
Approach LOS		F			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	67.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	295	588	9	1	488	91	7	1	2	101	1
Future Volume (vph)	1	295	588	9	1	488	91	7	1	2	101	1
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95
Satd. Flow (prot)		3060	3505	1568	1577	3414			1767	1534		1758
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.95
Satd. Flow (perm)		3060	3505	1568	1577	3414			1767	1534		1758
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1	314	626	10	1	519	97	7	1	2	107	1
RTOR Reduction (vph)	0	0	0	4	0	9	0	0	0	2	0	0
Lane Group Flow (vph)	0	315	626	6	1	607	0	0	8	0	0	108
Confl. Peds. (#/hr)							3			9		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		12.0	57.7	57.7	0.8	45.6			5.8	5.8		8.5
Effective Green, g (s)		12.0	57.7	57.7	0.8	45.6			5.8	5.8		8.5
Actuated g/C Ratio		0.13	0.64	0.64	0.01	0.51			0.06	0.06		0.09
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		408	2247	1005	14	1729			113	98		166
v/s Ratio Prot		c0.10	0.18		0.00	c0.18			c0.00			c0.06
v/s Ratio Perm				0.00						0.00		
v/c Ratio		0.77	0.28	0.01	0.07	0.35			0.07	0.00		0.65
Uniform Delay, d1		37.7	7.1	5.8	44.2	13.3			39.6	39.4		39.3
Progression Factor		0.86	1.33	1.00	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		7.7	0.3	0.0	0.8	0.6			0.1	0.0		6.8
Delay (s)		40.0	9.7	5.8	45.0	13.9			39.7	39.4		46.1
Level of Service		D	A	A	D	B			D	D		D
Approach Delay (s)			19.7			13.9			39.6			39.9
Approach LOS			B			B			D			D

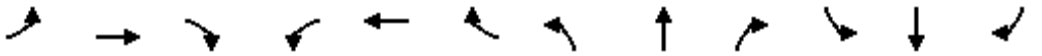
Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	328
Future Volume (vph)	328
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	349
RTOR Reduction (vph)	316
Lane Group Flow (vph)	33
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.5
Effective Green, g (s)	8.5
Actuated g/C Ratio	0.09
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	148
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.22
Uniform Delay, d1	37.7
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	38.0
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	563	2	2	488	21	7	0	2	14	0	72
Future Volume (Veh/h)	78	563	2	2	488	21	7	0	2	14	0	72
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	82	593	2	2	514	22	7	0	2	15	0	76
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	536			595			1095	1298	595	1290	1288	268
vC1, stage 1 conf vol							758	758		529	529	
vC2, stage 2 conf vol							337	540		761	759	
vCu, unblocked vol	536			475			1041	1271	475	1262	1260	268
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			98	100	100	95	100	90
cM capacity (veh/h)	1021			950			297	302	471	285	317	727

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	677	259	279	9	15	76
Volume Left	82	2	0	7	15	0
Volume Right	2	0	22	2	0	76
cSH	1021	950	1700	323	285	727
Volume to Capacity	0.08	0.00	0.16	0.03	0.05	0.10
Queue Length 95th (ft)	7	0	0	2	4	9
Control Delay (s)	2.0	0.1	0.0	16.4	18.3	10.5
Lane LOS	A	A		C	C	B
Approach Delay (s)	2.0	0.0		16.4	11.8	
Approach LOS				C	B	

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	64.9%	ICU Level of Service		C
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	557	20	2	456	53	7
Future Vol, veh/h	557	20	2	456	53	7
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	586	21	2	480	56	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	608	0	1082	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	484	-
Critical Hdwy	-	-	4.14	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.236	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	961	-	239	499
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	961	-	238	499
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	23.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	253	-	-	961	-
HCM Lane V/C Ratio	0.25	-	-	0.002	-
HCM Control Delay (s)	23.9	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	551	8	3	456	3	3	0	1	2	0	3
Future Vol, veh/h	10	551	8	3	456	3	3	0	1	2	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	580	8	3	480	3	3	0	1	2	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	483	0	0	588	0	0	1094	1094	584	1094	1097	482
Stage 1	-	-	-	-	-	-	605	605	-	488	488	-
Stage 2	-	-	-	-	-	-	489	489	-	606	609	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1080	-	-	987	-	-	191	214	512	191	213	584
Stage 1	-	-	-	-	-	-	485	487	-	561	550	-
Stage 2	-	-	-	-	-	-	561	549	-	484	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1080	-	-	987	-	-	187	210	512	188	209	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	210	-	188	209	-
Stage 1	-	-	-	-	-	-	478	480	-	553	548	-
Stage 2	-	-	-	-	-	-	556	547	-	476	478	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	21.5	16.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	222	1080	-	-	987	-	-	317
HCM Lane V/C Ratio	0.019	0.01	-	-	0.003	-	-	0.017
HCM Control Delay (s)	21.5	8.4	0	-	8.7	0	-	16.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	173	378	325	57	71	137
Future Vol, veh/h	173	378	325	57	71	137
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	420	361	63	79	152

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	424	0	-	0	1197	393
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	804	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1135	-	-	-	205	656
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	440	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1135	-	-	-	170	656
Mov Cap-2 Maneuver	-	-	-	-	170	-
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	366	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	37.3
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1135	-	-	-	332
HCM Lane V/C Ratio	0.169	-	-	-	0.696
HCM Control Delay (s)	8.8	-	-	-	37.3
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	0.6	-	-	-	4.9

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	329	142	111	41	34	252
Future Vol, veh/h	329	142	111	41	34	252
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	378	163	128	47	39	290

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	175	0	-	0	1071	151
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	920	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1401	-	-	-	244	895
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	388	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1401	-	-	-	178	895
Mov Cap-2 Maneuver	-	-	-	-	178	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	283	-

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	17.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1401	-	-	-	605
HCM Lane V/C Ratio	0.27	-	-	-	0.543
HCM Control Delay (s)	8.5	-	-	-	17.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	1.1	-	-	-	3.3

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	44	286	273	22	18	33
Future Vol, veh/h	44	286	273	22	18	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	295	281	23	19	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	304	0	-	0	679	293
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	386	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1257	-	-	-	417	746
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1257	-	-	-	399	746
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	657	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1257	-	-	-	571
HCM Lane V/C Ratio	0.036	-	-	-	0.092
HCM Control Delay (s)	8	0	-	-	11.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

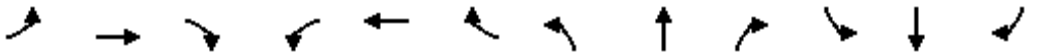
Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	98	171	219	49	41	82
Future Vol, veh/h	98	171	219	49	41	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	178	228	51	43	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	228	0	-	0	610	228
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1340	-	-	-	458	811
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	690	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1340	-	-	-	423	811
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	637	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1340	-	-	-	621
HCM Lane V/C Ratio	0.076	-	-	-	0.206
HCM Control Delay (s)	7.9	-	-	-	12.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	3	57	9	10	14	126	387	10	9	405	156
Future Volume (vph)	110	3	57	9	10	14	126	387	10	9	405	156
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1595		1593	1703		1593	1855		1593	1863	1550
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1595		1593	1703		1593	1855		1593	1863	1550
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	128	3	66	10	12	16	147	450	12	10	471	181
RTOR Reduction (vph)	0	54	0	0	15	0	0	1	0	0	0	108
Lane Group Flow (vph)	128	15	0	10	13	0	147	461	0	10	471	73
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	8.8	11.0		0.8	3.0		5.2	27.8		0.8	23.4	23.4
Effective Green, g (s)	8.8	11.0		0.8	3.0		5.2	27.8		0.8	23.4	23.4
Actuated g/C Ratio	0.15	0.19		0.01	0.05		0.09	0.48		0.01	0.40	0.40
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	240	300		21	87		141	883		21	746	621
v/s Ratio Prot	c0.08	0.01		0.01	c0.01		c0.09	c0.25		0.01	c0.25	
v/s Ratio Perm												0.05
v/c Ratio	0.53	0.05		0.48	0.15		1.04	0.52		0.48	0.63	0.12
Uniform Delay, d1	22.9	19.4		28.6	26.5		26.6	10.7		28.6	14.0	11.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	0.1		16.0	0.8		87.6	0.6		16.0	1.8	0.1
Delay (s)	25.2	19.5		44.6	27.3		114.2	11.2		44.6	15.8	11.1
Level of Service	C	B		D	C		F	B		D	B	B
Approach Delay (s)		23.2			31.8			36.1			14.9	
Approach LOS		C			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	42	0	55	429	0	20	58	11	273	160	71	477
Future Volume (vph)	42	0	55	429	0	20	58	11	273	160	71	477
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3527
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3527
Peak-hour factor, PHF	0.87	0.92	0.87	0.92	0.92	0.92	0.92	0.87	0.87	0.92	0.92	0.87
Adj. Flow (vph)	48	0	63	466	0	22	63	13	314	174	77	548
RTOR Reduction (vph)	0	0	58	0	0	16	0	0	0	123	0	1
Lane Group Flow (vph)	0	48	5	233	233	6	0	76	314	51	77	558
Confl. Peds. (#/hr)												
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		5.0	5.0	17.0	17.0	17.0		6.3	19.7	19.7	6.6	20.0
Effective Green, g (s)		5.0	5.0	17.0	17.0	17.0		6.3	19.7	19.7	6.6	20.0
Actuated g/C Ratio		0.07	0.07	0.25	0.25	0.25		0.09	0.29	0.29	0.10	0.30
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		131	117	383	425	401		149	546	464	156	1051
v/s Ratio Prot		c0.03		c0.15	0.14			0.05	c0.17		c0.05	0.16
v/s Ratio Perm			0.00			0.00				0.03		
v/c Ratio		0.37	0.04	0.61	0.55	0.01		0.51	0.58	0.11	0.49	0.53
Uniform Delay, d1		29.5	28.8	22.1	21.7	18.8		28.9	20.1	17.3	28.7	19.6
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.6	0.1	2.7	1.4	0.0		1.2	2.3	0.2	2.4	0.9
Delay (s)		30.2	28.9	24.8	23.2	18.8		30.2	22.4	17.5	31.1	20.6
Level of Service		C	C	C	C	B		C	C	B	C	C
Approach Delay (s)		29.4			23.8				21.9			21.8
Approach LOS		C			C				C			C

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	67.1	Sum of lost time (s)	18.8
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	5	321	12	3	491
Future Vol, veh/h	11	5	321	12	3	491
Conflicting Peds, #/hr	0	1	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	6	396	15	4	606

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1019	406	0	0	412	0
Stage 1	405	-	-	-	-	-
Stage 2	614	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	263	645	-	-	1147	-
Stage 1	673	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	261	644	-	-	1146	-
Mov Cap-2 Maneuver	389	-	-	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	444	1146	-
HCM Lane V/C Ratio	-	-	0.044	0.003	-
HCM Control Delay (s)	-	-	13.5	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	28	320	18	43	496
Future Vol, veh/h	16	28	320	18	43	496
Conflicting Peds, #/hr	0	2	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	33	376	21	51	584

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1074	391	0	0	400	0
Stage 1	389	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	243	658	-	-	1159	-
Stage 1	685	-	-	-	-	-
Stage 2	500	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	227	655	-	-	1157	-
Mov Cap-2 Maneuver	351	-	-	-	-	-
Stage 1	684	-	-	-	-	-
Stage 2	468	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	498	1157	-
HCM Lane V/C Ratio	-	-	0.104	0.044	-
HCM Control Delay (s)	-	-	13.1	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

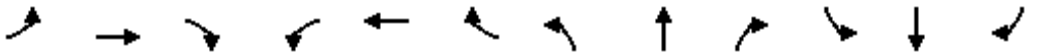
Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	2	1	64	1	33	2	316	42	72	526	14
Future Vol, veh/h	4	2	1	64	1	33	2	316	42	72	526	14
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	2	1	74	1	38	2	367	49	84	612	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1207	1212	624	1190	1196	396	630	0	0	418	0	0
Stage 1	789	789	-	399	399	-	-	-	-	-	-	-
Stage 2	418	423	-	791	797	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	160	182	485	165	186	653	952	-	-	1141	-	-
Stage 1	384	402	-	627	602	-	-	-	-	-	-	-
Stage 2	612	588	-	383	399	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	136	160	483	148	164	651	950	-	-	1139	-	-
Mov Cap-2 Maneuver	136	160	-	148	164	-	-	-	-	-	-	-
Stage 1	382	355	-	624	599	-	-	-	-	-	-	-
Stage 2	572	585	-	336	353	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.9	44.5	0	1
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	950	-	-	159	200	1139	-	-
HCM Lane V/C Ratio	0.002	-	-	0.051	0.57	0.074	-	-
HCM Control Delay (s)	8.8	0	-	28.9	44.5	8.4	0	-
HCM Lane LOS	A	A	-	D	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	3.1	0.2	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	358	269	236	289	104	134	253	161	160	268	42
Future Volume (vph)	40	358	269	236	289	104	134	253	161	160	268	42
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1557	1593	3539	1563	1593	3313		1593	3459	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1557	1593	3539	1563	1593	3313		1593	3459	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	398	299	262	321	116	149	281	179	178	298	47
RTOR Reduction (vph)	0	0	229	0	0	71	0	102	0	0	13	0
Lane Group Flow (vph)	44	398	70	262	321	45	149	358	0	178	332	0
Confl. Peds. (#/hr)			3						2			2
Confl. Bikes (#/hr)			2			2			1			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.5	20.0	20.0	17.5	33.0	33.0	12.7	17.3		13.8	18.4	
Effective Green, g (s)	4.5	20.0	20.0	17.5	33.0	33.0	12.7	17.3		13.8	18.4	
Actuated g/C Ratio	0.05	0.23	0.23	0.20	0.39	0.39	0.15	0.20		0.16	0.21	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	83	826	363	325	1364	602	236	669		256	743	
v/s Ratio Prot	0.03	c0.11		c0.16	0.09		0.09	c0.11		c0.11	0.10	
v/s Ratio Perm			0.04			0.03						
v/c Ratio	0.53	0.48	0.19	0.81	0.24	0.07	0.63	0.53		0.70	0.45	
Uniform Delay, d1	39.5	28.3	26.3	32.4	17.8	16.6	34.3	30.6		33.9	29.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.9	0.5	12.8	0.2	0.1	4.0	1.5		6.5	0.9	
Delay (s)	42.7	29.3	26.9	45.3	18.0	16.7	38.3	32.1		40.4	30.1	
Level of Service	D	C	C	D	B	B	D	C		D	C	
Approach Delay (s)		29.1			28.0			33.6			33.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	6	1	3	17	388	467	7
Future Vol, veh/h	6	1	3	17	388	467	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	145	-	-	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	7	1	3	18	422	508	8

Major/Minor	Minor2		Major1			Major2	
Conflicting Flow All	765	258	514	515	0	-	0
Stage 1	511	-	-	-	-	-	-
Stage 2	254	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	2.22	-	-	-
Pot Cap-1 Maneuver	340	741	678	1047	-	-	-
Stage 1	567	-	-	-	-	-	-
Stage 2	765	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	340	741	968	968	-	-	-
Mov Cap-2 Maneuver	340	-	-	-	-	-	-
Stage 1	567	-	-	-	-	-	-
Stage 2	765	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	968	-	368	-	-
HCM Lane V/C Ratio	0.022	-	0.021	-	-
HCM Control Delay (s)	8.8	-	15	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	18	392	5	50	462
Future Vol, veh/h	7	18	392	5	50	462
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	20	431	5	55	508

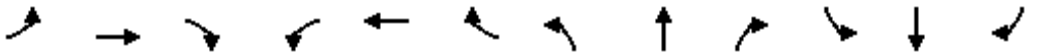
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	798	218	0	0	436	0
Stage 1	434	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	323	786	-	-	1120	-
Stage 1	621	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	301	786	-	-	1120	-
Mov Cap-2 Maneuver	422	-	-	-	-	-
Stage 1	621	-	-	-	-	-
Stage 2	627	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	633	1120	-
HCM Lane V/C Ratio	-	-	0.043	0.049	-
HCM Control Delay (s)	-	-	10.9	8.4	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	10	54	2	7	15	30	359	9	18	479	84
Future Volume (vph)	75	10	54	2	7	15	30	359	9	18	479	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.92		1.00	1.00		1.00	0.98	
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1693			1665		1577	3490		1577	3414	
Flt Permitted		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1693			1665		1577	3490		1577	3414	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	81	11	58	2	8	16	32	386	10	19	515	90
RTOR Reduction (vph)	0	25	0	0	15	0	0	2	0	0	12	0
Lane Group Flow (vph)	0	125	0	0	11	0	32	394	0	19	593	0
Confl. Peds. (#/hr)			1						1			4
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		8.8			1.7		2.0	25.2		0.8	24.0	
Effective Green, g (s)		8.8			1.7		2.0	25.2		0.8	24.0	
Actuated g/C Ratio		0.17			0.03		0.04	0.48		0.02	0.45	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		281			53		59	1659		23	1545	
v/s Ratio Prot		c0.07			c0.01		c0.02	0.11		0.01	c0.17	
v/s Ratio Perm												
v/c Ratio		0.44			0.20		0.54	0.24		0.83	0.38	
Uniform Delay, d1		19.9			25.0		25.1	8.2		26.0	9.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.7		5.4	0.2		106.5	0.3	
Delay (s)		20.3			25.7		30.4	8.4		132.5	9.9	
Level of Service		C			C		C	A		F	A	
Approach Delay (s)		20.3			25.7			10.0			13.7	
Approach LOS		C			C			B			B	

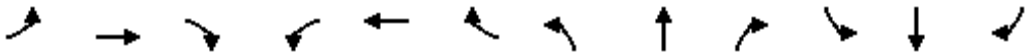
Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	0	19	12	0	1	19	575	3	23	680	32
Future Volume (vph)	27	0	19	12	0	1	19	575	3	23	680	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			4.0		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.99		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1763		1593	3536		1593	3511	
Flt Permitted		0.81			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1418			1845		1593	3536		1593	3511	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	29	0	20	13	0	1	20	612	3	24	723	34
RTOR Reduction (vph)	0	45	0	0	14	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	4	0	0	0	0	20	615	0	24	755	0
Confl. Peds. (#/hr)			4						4			6
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		5.0			0.5		0.8	35.5		0.9	35.6	
Effective Green, g (s)		5.0			0.5		0.8	35.5		0.9	35.6	
Actuated g/C Ratio		0.08			0.01		0.01	0.60		0.02	0.60	
Clearance Time (s)		4.5			4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		120			15		21	2131		24	2122	
v/s Ratio Prot							0.01	0.17		c0.02	c0.22	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.03			0.01		0.95	0.29		1.00	0.36	
Uniform Delay, d1		24.7			29.0		29.0	5.6		29.0	5.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.1		172.4	0.2		183.7	0.3	
Delay (s)		24.8			29.0		201.5	5.9		212.7	6.2	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		24.8			29.0			12.0			12.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	446	99	198	380	262	99	382	180	348	515	141
Future Volume (vph)	166	446	99	198	380	262	99	382	180	348	515	141
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1543	1593	3539	1545	1593	3337		1593	3403	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1543	1593	3539	1545	1593	3337		1593	3403	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	175	469	104	208	400	276	104	402	189	366	542	148
RTOR Reduction (vph)	0	0	76	0	0	196	0	39	0	0	16	0
Lane Group Flow (vph)	175	469	28	208	400	80	104	552	0	366	674	0
Confl. Peds. (#/hr)			11			10			14			15
Confl. Bikes (#/hr)			2			3			2			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	11.2	24.4	24.4	19.8	33.0	33.0	11.7	26.2		27.1	41.3	
Effective Green, g (s)	11.2	24.4	24.4	19.8	33.0	33.0	11.7	26.2		27.1	41.3	
Actuated g/C Ratio	0.10	0.21	0.21	0.17	0.29	0.29	0.10	0.23		0.24	0.36	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	304	759	331	277	1027	448	163	768		379	1236	
v/s Ratio Prot	0.06	c0.13		c0.13	0.11		0.07	c0.17		c0.23	0.20	
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.58	0.62	0.08	0.75	0.39	0.18	0.64	0.72		0.97	0.55	
Uniform Delay, d1	49.0	40.4	35.7	44.6	32.3	30.2	49.0	40.3		42.8	28.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	2.2	0.2	9.7	0.5	0.4	5.9	4.0		36.7	0.9	
Delay (s)	50.6	42.6	35.9	54.3	32.8	30.6	54.9	44.3		79.6	29.6	
Level of Service	D	D	D	D	C	C	D	D		E	C	
Approach Delay (s)		43.5			37.2			45.9			46.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	113.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	6	330	15	6	490
Future Vol, veh/h	60	6	330	15	6	490
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	7	359	16	7	533

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	913	367	0	0	375	0
Stage 1	367	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	304	678	-	-	1183	-
Stage 1	701	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	302	678	-	-	1183	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	577	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.6	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	318	1183	-
HCM Lane V/C Ratio	-	-	0.226	0.006	-
HCM Control Delay (s)	-	-	19.6	8.1	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	84	415	144	0	1027
Future Vol, veh/h	0	84	415	144	0	1027
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	91	451	157	0	1116

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	304	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	692	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	692	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	692	-
HCM Lane V/C Ratio	-	-	0.132	-
HCM Control Delay (s)	-	-	11	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.5	-

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	1	1	39	62	317	55	164	1	39	361	333	1
Future Volume (vph)	1	1	39	62	317	55	164	1	39	361	333	1
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710
Total Lost time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.92	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1593	3539	1562	3090	1632	1504		1593	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1593	3539	1562	3090	1632	1504		1593	3539	1583	
Peak-hour factor, PHF	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.97	0.97	0.97	0.92
Adj. Flow (vph)	1	1	40	64	327	57	169	1	40	372	343	1
RTOR Reduction (vph)	0	0	0	54	0	29	81	0	0	0	182	0
Lane Group Flow (vph)	0	2	40	10	327	89	27	0	41	372	161	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)				1								
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot
Protected Phases	8	8	8		7	7		1	1	6	7	5
Permitted Phases				8			7				6	
Actuated Green, G (s)		14.2	14.2	14.2	22.3	22.3	22.3		6.3	20.2	42.5	
Effective Green, g (s)		14.2	14.2	14.2	22.3	22.3	22.3		6.3	20.2	42.5	
Actuated g/C Ratio		0.16	0.16	0.16	0.25	0.25	0.25		0.07	0.22	0.47	
Clearance Time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	
Lane Grp Cap (vph)		249	553	244	758	400	369		110	787	740	
v/s Ratio Prot		0.00	c0.01		c0.11	0.05			0.03	c0.11	0.05	
v/s Ratio Perm				0.01			0.02				0.05	
v/c Ratio		0.01	0.07	0.04	0.43	0.22	0.07		0.37	0.47	0.22	
Uniform Delay, d1		32.4	32.7	32.5	28.9	27.3	26.3		40.4	30.7	14.3	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.0	0.1	0.1	0.4	0.3	0.1		2.1	0.9	0.1	
Delay (s)		32.4	32.7	32.6	29.3	27.6	26.4		42.5	31.6	14.4	
Level of Service		C	C	C	C	C	C		D	C	B	
Approach Delay (s)			32.6			28.4				24.4		
Approach LOS			C			C				C		

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.8	Sum of lost time (s)	20.1
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	192	386	9
Future Volume (vph)	192	386	9
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.1	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3090	3539	1538
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3090	3539	1538
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	198	398	9
RTOR Reduction (vph)	0	0	6
Lane Group Flow (vph)	199	398	3
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	14.0	27.9	27.9
Effective Green, g (s)	14.0	27.9	27.9
Actuated g/C Ratio	0.15	0.31	0.31
Clearance Time (s)	4.1	6.5	6.5
Vehicle Extension (s)	3.0	5.0	5.0
Lane Grp Cap (vph)	476	1087	472
v/s Ratio Prot	c0.06	0.11	
v/s Ratio Perm			0.00
v/c Ratio	0.42	0.37	0.01
Uniform Delay, d1	34.7	24.5	21.8
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.4	0.0
Delay (s)	35.3	25.0	21.8
Level of Service	D	C	C
Approach Delay (s)		28.3	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	17	26	470	51	3	234	489	42	1	68	27	286
Future Volume (vph)	17	26	470	51	3	234	489	42	1	68	27	286
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1710	1900	1900
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00		1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	3505	1568		1577	3505	1568		1577	1845	1568
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1583	3505	1568		1577	3505	1568		1577	1845	1568
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Adj. Flow (vph)	18	29	516	56	3	257	537	46	1	75	30	314
RTOR Reduction (vph)	0	0	0	37	0	0	0	22	0	0	0	277
Lane Group Flow (vph)	0	47	516	19	0	260	537	24	0	76	30	37
Heavy Vehicles (%)	2%	3%	3%	3%	2%	3%	3%	3%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	Split	NA	Perm
Protected Phases	5	5	2		1	1	6		3	3	3	
Permitted Phases				2				6				3
Actuated Green, G (s)		4.5	26.1	26.1		18.1	39.7	39.7		9.1	9.1	9.1
Effective Green, g (s)		4.5	26.1	26.1		18.1	39.7	39.7		9.1	9.1	9.1
Actuated g/C Ratio		0.06	0.34	0.34		0.24	0.52	0.52		0.12	0.12	0.12
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0		2.0	2.0	2.0
Lane Grp Cap (vph)		92	1191	532		371	1811	810		186	218	185
v/s Ratio Prot		0.03	c0.15			c0.16	0.15			c0.05	0.02	
v/s Ratio Perm				0.01				0.02				0.02
v/c Ratio		0.51	0.43	0.04		0.70	0.30	0.03		0.41	0.14	0.20
Uniform Delay, d1		35.1	19.6	16.9		26.9	10.6	9.1		31.4	30.3	30.6
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		2.0	1.1	0.1		4.8	0.4	0.1		0.5	0.1	0.2
Delay (s)		37.1	20.7	17.1		31.7	11.0	9.2		31.9	30.4	30.8
Level of Service		D	C	B		C	B	A		C	C	C
Approach Delay (s)			21.6				17.3				30.9	
Approach LOS			C				B				C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	76.8	Sum of lost time (s)	17.5
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	46	30	17
Future Volume (vph)	46	30	17
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.5	4.5	
Lane Util. Factor	1.00	1.00	
Frt	1.00	0.95	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1577	1744	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1577	1744	
Peak-hour factor, PHF	0.91	0.91	0.91
Adj. Flow (vph)	51	33	19
RTOR Reduction (vph)	0	17	0
Lane Group Flow (vph)	51	35	0
Heavy Vehicles (%)	3%	3%	3%
Turn Type	Split	NA	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)	6.0	6.0	
Effective Green, g (s)	6.0	6.0	
Actuated g/C Ratio	0.08	0.08	
Clearance Time (s)	4.5	4.5	
Vehicle Extension (s)	2.0	2.0	
Lane Grp Cap (vph)	123	136	
v/s Ratio Prot	c0.03	0.02	
v/s Ratio Perm			
v/c Ratio	0.41	0.26	
Uniform Delay, d1	33.7	33.3	
Progression Factor	1.00	1.00	
Incremental Delay, d2	0.8	0.4	
Delay (s)	34.6	33.7	
Level of Service	C	C	
Approach Delay (s)		34.1	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	2	50	752	0	2	2	717	151	1	2	0	146
Future Volume (vph)	2	50	752	0	2	2	717	151	1	2	0	146
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		1.00		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (prot)		1593	3539			1593	3539	1550		1832		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (perm)		1593	3539			1593	3539	1550		1832		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2	52	783	0	2	2	747	157	1	2	0	152
RTOR Reduction (vph)	0	0	0	0	0	0	0	88	0	0	0	0
Lane Group Flow (vph)	0	54	783	0	0	4	747	69	0	3	0	0
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.2	31.6			0.7	27.7	27.7		0.7		
Effective Green, g (s)		4.2	31.6			0.7	27.7	27.7		0.7		
Actuated g/C Ratio		0.07	0.50			0.01	0.44	0.44		0.01		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		106	1780			17	1560	683		20		
v/s Ratio Prot		c0.03	c0.22			0.00	0.21			c0.00		
v/s Ratio Perm								0.04				
v/c Ratio		0.51	0.44			0.24	0.48	0.10		0.15		
Uniform Delay, d1		28.3	10.0			30.8	12.4	10.3		30.8		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		1.4	0.7			2.6	0.9	0.2		1.3		
Delay (s)		29.7	10.7			33.4	13.3	10.5		32.0		
Level of Service		C	B			C	B	B		C		
Approach Delay (s)			11.9				12.9			32.0		
Approach LOS			B				B			C		

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	62.8	Sum of lost time (s)	18.2
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

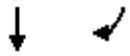


Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	2	46
Future Volume (vph)	2	46
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.96	
Satd. Flow (prot)	1738	
Flt Permitted	0.96	
Satd. Flow (perm)	1738	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	2	48
RTOR Reduction (vph)	10	0
Lane Group Flow (vph)	192	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	12.0	
Effective Green, g (s)	12.0	
Actuated g/C Ratio	0.19	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	332	
v/s Ratio Prot	c0.11	
v/s Ratio Perm		
v/c Ratio	0.58	
Uniform Delay, d1	23.1	
Progression Factor	1.00	
Incremental Delay, d2	1.5	
Delay (s)	24.6	
Level of Service	C	
Approach Delay (s)	24.6	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	10	881	8	4	11	822	29	3	0	10	28
Future Volume (vph)	1	10	881	8	4	11	822	29	3	0	10	28
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.90		
Flt Protected		0.95	1.00			0.95	1.00			0.99		
Satd. Flow (prot)		1593	3535			1593	3519			1650		
Flt Permitted		0.95	1.00			0.95	1.00			1.00		
Satd. Flow (perm)		1593	3535			1593	3519			1669		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	10	918	8	4	11	856	30	3	0	10	29
RTOR Reduction (vph)	0	0	0	0	0	0	1	0	0	12	0	0
Lane Group Flow (vph)	0	11	926	0	0	15	885	0	0	1	0	0
Confl. Bikes (#/hr)								2				
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		1.0	36.3			1.1	36.4			2.4		
Effective Green, g (s)		1.0	36.3			1.1	36.4			2.4		
Actuated g/C Ratio		0.02	0.68			0.02	0.68			0.04		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		29	2398			32	2394			74		
v/s Ratio Prot		0.01	c0.26			c0.01	0.25					
v/s Ratio Perm										0.00		
v/c Ratio		0.38	0.39			0.47	0.37			0.01		
Uniform Delay, d1		25.9	3.7			25.9	3.7			24.4		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		3.0	0.4			3.9	0.4			0.0		
Delay (s)		28.9	4.1			29.8	4.0			24.4		
Level of Service		C	A			C	A			C		
Approach Delay (s)			4.4				4.4			24.4		
Approach LOS			A				A			C		

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	13.7
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	21
Future Volume (vph)	0	21
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.94	
Flt Protected	0.97	
Satd. Flow (prot)	1706	
Flt Permitted	1.00	
Satd. Flow (perm)	1754	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	0	22
RTOR Reduction (vph)	49	0
Lane Group Flow (vph)	2	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	2.4	
Effective Green, g (s)	2.4	
Actuated g/C Ratio	0.04	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	78	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.03	
Uniform Delay, d1	24.4	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	24.5	
Level of Service	C	
Approach Delay (s)	24.5	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	231	664	6	23	7	695	349	7	11	8	1	649
Future Volume (vph)	231	664	6	23	7	695	349	7	11	8	1	649
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1710
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00		0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (prot)	1593	3534			1593	3539	1563		1827	1583		1513
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (perm)	1593	3534			1593	3539	1563		1827	1583		1513
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	241	692	6	24	7	724	364	7	11	8	1	676
RTOR Reduction (vph)	0	1	0	0	0	0	260	0	0	8	0	0
Lane Group Flow (vph)	241	697	0	0	31	724	104	0	18	0	0	339
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			1				1					
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	Split
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	17.3	40.7			3.4	25.8	25.8		1.9	1.9		27.3
Effective Green, g (s)	17.3	40.7			3.4	25.8	25.8		1.9	1.9		27.3
Actuated g/C Ratio	0.19	0.45			0.04	0.29	0.29		0.02	0.02		0.30
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2		0.2
Lane Grp Cap (vph)	306	1598			60	1014	448		38	33		458
v/s Ratio Prot	c0.15	0.20			0.02	c0.20			c0.01			c0.22
v/s Ratio Perm							0.07			0.00		
v/c Ratio	0.79	0.44			0.52	0.71	0.23		0.47	0.01		0.74
Uniform Delay, d1	34.6	16.8			42.5	28.8	24.5		43.6	43.1		28.2
Progression Factor	1.00	1.00			1.16	0.68	0.65		1.00	1.00		1.00
Incremental Delay, d2	11.7	0.9			2.8	3.9	1.1		3.4	0.0		5.6
Delay (s)	46.3	17.7			52.2	23.4	17.1		46.9	43.1		33.7
Level of Service	D	B			D	C	B		D	D		C
Approach Delay (s)		25.0				22.1			45.8			
Approach LOS		C				C			D			

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	7	185
Future Volume (vph)	7	185
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.4	4.4
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.95	1.00
Satd. Flow (prot)	1687	1560
Flt Permitted	0.95	1.00
Satd. Flow (perm)	1687	1560
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	7	193
RTOR Reduction (vph)	0	100
Lane Group Flow (vph)	345	93
Confl. Peds. (#/hr)		2
Confl. Bikes (#/hr)		1
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	27.3	27.3
Effective Green, g (s)	27.3	27.3
Actuated g/C Ratio	0.30	0.30
Clearance Time (s)	4.4	4.4
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	511	473
v/s Ratio Prot	0.20	
v/s Ratio Perm		0.06
v/c Ratio	0.68	0.20
Uniform Delay, d1	27.5	23.2
Progression Factor	1.00	1.00
Incremental Delay, d2	2.8	0.1
Delay (s)	30.2	23.3
Level of Service	C	C
Approach Delay (s)	30.1	
Approach LOS	C	

Intersection Summary

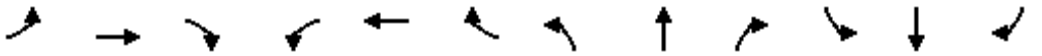
Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	1330	3	1	34	911	351	0	0	32	0	0	124
Future Vol, veh/h	0	1330	3	1	34	911	351	0	0	32	0	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	98	98	98	98	98	92	98	92	98	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1357	3	1	35	930	382	0	0	33	0	0	135

Major/Minor	Major1			Major2				Minor1			Minor2		
Conflicting Flow All	-	0	0	1360	1360	0	0	-	-	680	-	-	656
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	6.44	4.14	-	-	-	-	6.94	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.52	2.22	-	-	-	-	3.32	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	194	501	-	-	0	0	393	0	0	350
Stage 1	0	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-			-	-						
Mov Cap-1 Maneuver	-	-	-	476	476	-	-	-	-	393	-	-	350
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

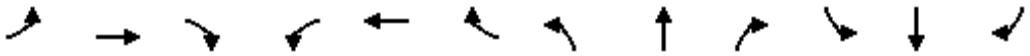
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	15	21.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	393	-	-	476	-	-	350
HCM Lane V/C Ratio	0.083	-	-	0.075	-	-	0.385
HCM Control Delay (s)	15	-	-	13.2	-	-	21.6
HCM Lane LOS	C	-	-	B	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-	-	1.8



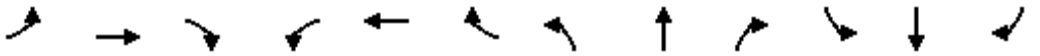
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	989	365	147	719	0	0	0	0	95	1	582
Future Volume (vph)	0	989	365	147	719	0	0	0	0	95	1	582
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.91	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		5085	1549	1593	3539						1775	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		5085	1549	1593	3539						1775	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1009	372	150	734	0	0	0	0	97	1	594
RTOR Reduction (vph)	0	0	232	0	0	0	0	0	0	0	0	196
Lane Group Flow (vph)	0	1009	140	150	734	0	0	0	0	0	98	398
Confl. Peds. (#/hr)			1									
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		33.9	33.9	12.8	50.9						29.4	29.4
Effective Green, g (s)		33.9	33.9	12.8	50.9						29.4	29.4
Actuated g/C Ratio		0.38	0.38	0.14	0.57						0.33	0.33
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		1915	583	226	2001						579	517
v/s Ratio Prot		c0.20		c0.09	0.21						0.06	
v/s Ratio Perm			0.09									c0.25
v/c Ratio		0.53	0.24	0.66	0.37						0.17	0.77
Uniform Delay, d1		21.8	19.2	36.6	10.7						21.6	27.3
Progression Factor		0.94	2.78	0.86	0.89						1.00	1.00
Incremental Delay, d2		0.9	0.8	4.4	0.4						0.1	6.5
Delay (s)		21.4	54.4	35.8	9.9						21.7	33.8
Level of Service		C	D	D	A						C	C
Approach Delay (s)		30.3			14.3			0.0			32.1	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	606	476	0	0	517	142	348	4	161	0	0	0
Future Volume (vph)	606	476	0	0	517	142	348	4	161	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1593	3539			3539	1549		1775	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1593	3539			3539	1549		1775	1583			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	631	496	0	0	539	148	362	4	168	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	115	0	0	125	0	0	0
Lane Group Flow (vph)	631	496	0	0	539	33	0	367	43	0	0	0
Confl. Peds. (#/hr)			3			1						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	33.2	57.5			20.1	20.1		22.8	22.8			
Effective Green, g (s)	33.2	57.5			20.1	20.1		22.8	22.8			
Actuated g/C Ratio	0.37	0.64			0.22	0.22		0.25	0.25			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	587	2261			790	345		449	401			
v/s Ratio Prot	c0.40	0.14			c0.15			c0.21				
v/s Ratio Perm						0.02			0.03			
v/c Ratio	1.07	0.22			0.68	0.10		0.82	0.11			
Uniform Delay, d1	28.4	6.8			32.0	27.7		31.6	25.8			
Progression Factor	0.41	0.11			0.99	1.83		1.00	1.00			
Incremental Delay, d2	57.6	0.2			4.5	0.5		11.1	0.1			
Delay (s)	69.2	1.0			36.1	51.4		42.8	25.9			
Level of Service	E	A			D	D		D	C			
Approach Delay (s)		39.2			39.4			37.5			0.0	
Approach LOS		D			D			D			A	

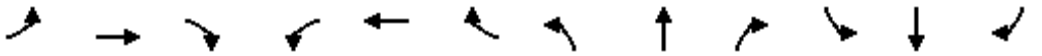
Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	392	3	1	422	66	3	3	1	62	4	234
Future Volume (vph)	236	392	3	1	422	66	3	3	1	62	4	234
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.95	1.00
Satd. Flow (prot)	3090	3539	1548	1593	3461			1817	1563		1779	1560
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.95	1.00
Satd. Flow (perm)	3090	3539	1548	1593	3461			1817	1563		1779	1560
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	251	417	3	1	449	70	3	3	1	66	4	249
RTOR Reduction (vph)	0	0	1	0	8	0	0	0	1	0	0	230
Lane Group Flow (vph)	251	417	2	1	511	0	0	6	0	0	70	19
Confl. Peds. (#/hr)			1			1			1			
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2						3			4
Actuated Green, G (s)	10.0	57.0	57.0	0.8	46.9			8.2	8.2		6.8	6.8
Effective Green, g (s)	10.0	57.0	57.0	0.8	46.9			8.2	8.2		6.8	6.8
Actuated g/C Ratio	0.11	0.63	0.63	0.01	0.52			0.09	0.09		0.08	0.08
Clearance Time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Vehicle Extension (s)	0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	343	2241	980	14	1803			165	142		134	117
v/s Ratio Prot	c0.08	0.12		0.00	c0.15			c0.00			c0.04	
v/s Ratio Perm			0.00						0.00			0.01
v/c Ratio	0.73	0.19	0.00	0.07	0.28			0.04	0.00		0.52	0.16
Uniform Delay, d1	38.7	6.9	6.1	44.2	12.1			37.3	37.2		40.0	38.9
Progression Factor	0.67	1.52	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.7	0.2	0.0	0.8	0.4			0.0	0.0		1.7	0.2
Delay (s)	32.5	10.6	6.1	45.0	12.5			37.3	37.2		41.7	39.2
Level of Service	C	B	A	D	B			D	D		D	D
Approach Delay (s)		18.7			12.6			37.3			39.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	384	1	0	394	23	7	0	1	10	0	80
Future Volume (Veh/h)	69	384	1	0	394	23	7	0	1	10	0	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	72	400	1	0	410	24	7	0	1	10	0	83
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	434			401			832	978	400	968	967	217
vC1, stage 1 conf vol							544	544		422	422	
vC2, stage 2 conf vol							288	434		546	545	
vCu, unblocked vol	434			306			775	933	306	922	921	217
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			98	100	100	97	100	89
cM capacity (veh/h)	1122			1152			402	397	636	399	417	787

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	473	205	229	8	10	83
Volume Left	72	0	0	7	10	0
Volume Right	1	0	24	1	0	83
cSH	1122	1152	1700	421	399	787
Volume to Capacity	0.06	0.00	0.13	0.02	0.03	0.11
Queue Length 95th (ft)	5	0	0	1	2	9
Control Delay (s)	1.9	0.0	0.0	13.7	14.3	10.1
Lane LOS	A			B	B	B
Approach Delay (s)	1.9	0.0		13.7	10.6	
Approach LOS				B	B	

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	51.9%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	380	9	5	404	14	4
Future Vol, veh/h	380	9	5	404	14	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	400	9	5	425	15	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	409	0	841	405
Stage 1	-	-	-	-	405	-
Stage 2	-	-	-	-	436	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1150	-	335	646
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1150	-	333	646
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	373	-	-	1150	-
HCM Lane V/C Ratio	0.051	-	-	0.005	-
HCM Control Delay (s)	15.2	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	370	6	1	396	12	1	3	2	13	2	9
Future Vol, veh/h	13	370	6	1	396	12	1	3	2	13	2	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	398	6	1	426	13	1	3	2	14	2	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	439	0	0	404	0	0	869	870	401	866	866	432
Stage 1	-	-	-	-	-	-	429	429	-	434	434	-
Stage 2	-	-	-	-	-	-	440	441	-	432	432	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1121	-	-	1155	-	-	272	290	649	274	291	624
Stage 1	-	-	-	-	-	-	604	584	-	600	581	-
Stage 2	-	-	-	-	-	-	596	577	-	602	582	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1121	-	-	1155	-	-	263	285	649	267	286	624
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	285	-	267	286	-
Stage 1	-	-	-	-	-	-	594	575	-	590	580	-
Stage 2	-	-	-	-	-	-	584	576	-	587	573	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	15.6	16.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	345	1121	-	-	1155	-	-	342
HCM Lane V/C Ratio	0.019	0.012	-	-	0.001	-	-	0.075
HCM Control Delay (s)	15.6	8.3	0	-	8.1	0	-	16.4
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	123	261	272	47	48	134
Future Vol, veh/h	123	261	272	47	48	134
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	141	300	313	54	55	154

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	367	0	-	0	923	340
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	583	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1192	-	-	-	299	702
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	558	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1192	-	-	-	264	702
Mov Cap-2 Maneuver	-	-	-	-	264	-
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	492	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	17.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1192	-	-	-	488
HCM Lane V/C Ratio	0.119	-	-	-	0.429
HCM Control Delay (s)	8.4	-	-	-	17.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	2.1

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	193	124	107	16	13	214
Future Vol, veh/h	193	124	107	16	13	214
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	217	139	120	18	15	240

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	138	0	-	0	702	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	573	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1446	-	-	-	404	921
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1446	-	-	-	343	921
Mov Cap-2 Maneuver	-	-	-	-	343	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	479	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1446	-	-	-	840
HCM Lane V/C Ratio	0.15	-	-	-	0.304
HCM Control Delay (s)	7.9	-	-	-	11.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	1.3

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	188	214	21	23	41
Future Vol, veh/h	29	188	214	21	23	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	196	223	22	24	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	245	0	-	0	490	234
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	256	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1321	-	-	-	537	805
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	787	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1321	-	-	-	524	805
Mov Cap-2 Maneuver	-	-	-	-	524	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1321	-	-	-	675
HCM Lane V/C Ratio	0.023	-	-	-	0.099
HCM Control Delay (s)	7.8	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

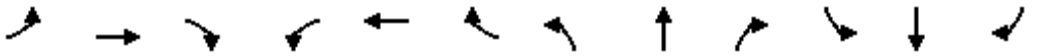
Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	66	128	148	33	43	68
Future Vol, veh/h	66	128	148	33	43	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	136	157	35	46	72

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	157	0	-	0	434	157
Stage 1	-	-	-	-	157	-
Stage 2	-	-	-	-	277	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1423	-	-	-	579	889
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1423	-	-	-	551	889
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	732	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1423	-	-	-	718
HCM Lane V/C Ratio	0.049	-	-	-	0.164
HCM Control Delay (s)	7.7	-	-	-	11
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	6	58	2	7	9	62	279	6	8	250	120
Future Volume (vph)	114	6	58	2	7	9	62	279	6	8	250	120
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1568		1593	1670		1593	1856		1593	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1568		1593	1670		1593	1856		1593	1863	1548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	120	6	61	2	7	9	65	294	6	8	263	126
RTOR Reduction (vph)	0	49	0	0	9	0	0	1	0	0	0	85
Lane Group Flow (vph)	120	18	0	2	7	0	65	299	0	8	263	41
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			4			1			2			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.0	9.3		0.6	0.9		3.8	18.4		0.6	15.2	15.2
Effective Green, g (s)	9.0	9.3		0.6	0.9		3.8	18.4		0.6	15.2	15.2
Actuated g/C Ratio	0.19	0.20		0.01	0.02		0.08	0.39		0.01	0.32	0.32
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	305	310		20	32		129	728		20	603	501
v/s Ratio Prot	c0.08	0.01		0.00	c0.00		c0.04	c0.16		0.01	0.14	
v/s Ratio Perm												0.03
v/c Ratio	0.39	0.06		0.10	0.22		0.50	0.41		0.40	0.44	0.08
Uniform Delay, d1	16.6	15.2		22.9	22.7		20.6	10.3		23.0	12.5	11.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1		2.2	3.5		3.1	0.4		12.6	0.5	0.1
Delay (s)	17.4	15.3		25.1	26.2		23.7	10.7		35.6	13.0	11.1
Level of Service	B	B		C	C		C	B		D	B	B
Approach Delay (s)		16.7			26.1			13.0			12.8	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	0	5	515	0	30	58	4	222	211	90	258
Future Volume (vph)	5	0	5	515	0	30	58	4	222	211	90	258
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3535
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3535
Peak-hour factor, PHF	0.93	0.92	0.93	0.92	0.92	0.92	0.92	0.93	0.93	0.92	0.92	0.93
Adj. Flow (vph)	5	0	5	560	0	33	63	4	239	229	98	277
RTOR Reduction (vph)	0	0	5	0	0	23	0	0	0	170	0	1
Lane Group Flow (vph)	0	5	0	280	280	10	0	67	239	59	98	278
Confl. Bikes (#/hr)												
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		0.8	0.8	19.7	19.7	19.7		4.4	16.0	16.0	7.0	18.6
Effective Green, g (s)		0.8	0.8	19.7	19.7	19.7		4.4	16.0	16.0	7.0	18.6
Actuated g/C Ratio		0.01	0.01	0.32	0.32	0.32		0.07	0.26	0.26	0.11	0.30
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		22	20	478	531	500		112	478	406	178	1055
v/s Ratio Prot		c0.00		c0.19	0.17			0.04	c0.13		c0.06	c0.08
v/s Ratio Perm			0.00			0.01				0.04		
v/c Ratio		0.23	0.00	0.59	0.53	0.02		0.60	0.50	0.14	0.55	0.26
Uniform Delay, d1		30.4	30.4	17.9	17.5	14.7		28.1	19.7	17.9	26.2	16.6
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.9	0.0	1.8	0.9	0.0		5.6	1.7	0.3	3.7	0.3
Delay (s)		32.4	30.4	19.7	18.4	14.7		33.7	21.4	18.2	29.8	16.9
Level of Service		C	C	B	B	B		C	C	B	C	B
Approach Delay (s)		31.4			18.8				21.6			20.3
Approach LOS		C			B				C			C

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	18.8
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	2
Future Volume (vph)	2
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	2
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	6	255	13	4	274
Future Vol, veh/h	11	6	255	13	4	274
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	7	277	14	4	298

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	591	284	0	0	291	0
Stage 1	284	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	470	755	-	-	1271	-
Stage 1	764	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	468	755	-	-	1271	-
Mov Cap-2 Maneuver	557	-	-	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	743	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	614	1271	-
HCM Lane V/C Ratio	-	-	0.03	0.003	-
HCM Control Delay (s)	-	-	11	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	30	248	14	29	268
Future Vol, veh/h	14	30	248	14	29	268
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	32	261	15	31	282

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	612	269	0	0	277	0
Stage 1	269	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	456	770	-	-	1286	-
Stage 1	776	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	442	769	-	-	1286	-
Mov Cap-2 Maneuver	536	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	676	1286	-
HCM Lane V/C Ratio	-	-	0.069	0.024	-
HCM Control Delay (s)	-	-	10.7	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

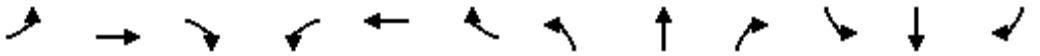
Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	1	3	47	2	24	3	240	36	24	241	4
Future Vol, veh/h	5	1	3	47	2	24	3	240	36	24	241	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1	3	50	2	26	3	255	38	26	256	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	605	611	259	594	594	275	261	0	0	295	0	0
Stage 1	310	310	-	282	282	-	-	-	-	-	-	-
Stage 2	295	301	-	312	312	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	410	409	780	417	418	764	1303	-	-	1266	-	-
Stage 1	700	659	-	725	678	-	-	-	-	-	-	-
Stage 2	713	665	-	699	658	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	387	398	780	406	406	763	1303	-	-	1266	-	-
Mov Cap-2 Maneuver	387	398	-	406	406	-	-	-	-	-	-	-
Stage 1	698	643	-	722	675	-	-	-	-	-	-	-
Stage 2	685	662	-	678	642	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	13.9	0.1	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1303	-	-	467	480	1266	-	-
HCM Lane V/C Ratio	0.002	-	-	0.021	0.162	0.02	-	-
HCM Control Delay (s)	7.8	0	-	12.9	13.9	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	167	106	137	186	92	85	186	101	99	154	29
Future Volume (vph)	16	167	106	137	186	92	85	186	101	99	154	29
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1561	1593	3539	1558	1593	3337		1593	3447	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1561	1593	3539	1558	1593	3337		1593	3447	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	178	113	146	198	98	90	198	107	105	164	31
RTOR Reduction (vph)	0	0	86	0	0	63	0	68	0	0	14	0
Lane Group Flow (vph)	17	178	27	146	198	35	90	237	0	105	181	0
Confl. Peds. (#/hr)						6			2			5
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	0.9	14.6	14.6	8.5	22.2	22.2	6.7	14.3		7.2	14.8	
Effective Green, g (s)	0.9	14.6	14.6	8.5	22.2	22.2	6.7	14.3		7.2	14.8	
Actuated g/C Ratio	0.01	0.24	0.24	0.14	0.36	0.36	0.11	0.23		0.12	0.24	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	23	838	369	219	1275	561	173	774		186	828	
v/s Ratio Prot	0.01	c0.05		c0.09	0.06		0.06	c0.07		c0.07	0.05	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.74	0.21	0.07	0.67	0.16	0.06	0.52	0.31		0.56	0.22	
Uniform Delay, d1	30.2	18.9	18.2	25.2	13.3	12.9	25.9	19.5		25.7	18.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	69.6	0.3	0.2	5.8	0.1	0.1	1.3	0.5		2.3	0.3	
Delay (s)	99.8	19.1	18.4	31.0	13.5	13.0	27.2	20.0		28.0	19.0	
Level of Service	F	B	B	C	B	B	C	C		C	B	
Approach Delay (s)		23.3			19.2			21.7			22.2	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	1	8	303	296	11
Future Vol, veh/h	5	1	8	303	296	11
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	145	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1	8	316	308	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	490	162	322	0	-	0
Stage 1	316	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	507	854	1235	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	839	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	502	852	1235	-	-	-
Mov Cap-2 Maneuver	502	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	832	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1235	-	539	-	-
HCM Lane V/C Ratio	0.007	-	0.012	-	-
HCM Control Delay (s)	7.9	-	11.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

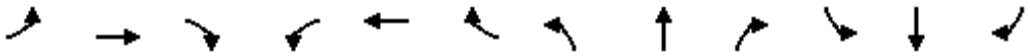
Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	31	304	7	36	300
Future Vol, veh/h	8	31	304	7	36	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	33	327	8	39	323

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	570	167	0	0	334	0
Stage 1	331	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	452	848	-	-	1222	-
Stage 1	700	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	434	848	-	-	1222	-
Mov Cap-2 Maneuver	528	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	748	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	1
HCM LOS	B		

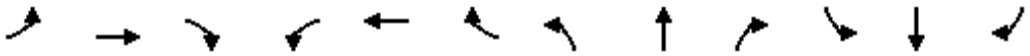
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	754	1222	-
HCM Lane V/C Ratio	-	-	0.056	0.032	-
HCM Control Delay (s)	-	-	10.1	8	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	5	16	3	9	7	24	312	3	6	346	50
Future Volume (vph)	34	5	16	3	9	7	24	312	3	6	346	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.95		1.00	1.00		1.00	0.98	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1729			1754		1593	3534		1593	3463	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1729			1754		1593	3534		1593	3463	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	5	17	3	10	8	26	335	3	6	372	54
RTOR Reduction (vph)	0	16	0	0	8	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	43	0	0	13	0	26	338	0	6	418	0
Confl. Peds. (#/hr)			2						1			
Confl. Bikes (#/hr)									2			1
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		4.3			0.7		0.8	27.1		0.6	26.9	
Effective Green, g (s)		4.3			0.7		0.8	27.1		0.6	26.9	
Actuated g/C Ratio		0.09			0.01		0.02	0.55		0.01	0.55	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		151			24		25	1946		19	1893	
v/s Ratio Prot		c0.03			c0.01		c0.02	0.10		0.00	c0.12	
v/s Ratio Perm												
v/c Ratio		0.29			0.55		1.04	0.17		0.32	0.22	
Uniform Delay, d1		21.0			24.1		24.2	5.5		24.1	5.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			12.9		192.8	0.1		3.5	0.1	
Delay (s)		21.4			37.0		217.0	5.6		27.6	5.9	
Level of Service		C			D		F	A		C	A	
Approach Delay (s)		21.4			37.0			20.7			6.2	
Approach LOS		C			D			C			A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	49.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

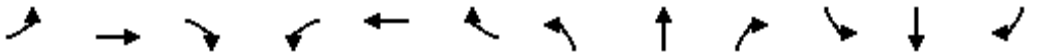
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	0	11	1	0	0	10	415	2	13	482	16
Future Volume (vph)	15	0	11	1	0	0	10	415	2	13	482	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1695			1770		1593	3536		1593	3520	
Flt Permitted		0.82			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1435			1863		1593	3536		1593	3520	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	16	0	12	1	0	0	11	446	2	14	518	17
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	2	0	0	1	0	11	448	0	14	533	0
Confl. Peds. (#/hr)			5			8			7			
Confl. Bikes (#/hr)									1			3
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		3.9			0.6		0.7	31.8		0.7	31.8	
Effective Green, g (s)		3.9			0.6		0.7	31.8		0.7	31.8	
Actuated g/C Ratio		0.07			0.01		0.01	0.59		0.01	0.59	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		104			20		20	2101		20	2092	
v/s Ratio Prot							0.01	0.13		c0.01	c0.15	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.02			0.05		0.55	0.21		0.70	0.25	
Uniform Delay, d1		23.0			26.2		26.2	5.0		26.3	5.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.4		17.2	0.2		61.0	0.2	
Delay (s)		23.1			26.5		43.5	5.2		87.3	5.4	
Level of Service		C			C		D	A		F	A	
Approach Delay (s)		23.1			26.5			6.1			7.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	211	50	142	246	302	66	302	125	267	344	127
Future Volume (vph)	89	211	50	142	246	302	66	302	125	267	344	127
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1546	1593	3539	1552	1593	3365		1593	3380	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1546	1593	3539	1552	1593	3365		1593	3380	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	222	53	149	259	318	69	318	132	281	362	134
RTOR Reduction (vph)	0	0	43	0	0	233	0	32	0	0	23	0
Lane Group Flow (vph)	94	222	10	149	259	85	69	418	0	281	473	0
Confl. Peds. (#/hr)			4			10			5			4
Confl. Bikes (#/hr)			7						2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.2	16.8	16.8	13.6	24.2	24.2	7.3	20.8		23.3	36.5	
Effective Green, g (s)	6.2	16.8	16.8	13.6	24.2	24.2	7.3	20.8		23.3	36.5	
Actuated g/C Ratio	0.07	0.19	0.19	0.15	0.27	0.27	0.08	0.23		0.26	0.40	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	211	655	286	238	944	414	128	771		409	1360	
v/s Ratio Prot	0.03	c0.06		c0.09	0.07		0.04	c0.12		c0.18	0.14	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.45	0.34	0.03	0.63	0.27	0.20	0.54	0.54		0.69	0.35	
Uniform Delay, d1	40.6	32.1	30.3	36.2	26.3	25.8	40.1	30.8		30.4	18.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6	0.1	3.7	0.3	0.5	2.2	1.4		3.8	0.3	
Delay (s)	41.1	32.8	30.4	39.8	26.6	26.3	42.3	32.1		34.2	19.2	
Level of Service	D	C	C	D	C	C	D	C		C	B	
Approach Delay (s)		34.6			29.2			33.5			24.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	10	259	25	19	266
Future Vol, veh/h	80	10	259	25	19	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	11	282	27	21	289

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	625	295	0	0	309	0
Stage 1	295	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	449	744	-	-	1252	-
Stage 1	755	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	441	744	-	-	1252	-
Mov Cap-2 Maneuver	441	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	716	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	462	1252	-
HCM Lane V/C Ratio	-	-	0.212	0.016	-
HCM Control Delay (s)	-	-	14.9	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	110	354	195	0	844
Future Vol, veh/h	0	110	354	195	0	844
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	120	385	212	0	917

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	298	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	698	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	698	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	698	-
HCM Lane V/C Ratio	-	-	0.171	-
HCM Control Delay (s)	-	-	11.2	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.6	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	80	60	300	85	280	5	55	700	365	225	295
Future Volume (vph)	10	80	60	300	85	280	5	55	700	365	225	295
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1490	3312	1461	2891	1520	1408		1490	3312	1482	2891	3312
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1490	3312	1461	2891	1520	1408		1490	3312	1482	2891	3312
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	11	91	68	341	97	318	6	62	795	415	256	335
RTOR Reduction (vph)	0	0	57	0	34	156	0	0	0	171	0	0
Lane Group Flow (vph)	11	91	11	341	181	44	0	69	795	244	256	335
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot	NA
Protected Phases	8	8		7	7		1	1	6	7	5	2
Permitted Phases			8			7				6		
Actuated Green, G (s)	18.2	18.2	18.2	24.0	24.0	24.0		9.4	31.9	55.9	15.6	38.1
Effective Green, g (s)	18.2	18.2	18.2	24.0	24.0	24.0		9.4	31.9	55.9	15.6	38.1
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22	0.22		0.09	0.29	0.51	0.14	0.35
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	3.0	5.0
Lane Grp Cap (vph)	246	548	242	631	332	307		127	962	754	410	1149
v/s Ratio Prot	0.01	c0.03		0.12	c0.12			0.05	c0.24	0.07	c0.09	0.10
v/s Ratio Perm			0.01			0.03				0.09		
v/c Ratio	0.04	0.17	0.05	0.54	0.54	0.14		0.54	0.83	0.32	0.62	0.29
Uniform Delay, d1	38.5	39.3	38.5	38.0	38.0	34.6		48.1	36.4	15.8	44.3	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.1	0.9	1.8	0.2		4.7	6.6	0.3	3.0	0.3
Delay (s)	38.6	39.4	38.6	39.0	39.9	34.8		52.8	43.0	16.1	47.3	26.3
Level of Service	D	D	D	D	D	C		D	D	B	D	C
Approach Delay (s)		39.0			38.1				34.8			35.3
Approach LOS		D			D				C			D

Intersection Summary			
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	20.1
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1448
Flt Permitted	1.00
Satd. Flow (perm)	1448
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	6
RTOR Reduction (vph)	4
Lane Group Flow (vph)	2
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	9%
Turn Type	Perm
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	38.1
Effective Green, g (s)	38.1
Actuated g/C Ratio	0.35
Clearance Time (s)	6.5
Vehicle Extension (s)	5.0
Lane Grp Cap (vph)	502
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	23.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	23.5
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	30	80	555	40	225	510	100	100	130	525	75	55
Future Volume (vph)	30	80	555	40	225	510	100	100	130	525	75	55
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900
Total Lost time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1533	3406	1524	1533	3406	1485	1533	1792	1524	1533	1670
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1533	3406	1524	1533	3406	1485	1533	1792	1524	1533	1670
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	89	617	44	250	567	111	111	144	583	83	61
RTOR Reduction (vph)	0	0	0	31	0	0	67	0	0	480	0	20
Lane Group Flow (vph)	0	122	617	13	250	567	44	111	144	103	83	85
Confl. Peds. (#/hr)							3					
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			6			3		
Actuated Green, G (s)		12.6	28.5	28.5	21.2	37.1	37.1	14.3	14.3	14.3	12.7	12.7
Effective Green, g (s)		12.6	28.5	28.5	21.2	37.1	37.1	14.3	14.3	14.3	12.7	12.7
Actuated g/C Ratio		0.13	0.30	0.30	0.23	0.39	0.39	0.15	0.15	0.15	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0	2.0	8.0	8.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		205	1030	461	345	1341	584	232	272	231	206	225
v/s Ratio Prot		0.08	c0.18		c0.16	0.17		0.07	c0.08		c0.05	0.05
v/s Ratio Perm				0.01			0.03			0.07		
v/c Ratio		0.60	0.60	0.03	0.72	0.42	0.07	0.48	0.53	0.45	0.40	0.38
Uniform Delay, d1		38.4	28.0	23.1	33.8	20.8	17.8	36.5	36.8	36.3	37.3	37.2
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.1	2.4	0.1	6.3	0.9	0.2	0.6	0.9	0.5	0.5	0.4
Delay (s)		41.5	30.4	23.2	40.1	21.7	18.1	37.1	37.7	36.8	37.8	37.5
Level of Service		D	C	C	D	C	B	D	D	D	D	D
Approach Delay (s)			31.7			26.2			37.0			37.6
Approach LOS			C			C			D			D

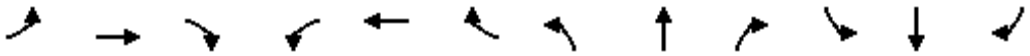
Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	94.2	Sum of lost time (s)	17.5
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	44
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1060	25	40	760	325	5	5	15	255	15	45
Future Volume (vph)	40	1060	25	40	760	325	5	5	15	255	15	45
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (prot)	1533	3394		1533	3406	1486		1628			1686	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (perm)	1533	3394		1533	3406	1486		1628			1686	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	49	1309	31	49	938	401	6	6	19	315	19	56
RTOR Reduction (vph)	0	1	0	0	0	240	0	18	0	0	4	0
Lane Group Flow (vph)	49	1339	0	49	938	161	0	13	0	0	386	0
Confl. Peds. (#/hr)						3						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						
Actuated Green, G (s)	4.7	35.4		4.7	35.0	35.0		3.3			26.0	
Effective Green, g (s)	4.7	35.4		4.7	35.0	35.0		3.3			26.0	
Actuated g/C Ratio	0.05	0.41		0.05	0.40	0.40		0.04			0.30	
Clearance Time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Vehicle Extension (s)	2.0	7.9		2.0	7.3	7.3		2.0			2.0	
Lane Grp Cap (vph)	82	1377		82	1367	596		61			502	
v/s Ratio Prot	c0.03	c0.39		0.03	0.28			c0.01			c0.23	
v/s Ratio Perm						0.11						
v/c Ratio	0.60	0.97		0.60	0.69	0.27		0.21			0.77	
Uniform Delay, d1	40.3	25.4		40.3	21.6	17.5		40.7			27.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	7.6	18.5		7.6	2.6	0.9		0.6			6.3	
Delay (s)	47.9	43.9		47.9	24.2	18.4		41.3			34.1	
Level of Service	D	D		D	C	B		D			C	
Approach Delay (s)		44.0			23.4			41.3			34.1	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	18.2
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1285	10	5	5	1090	35	5	0	10	30	0
Future Volume (vph)	15	1285	10	5	5	1090	35	5	0	10	30	0
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Frt	1.00	1.00			1.00	1.00			0.91			0.95
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.97
Satd. Flow (prot)	1518	3369			1518	3356			1589			1631
Flt Permitted	0.95	1.00			0.95	1.00			0.92			0.81
Satd. Flow (perm)	1518	3369			1518	3356			1480			1353
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	18	1548	12	6	6	1313	42	6	0	12	36	0
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	17	0	0	57
Lane Group Flow (vph)	18	1560	0	0	12	1354	0	0	1	0	0	3
Confl. Peds. (#/hr)			1				1					
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	2.8	80.3			1.4	78.9			4.6			4.6
Effective Green, g (s)	2.8	80.3			1.4	78.9			4.6			4.6
Actuated g/C Ratio	0.03	0.80			0.01	0.79			0.05			0.05
Clearance Time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Vehicle Extension (s)	2.0	7.3			2.0	7.3			2.0			2.0
Lane Grp Cap (vph)	42	2705			21	2647			68			62
v/s Ratio Prot	c0.01	c0.46			0.01	0.40						
v/s Ratio Perm									0.00			c0.00
v/c Ratio	0.43	0.58			0.57	0.51			0.01			0.04
Uniform Delay, d1	47.8	3.6			49.0	3.7			45.5			45.6
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	2.5	0.9			21.2	0.7			0.0			0.1
Delay (s)	50.4	4.5			70.2	4.4			45.6			45.7
Level of Service	D	A			E	A			D			D
Approach Delay (s)		5.0				5.0			45.6			45.7
Approach LOS		A				A			D			D

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	7%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	275	1000	15	5	30	985	320	15	15	20	145	5
Future Volume (vph)	275	1000	15	5	30	985	320	15	15	20	145	5
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (prot)	1533	3398			1533	3406	1524		1749	1524	1456	1627
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (perm)	1533	3398			1533	3406	1524		1749	1524	1456	1627
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	312	1136	17	6	34	1119	364	17	17	23	165	6
RTOR Reduction (vph)	0	1	0	0	0	0	208	0	0	22	0	0
Lane Group Flow (vph)	313	1152	0	0	40	1119	156	0	34	1	86	85
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	22.3	58.0			3.9	38.6	38.6		3.3	3.3	8.1	8.1
Effective Green, g (s)	22.3	58.0			3.9	38.6	38.6		3.3	3.3	8.1	8.1
Actuated g/C Ratio	0.25	0.64			0.04	0.43	0.43		0.04	0.04	0.09	0.09
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	379	2189			66	1460	653		64	55	131	146
v/s Ratio Prot	c0.20	0.34			0.03	c0.33			c0.02		c0.06	0.05
v/s Ratio Perm							0.10			0.00		
v/c Ratio	0.83	0.53			0.61	0.77	0.24		0.53	0.02	0.66	0.58
Uniform Delay, d1	32.0	8.6			42.3	21.9	16.4		42.6	41.8	39.6	39.3
Progression Factor	1.00	1.00			1.15	0.68	0.53		1.00	1.00	1.00	1.00
Incremental Delay, d2	13.1	0.9			9.0	3.4	0.7		4.2	0.0	8.7	3.8
Delay (s)	45.1	9.5			57.5	18.3	9.5		46.8	41.8	48.3	43.1
Level of Service	D	A			E	B	A		D	D	D	D
Approach Delay (s)		17.1				17.2			44.8			41.7
Approach LOS		B				B			D			D

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	155
Future Volume (vph)	155
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	176
RTOR Reduction (vph)	160
Lane Group Flow (vph)	16
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.1
Effective Green, g (s)	8.1
Actuated g/C Ratio	0.09
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	137
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.12
Uniform Delay, d1	37.7
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	37.8
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

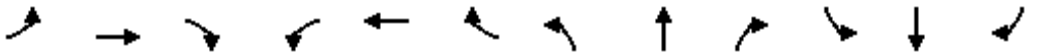
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1165	5	25	1330	0	30
Future Vol, veh/h	1165	5	25	1330	0	30
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	1324	6	28	1511	0	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1331	0	-	666
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	5.42	-	-	7.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.16	-	-	3.96
Pot Cap-1 Maneuver	-	-	260	-	0	337
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	260	-	-	337
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	16.9
HCM LOS			C

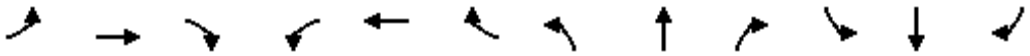
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	337	-	-	260	-
HCM Lane V/C Ratio	0.101	-	-	0.109	-
HCM Control Delay (s)	16.9	-	-	20.5	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	890	275	250	790	0	0	0	0	190	0	555
Future Volume (vph)	0	890	275	250	790	0	0	0	0	190	0	555
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6285	1517	1562	3471						1736	1553
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6285	1517	1562	3471						1736	1553
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	1047	324	294	929	0	0	0	0	224	0	653
RTOR Reduction (vph)	0	0	229	0	0	0	0	0	0	0	0	134
Lane Group Flow (vph)	0	1047	95	294	929	0	0	0	0	0	224	519
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		26.5	26.5	19.2	49.9						30.4	30.4
Effective Green, g (s)		26.5	26.5	19.2	49.9						30.4	30.4
Actuated g/C Ratio		0.29	0.29	0.21	0.55						0.34	0.34
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		1850	446	333	1924						586	524
v/s Ratio Prot		c0.17		c0.19	0.27						0.13	
v/s Ratio Perm			0.06									c0.33
v/c Ratio		0.57	0.21	0.88	0.48						0.38	0.99
Uniform Delay, d1		26.9	23.9	34.3	12.2						22.7	29.7
Progression Factor		0.81	0.55	0.87	1.02						1.00	1.00
Incremental Delay, d2		1.2	1.0	16.6	0.6						0.3	36.8
Delay (s)		23.0	14.1	46.5	13.0						23.0	66.5
Level of Service		C	B	D	B						C	E
Approach Delay (s)		20.9			21.0			0.0			55.4	
Approach LOS		C			C			A			E	

Intersection Summary				
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9	
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	615	0	0	640	520	410	0	265	0	0	0
Future Volume (vph)	470	615	0	0	640	520	410	0	265	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	534	699	0	0	727	591	466	0	301	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	303	0	0	179	0	0	0
Lane Group Flow (vph)	534	699	0	0	727	288	0	466	122	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	19.7	54.7			30.8	30.8		25.6	25.6			
Effective Green, g (s)	19.7	54.7			30.8	30.8		25.6	25.6			
Actuated g/C Ratio	0.22	0.61			0.34	0.34		0.28	0.28			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	669	2130			1199	536		498	446			
v/s Ratio Prot	c0.17	0.20			c0.21			c0.27				
v/s Ratio Perm						0.18			0.08			
v/c Ratio	0.80	0.33			0.61	0.54		0.94	0.27			
Uniform Delay, d1	33.3	8.6			24.6	23.9		31.4	25.0			
Progression Factor	0.46	0.07			1.20	2.06		1.00	1.00			
Incremental Delay, d2	5.8	0.4			2.0	3.3		25.2	0.4			
Delay (s)	21.2	1.0			31.4	52.4		56.6	25.3			
Level of Service	C	A			C	D		E	C			
Approach Delay (s)		9.8			40.8			44.3			0.0	
Approach LOS		A			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

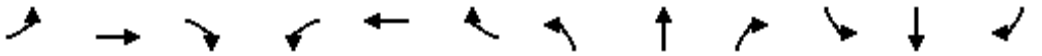
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	350	355	170	65	585	130	160	30	65	70	25
Future Volume (vph)	15	350	355	170	65	585	130	160	30	65	70	25
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3090	3539	1549	1593	3434			1788	1558		1796
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3090	3539	1549	1593	3434			1788	1558		1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	368	374	179	68	616	137	168	32	68	74	26
RTOR Reduction (vph)	0	0	0	90	0	15	0	0	0	57	0	0
Lane Group Flow (vph)	0	384	374	89	68	738	0	0	200	11	0	100
Confl. Peds. (#/hr)				1			2			4		
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		13.9	44.5	44.5	5.7	35.4			14.1	14.1		8.5
Effective Green, g (s)		13.9	44.5	44.5	5.7	35.4			14.1	14.1		8.5
Actuated g/C Ratio		0.15	0.49	0.49	0.06	0.39			0.16	0.16		0.09
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		477	1749	765	100	1350			280	244		169
v/s Ratio Prot		c0.12	0.11		0.04	c0.22			c0.11			c0.06
v/s Ratio Perm				0.06						0.01		
v/c Ratio		0.81	0.21	0.12	0.68	0.55			0.71	0.04		0.59
Uniform Delay, d1		36.7	12.9	12.2	41.3	21.1			36.0	32.2		39.1
Progression Factor		0.81	1.24	2.89	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		8.6	0.3	0.3	14.1	1.6			7.0	0.0		3.7
Delay (s)		38.4	16.2	35.6	55.3	22.7			43.0	32.3		42.7
Level of Service		D	B	D	E	C			D	C		D
Approach Delay (s)			29.0			25.4			40.3			39.1
Approach LOS			C			C			D			D

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	405
Future Volume (vph)	405
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	426
RTOR Reduction (vph)	386
Lane Group Flow (vph)	40
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.5
Effective Green, g (s)	8.5
Actuated g/C Ratio	0.09
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	149
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.27
Uniform Delay, d1	37.9
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	38.2
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	440	5	5	685	20	0	0	0	15	0	105
Future Volume (Veh/h)	45	440	5	5	685	20	0	0	0	15	0	105
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	51	494	6	6	770	22	0	0	0	17	0	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	792			500			1114	1403	497	1392	1395	396
vC1, stage 1 conf vol							599	599		793	793	
vC2, stage 2 conf vol							515	804		599	602	
vCu, unblocked vol	792			398			1075	1393	395	1381	1384	396
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			100	100	100	94	100	80
cM capacity (veh/h)	812			1037			289	284	543	274	309	598

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	551	391	407	0	17	118
Volume Left	51	6	0	0	17	0
Volume Right	6	0	22	0	0	118
cSH	812	1037	1700	1700	274	598
Volume to Capacity	0.06	0.01	0.24	0.00	0.06	0.20
Queue Length 95th (ft)	5	0	0	0	5	18
Control Delay (s)	1.7	0.2	0.0	0.0	19.0	12.5
Lane LOS	A	A		A	C	B
Approach Delay (s)	1.7	0.1		0.0	13.3	
Approach LOS				A	B	

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	59.0%	ICU Level of Service		B
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	405	55	25	670	20	10
Future Vol, veh/h	405	55	25	670	20	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	445	60	27	736	22	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	505	0	1266	475
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	791	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1044	-	184	584
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	441	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1044	-	176	584
Mov Cap-2 Maneuver	-	-	-	-	176	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	422	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	23.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	229	-	-	1044	-
HCM Lane V/C Ratio	0.144	-	-	0.026	-
HCM Control Delay (s)	23.3	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	400	10	5	665	5	15	0	5	10	0	20
Future Vol, veh/h	5	400	10	5	665	5	15	0	5	10	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	449	11	6	747	6	17	0	6	11	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	753	0	0	461	0	0	1238	1230	455	1230	1233	750
Stage 1	-	-	-	-	-	-	466	466	-	761	761	-
Stage 2	-	-	-	-	-	-	772	764	-	469	472	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	857	-	-	1100	-	-	152	178	605	154	177	411
Stage 1	-	-	-	-	-	-	577	562	-	398	414	-
Stage 2	-	-	-	-	-	-	392	413	-	575	559	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	857	-	-	1100	-	-	142	175	605	150	174	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	142	175	-	150	174	-
Stage 1	-	-	-	-	-	-	572	557	-	394	410	-
Stage 2	-	-	-	-	-	-	367	409	-	565	554	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	28.4	20.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	176	857	-	-	1100	-	-	260
HCM Lane V/C Ratio	0.128	0.007	-	-	0.005	-	-	0.13
HCM Control Delay (s)	28.4	9.2	0	-	8.3	0	-	20.9
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	110	305	460	55	40	195
Future Vol, veh/h	110	305	460	55	40	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	122	339	511	61	44	217

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	572	0	-	0	1125	542
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	583	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1001	-	-	-	227	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	558	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1001	-	-	-	199	540
Mov Cap-2 Maneuver	-	-	-	-	199	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	490	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	26.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1001	-	-	-	418
HCM Lane V/C Ratio	0.122	-	-	-	0.625
HCM Control Delay (s)	9.1	-	-	-	26.9
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	-	4.1

Intersection	
Int Delay, s/veh	11.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	285	60	160	45	45	360
Future Vol, veh/h	285	60	160	45	45	360
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	313	66	176	49	49	396

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	225	0	-	0	893	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	692	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1344	-	-	-	312	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	497	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1344	-	-	-	239	840
Mov Cap-2 Maneuver	-	-	-	-	239	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	21.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1344	-	-	-	657
HCM Lane V/C Ratio	0.233	-	-	-	0.677
HCM Control Delay (s)	8.5	-	-	-	21.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	-	5.3

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	240	335	30	40	70
Future Vol, veh/h	40	240	335	30	40	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	286	399	36	48	83

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	435	0	-	0	798	417
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1125	-	-	-	355	636
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1125	-	-	-	337	636
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	656	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1125	-	-	-	481
HCM Lane V/C Ratio	0.042	-	-	-	0.272
HCM Control Delay (s)	8.3	0	-	-	15.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

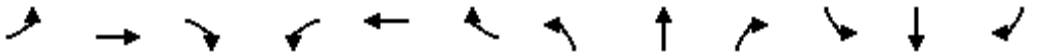
Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	50	245	215	30	70	110
Future Vol, veh/h	50	245	215	30	70	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	74	360	316	44	103	162

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	316	0	-	0	823	316
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	507	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1233	-	-	-	341	720
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	601	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1233	-	-	-	321	720
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	565	-

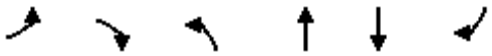
Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	21
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1233	-	-	-	485
HCM Lane V/C Ratio	0.06	-	-	-	0.546
HCM Control Delay (s)	8.1	-	-	-	21
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	3.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	20	125	10	10	10	65	360	15	15	400	130
Future Volume (vph)	210	20	125	10	10	10	65	360	15	15	400	130
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1547	1576		1547	1674		1547	1799		1547	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1547	1576		1547	1674		1547	1799		1547	1810	1538
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	250	24	149	12	12	12	77	429	18	18	476	155
RTOR Reduction (vph)	0	125	0	0	12	0	0	1	0	0	0	90
Lane Group Flow (vph)	250	48	0	12	12	0	77	446	0	18	476	65
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	8.7	9.2		0.7	1.2		5.1	28.0		0.7	23.6	23.6
Effective Green, g (s)	8.7	9.2		0.7	1.2		5.1	28.0		0.7	23.6	23.6
Actuated g/C Ratio	0.15	0.16		0.01	0.02		0.09	0.49		0.01	0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	237	256		19	35		139	889		19	754	641
v/s Ratio Prot	c0.16	c0.03		0.01	0.01		c0.05	c0.25		0.01	c0.26	
v/s Ratio Perm												0.04
v/c Ratio	1.05	0.19		0.63	0.35		0.55	0.50		0.95	0.63	0.10
Uniform Delay, d1	24.0	20.5		27.8	27.3		24.7	9.6		27.9	13.1	10.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	73.6	0.4		52.7	6.0		4.7	0.4		179.6	1.7	0.1
Delay (s)	97.6	20.8		80.6	33.3		29.4	10.1		207.5	14.8	10.1
Level of Service	F	C		F	C		C	B		F	B	B
Approach Delay (s)		66.2			49.0			12.9			19.0	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	5	225	400	285	40
Future Volume (vph)	10	5	225	400	285	40
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3473	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3473	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	13	6	285	506	361	51
RTOR Reduction (vph)	0	6	0	0	11	0
Lane Group Flow (vph)	13	0	285	506	401	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	0.8	0.8	12.2	30.7	15.0	
Effective Green, g (s)	0.8	0.8	12.2	30.7	15.0	
Actuated g/C Ratio	0.02	0.02	0.30	0.76	0.37	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	31	31	482	1419	1292	
v/s Ratio Prot	c0.01		c0.18	c0.27	0.12	
v/s Ratio Perm		0.00				
v/c Ratio	0.42	0.00	0.59	0.36	0.31	
Uniform Delay, d1	19.5	19.4	11.9	1.6	9.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	0.0	1.3	0.3	0.3	
Delay (s)	22.8	19.4	13.2	1.9	9.3	
Level of Service	C	B	B	A	A	
Approach Delay (s)	21.7			6.0	9.3	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	40.3	Sum of lost time (s)	12.3
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	20	375	20	10	310
Future Vol, veh/h	15	20	375	20	10	310
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	18	24	457	24	12	378

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	873	471	0	0	483	0
Stage 1	471	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	319	591	-	-	1074	-
Stage 1	626	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	314	590	-	-	1074	-
Mov Cap-2 Maneuver	437	-	-	-	-	-
Stage 1	625	-	-	-	-	-
Stage 2	664	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	513	1074	-
HCM Lane V/C Ratio	-	-	0.083	0.011	-
HCM Control Delay (s)	-	-	12.7	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	5	45	60	395	20	30	275
Future Vol, veh/h	5	45	60	395	20	30	275
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	0	-	-	0
Grade, %	-	0	-	0	-	-	0
Peak Hour Factor	92	79	79	79	79	79	79
Heavy Vehicles, %	2	3	3	3	3	3	3
Mvmt Flow	5	57	76	500	25	38	348

Major/Minor	Minor1			Major1		Major2	
Conflicting Flow All	0	937	513	0	0	525	0
Stage 1	0	513	-	-	-	-	-
Stage 2	0	424	-	-	-	-	-
Critical Hdwy	-	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	-	5.43	-	-	-	-	-
Critical Hdwy Stg 2	-	5.43	-	-	-	-	-
Follow-up Hdwy	-	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	0	293	559	-	-	1037	-
Stage 1	0	599	-	-	-	-	-
Stage 2	0	658	-	-	-	-	-
Platoon blocked, %	-			-	-		-
Mov Cap-1 Maneuver	0	280	559	-	-	1037	-
Mov Cap-2 Maneuver	0	408	-	-	-	-	-
Stage 1	0	599	-	-	-	-	-
Stage 2	0	628	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	482	1037	-
HCM Lane V/C Ratio	-	-	0.276	0.037	-
HCM Control Delay (s)	-	-	15.3	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

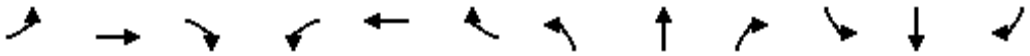
Intersection	
Int Delay, s/veh	15.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	5	60	5	130	5	360	70	85	260	10
Future Vol, veh/h	10	5	5	60	5	130	5	360	70	85	260	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	7	7	81	7	176	7	486	95	115	351	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1227	1183	358	1142	1142	534	365	0	0	581	0	0
Stage 1	588	588	-	547	547	-	-	-	-	-	-	-
Stage 2	639	595	-	595	595	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	155	189	686	177	200	546	1194	-	-	993	-	-
Stage 1	495	496	-	521	517	-	-	-	-	-	-	-
Stage 2	464	492	-	491	492	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	90	160	686	150	169	546	1194	-	-	993	-	-
Mov Cap-2 Maneuver	90	160	-	150	169	-	-	-	-	-	-	-
Stage 1	491	424	-	516	512	-	-	-	-	-	-	-
Stage 2	308	488	-	409	420	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.5	69.5	0.1	2.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1194	-	-	134	292	993	-	-
HCM Lane V/C Ratio	0.006	-	-	0.202	0.902	0.116	-	-
HCM Control Delay (s)	8	0	-	38.5	69.5	9.1	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	8.3	0.4	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	215	95	200	405	165	250	280	175	120	225	75
Future Volume (vph)	15	215	95	200	405	165	250	280	175	120	225	75
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1540	1593	3539	1549	1593	3312		1593	3390	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1540	1593	3539	1549	1593	3312		1593	3390	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	17	244	108	227	460	188	284	318	199	136	256	85
RTOR Reduction (vph)	0	0	88	0	0	111	0	91	0	0	33	0
Lane Group Flow (vph)	17	244	20	227	460	77	284	426	0	136	308	0
Confl. Peds. (#/hr)			1			9			4			6
Confl. Bikes (#/hr)			3			3			2			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.5	17.6	17.6	23.1	38.2	38.2	19.1	23.4		12.4	16.7	
Effective Green, g (s)	2.5	17.6	17.6	23.1	38.2	38.2	19.1	23.4		12.4	16.7	
Actuated g/C Ratio	0.03	0.19	0.19	0.25	0.41	0.41	0.20	0.25		0.13	0.18	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	42	666	289	393	1445	632	325	828		211	605	
v/s Ratio Prot	0.01	c0.07		c0.14	0.13		c0.18	c0.13		0.09	0.09	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.40	0.37	0.07	0.58	0.32	0.12	0.87	0.51		0.64	0.51	
Uniform Delay, d1	44.8	33.1	31.2	30.9	18.8	17.2	36.0	30.2		38.5	34.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.7	0.2	6.1	0.3	0.2	21.4	1.1		5.0	1.4	
Delay (s)	47.1	33.8	31.4	37.0	19.1	17.4	57.4	31.2		43.4	36.1	
Level of Service	D	C	C	D	B	B	E	C		D	D	
Approach Delay (s)		33.7			23.4			40.5			38.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	50	10	10	105	10	25	5	100	460	80	25	365
Future Volume (vph)	50	10	10	105	10	25	5	100	460	80	25	365
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.93		1.00	0.89			1.00	0.98		1.00	0.98
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1593	1723		1593	1664			1593	3460		1593	3460
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1593	1723		1593	1664			1593	3460		1593	3460
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	55	11	11	115	11	27	5	110	505	88	27	401
RTOR Reduction (vph)	0	11	0	0	24	0	0	0	11	0	0	10
Lane Group Flow (vph)	55	11	0	115	14	0	0	115	582	0	27	451
Confl. Peds. (#/hr)												
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	4.5	1.0		8.6	5.1			7.3	22.7		2.2	17.6
Effective Green, g (s)	4.5	1.0		8.6	5.1			7.3	22.7		2.2	17.6
Actuated g/C Ratio	0.09	0.02		0.16	0.10			0.14	0.43		0.04	0.34
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	136	32		260	161			221	1496		66	1159
v/s Ratio Prot	0.03	c0.01		c0.07	c0.01			c0.07	c0.17		0.02	0.13
v/s Ratio Perm												
v/c Ratio	0.40	0.35		0.44	0.08			0.52	0.39		0.41	0.39
Uniform Delay, d1	22.7	25.4		19.8	21.6			21.0	10.2		24.5	13.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	6.5		1.2	0.2			2.2	0.2		4.1	0.2
Delay (s)	24.7	32.0		21.0	21.8			23.2	10.3		28.6	13.6
Level of Service	C	C		C	C			C	B		C	B
Approach Delay (s)		26.8			21.2				12.4			14.4
Approach LOS		C			C				B			B

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	52.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	55
Future Volume (vph)	55
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	60
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

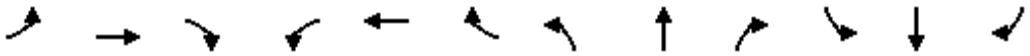
Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	65	470	10	40	335
Future Vol, veh/h	30	65	470	10	40	335
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	34	74	534	11	45	381

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	821	273	0	0	545	0
Stage 1	540	-	-	-	-	-
Stage 2	281	-	-	-	-	-
Critical Hdwy	6.88	6.98	-	-	4.18	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.34	-	-	2.24	-
Pot Cap-1 Maneuver	309	719	-	-	1006	-
Stage 1	543	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	291	719	-	-	1006	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	694	-	-	-	-	-

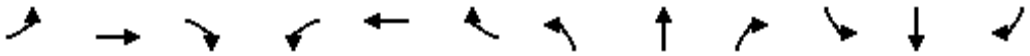
Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	579	1006	-
HCM Lane V/C Ratio	-	-	0.186	0.045	-
HCM Control Delay (s)	-	-	12.6	8.7	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	5	70	15	20	20	110	500	10	15	270	150
Future Volume (vph)	130	5	70	15	20	20	110	500	10	15	270	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.95		1.00	1.00		1.00	0.95	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1713			1747		1593	3528		1593	3315	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1713			1747		1593	3528		1593	3315	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	148	6	80	17	23	23	125	568	11	17	307	170
RTOR Reduction (vph)	0	19	0	0	22	0	0	1	0	0	77	0
Lane Group Flow (vph)	0	215	0	0	41	0	125	578	0	17	400	0
Confl. Peds. (#/hr)			7						1			8
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		14.0			3.7		8.0	28.2		0.9	21.1	
Effective Green, g (s)		14.0			3.7		8.0	28.2		0.9	21.1	
Actuated g/C Ratio		0.22			0.06		0.13	0.45		0.01	0.33	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		378			102		201	1571		22	1105	
v/s Ratio Prot		c0.13			c0.02		c0.08	c0.16		0.01	0.12	
v/s Ratio Perm												
v/c Ratio		0.57			0.41		0.62	0.37		0.77	0.36	
Uniform Delay, d1		22.0			28.7		26.2	11.6		31.1	16.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			1.0		4.3	0.3		87.1	0.4	
Delay (s)		23.1			29.7		30.5	11.9		118.2	16.4	
Level of Service		C			C		C	B		F	B	
Approach Delay (s)		23.1			29.7			15.2			19.9	
Approach LOS		C			C			B			B	

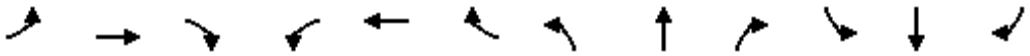
Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	65	55	45	0	10	35	700	60	190	565	55
Future Volume (vph)	70	65	55	45	0	10	35	700	60	190	565	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.91		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758			1588		1593	3488		1593	3479	
Flt Permitted		0.85			0.91		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1521			1501		1593	3488		1593	3479	
Peak-hour factor, PHF	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Adj. Flow (vph)	96	89	75	62	0	14	48	959	82	260	774	75
RTOR Reduction (vph)	0	10	0	0	73	0	0	5	0	0	5	0
Lane Group Flow (vph)	0	250	0	0	3	0	48	1036	0	260	844	0
Confl. Peds. (#/hr)						149			6			10
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		27.7			4.0		6.6	39.8		22.1	55.3	
Effective Green, g (s)		27.7			4.0		6.6	39.8		22.1	55.3	
Actuated g/C Ratio		0.25			0.04		0.06	0.36		0.20	0.50	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		382			54		95	1260		319	1747	
v/s Ratio Prot							0.03	c0.30		c0.16	0.24	
v/s Ratio Perm		c0.16			c0.00							
v/c Ratio		0.66			0.05		0.51	0.82		0.82	0.48	
Uniform Delay, d1		36.9			51.2		50.2	31.9		42.0	18.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.1			0.1		1.5	5.3		14.0	0.7	
Delay (s)		40.0			51.4		51.7	37.3		56.1	18.7	
Level of Service		D			D		D	D		E	B	
Approach Delay (s)		40.0			51.4			37.9			27.4	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

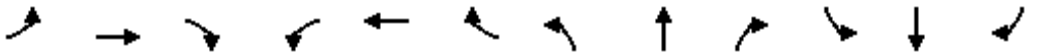
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	270	130	230	455	210	230	600	185	115	400	110
Future Volume (vph)	130	270	130	230	455	210	230	600	185	115	400	110
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1527	1593	3539	1531	1593	3386		1593	3408	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1527	1593	3539	1531	1593	3386		1593	3408	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	144	300	144	256	506	233	256	667	206	128	444	122
RTOR Reduction (vph)	0	0	97	0	0	130	0	19	0	0	19	0
Lane Group Flow (vph)	144	300	47	256	506	103	256	854	0	128	547	0
Confl. Peds. (#/hr)			24			21			19			8
Confl. Bikes (#/hr)			1			2			2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	9.8	24.1	24.1	21.7	36.0	36.0	17.2	31.7		13.5	27.7	
Effective Green, g (s)	9.8	24.1	24.1	21.7	36.0	36.0	17.2	31.7		13.5	27.7	
Actuated g/C Ratio	0.09	0.22	0.22	0.20	0.34	0.34	0.16	0.30		0.13	0.26	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	282	795	343	322	1188	514	255	1001		200	880	
v/s Ratio Prot	0.05	0.08		c0.16	c0.14		c0.16	c0.25		0.08	0.16	
v/s Ratio Perm			0.03			0.07						
v/c Ratio	0.51	0.38	0.14	0.80	0.43	0.20	1.00	0.85		0.64	0.62	
Uniform Delay, d1	46.4	35.2	33.2	40.6	27.6	25.3	45.0	35.6		44.5	35.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.6	0.4	11.9	0.5	0.4	57.4	7.8		5.1	1.9	
Delay (s)	47.1	35.8	33.6	52.5	28.1	25.7	102.4	43.4		49.7	37.1	
Level of Service	D	D	C	D	C	C	F	D		D	D	
Approach Delay (s)		38.0			33.8			56.8			39.4	
Approach LOS		D			C			E			D	

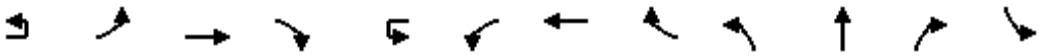
Intersection Summary			
HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	107.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	80	65	510	70	205	35	420	365	320	705	9
Future Volume (vph)	10	80	65	510	70	205	35	420	365	320	705	9
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1562	3471	1533	3030	1591	1456	1562	3471	1544	3030	3471	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1562	3471	1533	3030	1591	1456	1562	3471	1544	3030	3471	1520
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	83	68	531	73	214	36	438	380	333	734	9
RTOR Reduction (vph)	0	0	56	0	0	0	0	0	166	0	0	6
Lane Group Flow (vph)	10	83	12	531	150	137	36	438	214	333	734	3
Confl. Peds. (#/hr)			1									1
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	18.3	18.3	18.3	27.5	27.5	27.5	6.0	23.7	51.2	17.7	35.4	35.4
Effective Green, g (s)	18.3	18.3	18.3	27.5	27.5	27.5	6.0	23.7	51.2	17.7	35.4	35.4
Actuated g/C Ratio	0.17	0.17	0.17	0.26	0.26	0.26	0.06	0.22	0.48	0.16	0.33	0.33
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	266	591	261	776	407	373	87	766	736	499	1145	501
v/s Ratio Prot	0.01	c0.02		c0.18	0.09		0.02	0.13	0.07	c0.11	c0.21	
v/s Ratio Perm			0.01			0.09			0.06			0.00
v/c Ratio	0.04	0.14	0.04	0.68	0.37	0.37	0.41	0.57	0.29	0.67	0.64	0.01
Uniform Delay, d1	37.1	37.8	37.2	36.0	32.8	32.8	49.0	37.3	17.0	42.0	30.6	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.1	2.5	0.6	0.6	3.2	1.6	0.2	3.4	1.7	0.0
Delay (s)	37.2	37.9	37.3	38.5	33.3	33.4	52.1	38.9	17.2	45.4	32.2	24.1
Level of Service	D	D	D	D	C	C	D	D	B	D	C	C
Approach Delay (s)		37.6			36.7			29.8			36.2	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	20.1
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	15	45	570	85	5	485	625	40	70	50	385	85
Future Volume (vph)	15	45	570	85	5	485	625	40	70	50	385	85
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1900	1900	1710
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	16	49	626	93	5	533	687	44	77	55	423	93
RTOR Reduction (vph)	0	0	0	67	0	0	0	19	0	0	380	0
Lane Group Flow (vph)	0	65	626	26	0	538	687	25	77	55	43	93
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2				6			3	
Actuated Green, G (s)		7.4	29.3	29.3		37.1	59.0	59.0	10.6	10.6	10.6	10.9
Effective Green, g (s)		7.4	29.3	29.3		37.1	59.0	59.0	10.6	10.6	10.6	10.9
Actuated g/C Ratio		0.07	0.28	0.28		0.35	0.56	0.56	0.10	0.10	0.10	0.10
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		109	964	431		549	1942	851	157	183	156	161
v/s Ratio Prot		0.04	c0.18			c0.34	0.20		c0.05	0.03		c0.06
v/s Ratio Perm				0.02				0.02			0.03	
v/c Ratio		0.60	0.65	0.06		0.98	0.35	0.03	0.49	0.30	0.27	0.58
Uniform Delay, d1		47.6	33.5	27.9		33.8	12.7	10.4	44.8	44.0	43.8	45.1
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.7	3.3	0.3		32.7	0.5	0.1	0.9	0.3	0.3	3.1
Delay (s)		53.3	36.8	28.2		66.5	13.2	10.4	45.7	44.3	44.2	48.2
Level of Service		D	D	C		E	B	B	D	D	D	D
Approach Delay (s)			37.1				35.7			44.4		
Approach LOS			D				D			D		

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	105.4	Sum of lost time (s)	17.5
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	65	40
Future Volume (vph)	65	40
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.94	
Flt Protected	1.00	
Satd. Flow (prot)	1722	
Flt Permitted	1.00	
Satd. Flow (perm)	1722	
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	71	44
RTOR Reduction (vph)	17	0
Lane Group Flow (vph)	98	0
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	10.9	
Effective Green, g (s)	10.9	
Actuated g/C Ratio	0.10	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	178	
v/s Ratio Prot	0.06	
v/s Ratio Perm		
v/c Ratio	0.55	
Uniform Delay, d1	44.9	
Progression Factor	1.00	
Incremental Delay, d2	2.1	
Delay (s)	47.0	
Level of Service	D	
Approach Delay (s)	47.5	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	40	935	5	5	5	1045	210	10	15	10	335
Future Volume (vph)	5	40	935	5	5	5	1045	210	10	15	10	335
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		0.96		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (prot)		1577	3502			1577	3505	1533		1743		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (perm)		1577	3502			1577	3505	1533		1743		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	44	1039	6	6	6	1161	233	11	17	11	372
RTOR Reduction (vph)	0	0	0	0	0	0	0	141	0	10	0	0
Lane Group Flow (vph)	0	50	1045	0	0	12	1161	92	0	29	0	0
Confl. Peds. (#/hr)								1			1	
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.7	41.5			1.0	37.4	37.4		8.0		
Effective Green, g (s)		4.7	41.5			1.0	37.4	37.4		8.0		
Actuated g/C Ratio		0.05	0.44			0.01	0.39	0.39		0.08		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		77	1528			16	1378	602		146		
v/s Ratio Prot		c0.03	0.30			0.01	c0.33			c0.02		
v/s Ratio Perm								0.06				
v/c Ratio		0.65	0.68			0.75	0.84	0.15		0.20		
Uniform Delay, d1		44.4	21.5			46.9	26.2	18.6		40.6		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		13.3	2.5			97.6	5.9	0.4		0.2		
Delay (s)		57.6	24.0			144.5	32.1	19.1		40.8		
Level of Service		E	C			F	C	B		D		
Approach Delay (s)			25.6				30.9			40.8		
Approach LOS			C				C			D		

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



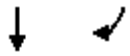
Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	5	35
Future Volume (vph)	5	35
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	0.96	
Satd. Flow (prot)	1736	
Flt Permitted	0.96	
Satd. Flow (perm)	1736	
Peak-hour factor, PHF	0.90	0.90
Adj. Flow (vph)	6	39
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	414	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	33%	3%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	26.8	
Effective Green, g (s)	26.8	
Actuated g/C Ratio	0.28	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	489	
v/s Ratio Prot	c0.24	
v/s Ratio Perm		
v/c Ratio	0.85	
Uniform Delay, d1	32.2	
Progression Factor	1.00	
Incremental Delay, d2	12.3	
Delay (s)	44.5	
Level of Service	D	
Approach Delay (s)	44.5	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	20	1270	5	5	20	1265	50	10	0	15	25
Future Volume (vph)	5	20	1270	5	5	20	1265	50	10	0	15	25
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			5.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1547	3436			1547	3415			1616		
Flt Permitted		0.95	1.00			0.95	1.00			0.85		
Satd. Flow (perm)		1547	3436			1547	3415			1403		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	21	1309	5	5	21	1304	52	10	0	15	26
RTOR Reduction (vph)	0	0	0	0	0	0	2	0	0	24	0	0
Lane Group Flow (vph)	0	26	1314	0	0	26	1354	0	0	1	0	0
Confl. Peds. (#/hr)				1				4			4	
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		3.4	67.6			3.0	67.2			5.2		
Effective Green, g (s)		3.4	67.6			3.0	67.2			5.2		
Actuated g/C Ratio		0.04	0.75			0.03	0.75			0.06		
Clearance Time (s)		3.5	5.7			3.5	5.7			5.0		
Vehicle Extension (s)		3.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		58	2580			51	2549			81		
v/s Ratio Prot		c0.02	0.38			0.02	c0.40					
v/s Ratio Perm										0.00		
v/c Ratio		0.45	0.51			0.51	0.53			0.02		
Uniform Delay, d1		42.4	4.5			42.8	4.8			40.0		
Progression Factor		1.00	1.00			1.20	1.42			1.00		
Incremental Delay, d2		5.4	0.7			2.4	0.7			0.0		
Delay (s)		47.8	5.2			53.9	7.5			40.0		
Level of Service		D	A			D	A			D		
Approach Delay (s)			6.1				8.3			40.0		
Approach LOS			A				A			D		

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	15
Future Volume (vph)	0	15
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	5.0	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1659	
Flt Permitted	0.79	
Satd. Flow (perm)	1357	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	0	15
RTOR Reduction (vph)	39	0
Lane Group Flow (vph)	2	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	5%	5%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	5.2	
Effective Green, g (s)	5.2	
Actuated g/C Ratio	0.06	
Clearance Time (s)	5.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	78	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.03	
Uniform Delay, d1	40.0	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	40.2	
Level of Service	D	
Approach Delay (s)	40.2	
Approach LOS	D	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	115	1090	25	5	15	1015	110	25	15	25	330	20
Future Volume (vph)	115	1090	25	5	15	1015	110	25	15	25	330	20
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		4.0	4.0	4.9	4.9
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (prot)	1577	3491			1577	3505	1568		1788	1568	1498	1678
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (perm)	1577	3491			1577	3505	1568		1788	1568	1498	1678
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	119	1124	26	5	15	1046	113	26	15	26	340	21
RTOR Reduction (vph)	0	1	0	0	0	0	60	0	0	25	0	0
Lane Group Flow (vph)	119	1149	0	0	20	1046	53	0	41	1	180	181
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	10.8	52.2			2.2	42.6	42.6		4.5	4.5	13.4	13.4
Effective Green, g (s)	10.8	52.2			2.2	42.6	42.6		4.5	4.5	13.4	13.4
Actuated g/C Ratio	0.12	0.58			0.02	0.47	0.47		0.05	0.05	0.15	0.15
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		4.0	4.0	4.9	4.9
Vehicle Extension (s)	1.5	1.5			0.5	1.5	1.5		0.5	0.5	0.5	0.5
Lane Grp Cap (vph)	189	2024			38	1659	742		89	78	223	249
v/s Ratio Prot	c0.08	0.33			0.01	c0.30			c0.02		c0.12	0.11
v/s Ratio Perm							0.03			0.00		
v/c Ratio	0.63	0.57			0.53	0.63	0.07		0.46	0.02	0.81	0.73
Uniform Delay, d1	37.7	11.8			43.4	17.8	12.9		41.6	40.6	37.1	36.6
Progression Factor	1.14	0.63			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	1.1			5.9	1.8	0.2		1.4	0.0	17.9	8.6
Delay (s)	47.4	8.5			49.3	19.6	13.1		42.9	40.7	55.0	45.2
Level of Service	D	A			D	B	B		D	D	D	D
Approach Delay (s)		12.1				19.5			42.1			43.4
Approach LOS		B				B			D			D

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	235
Future Volume (vph)	235
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.9
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	242
RTOR Reduction (vph)	206
Lane Group Flow (vph)	36
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	13.4
Effective Green, g (s)	13.4
Actuated g/C Ratio	0.15
Clearance Time (s)	4.9
Vehicle Extension (s)	0.5
Lane Grp Cap (vph)	233
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.15
Uniform Delay, d1	33.4
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	33.5
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

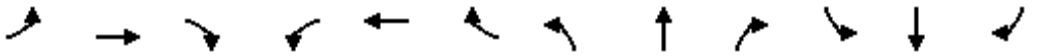
Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1430	20	5	1145	0	30
Future Vol, veh/h	1430	20	5	1145	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1554	22	5	1245	0	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1576	0	-	788
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	5.34	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.12	-	-	3.92
Pot Cap-1 Maneuver	-	-	204	-	0	287
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	204	-	-	287
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	19.1
HCM LOS			C

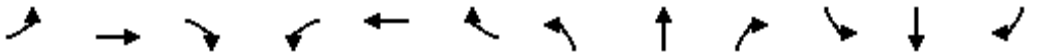
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	287	-	-	204	-
HCM Lane V/C Ratio	0.114	-	-	0.027	-
HCM Control Delay (s)	19.1	-	-	23.1	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1020	425	300	705	0	0	0	0	280	0	445
Future Volume (vph)	0	1020	425	300	705	0	0	0	0	280	0	445
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6346	1533	1577	3505						1752	1568
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6346	1533	1577	3505						1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1085	452	319	750	0	0	0	0	298	0	473
RTOR Reduction (vph)	0	0	305	0	0	0	0	0	0	0	0	220
Lane Group Flow (vph)	0	1085	147	319	750	0	0	0	0	0	298	253
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		23.1	23.1	18.4	45.7						15.6	15.6
Effective Green, g (s)		23.1	23.1	18.4	45.7						15.6	15.6
Actuated g/C Ratio		0.33	0.33	0.26	0.64						0.22	0.22
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2064	498	408	2256						384	344
v/s Ratio Prot		c0.17		c0.20	0.21						c0.17	
v/s Ratio Perm			0.10									0.16
v/c Ratio		0.53	0.30	0.78	0.33						0.78	0.74
Uniform Delay, d1		19.5	17.9	24.4	5.7						26.1	25.8
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.5	8.7	0.1						9.1	7.5
Delay (s)		19.8	18.3	33.1	5.9						35.2	33.3
Level of Service		B	B	C	A						D	C
Approach Delay (s)		19.4			14.0			0.0			34.0	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	490	815	0	0	765	285	240	5	250	0	0	0
Future Volume (vph)	490	815	0	0	765	285	240	5	250	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1758	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1758	1568			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	516	858	0	0	805	300	253	5	263	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	122	0	0	139	0	0	0
Lane Group Flow (vph)	516	858	0	0	805	178	0	258	124	0	0	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	19.2	61.4			38.0	38.0		18.9	18.9			
Effective Green, g (s)	19.2	61.4			38.0	38.0		18.9	18.9			
Actuated g/C Ratio	0.21	0.68			0.42	0.42		0.21	0.21			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	652	2391			1479	662		369	329			
v/s Ratio Prot	c0.17	0.24			c0.23			c0.15				
v/s Ratio Perm						0.11			0.08			
v/c Ratio	0.79	0.36			0.54	0.27		0.70	0.38			
Uniform Delay, d1	33.5	6.0			19.5	16.9		32.9	30.5			
Progression Factor	1.00	1.00			1.22	1.77		1.00	1.00			
Incremental Delay, d2	6.1	0.4			1.2	0.8		5.8	0.8			
Delay (s)	39.6	6.4			25.1	30.8		38.7	31.3			
Level of Service	D	A			C	C		D	C			
Approach Delay (s)		18.9			26.6			35.0			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	385	590	80	35	460	130	125	10	25	145	15
Future Volume (vph)	15	385	590	80	35	460	130	125	10	25	145	15
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3060	3505	1568	1577	3378			1763	1534		1765
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3060	3505	1568	1577	3378			1763	1534		1765
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	410	628	85	37	489	138	133	11	27	154	16
RTOR Reduction (vph)	0	0	0	42	0	20	0	0	0	23	0	0
Lane Group Flow (vph)	0	426	628	43	37	607	0	0	144	4	0	170
Confl. Peds. (#/hr)							3			9		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		15.1	45.9	45.9	3.4	33.3			12.1	12.1		11.4
Effective Green, g (s)		15.1	45.9	45.9	3.4	33.3			12.1	12.1		11.4
Actuated g/C Ratio		0.17	0.51	0.51	0.04	0.37			0.13	0.13		0.13
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		513	1787	799	59	1249			237	206		223
v/s Ratio Prot		c0.14	0.18		0.02	c0.18			c0.08			c0.10
v/s Ratio Perm				0.03						0.00		
v/c Ratio		0.83	0.35	0.05	0.63	0.49			0.61	0.02		0.76
Uniform Delay, d1		36.2	13.2	11.1	42.7	21.8			36.7	33.8		38.0
Progression Factor		0.91	1.15	2.30	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		9.9	0.5	0.1	14.0	1.4			3.0	0.0		12.9
Delay (s)		42.9	15.6	25.7	56.7	23.1			39.7	33.8		50.9
Level of Service		D	B	C	E	C			D	C		D
Approach Delay (s)			26.6			25.0			38.8			39.9
Approach LOS			C			C			D			D

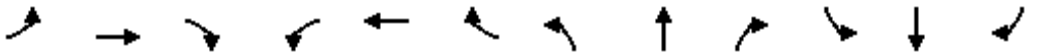
Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	465
Future Volume (vph)	465
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	495
RTOR Reduction (vph)	432
Lane Group Flow (vph)	63
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	11.4
Effective Green, g (s)	11.4
Actuated g/C Ratio	0.13
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	198
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.32
Uniform Delay, d1	35.8
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	36.1
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	650	5	5	520	30	10	5	5	25	0	95
Future Volume (Veh/h)	105	650	5	5	520	30	10	5	5	25	0	95
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	111	684	5	5	547	32	11	5	5	26	0	100
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	579			689			1292	1498	688	1490	1484	290
vC1, stage 1 conf vol							908	908		573	573	
vC2, stage 2 conf vol							384	589		917	911	
vCu, unblocked vol	579			541			1254	1497	540	1488	1481	290
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			99			95	98	99	88	100	86
cM capacity (veh/h)	984			860			224	242	409	214	256	704

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	800	278	306	21	26	100
Volume Left	111	5	0	11	26	0
Volume Right	5	0	32	5	0	100
cSH	984	860	1700	256	214	704
Volume to Capacity	0.11	0.01	0.18	0.08	0.12	0.14
Queue Length 95th (ft)	10	0	0	7	10	12
Control Delay (s)	2.8	0.2	0.0	20.3	24.1	11.0
Lane LOS	A	A		C	C	B
Approach Delay (s)	2.8	0.1		20.3	13.7	
Approach LOS				C	B	

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	73.8%	ICU Level of Service		D
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	590	25	5	485	60	10
Future Vol, veh/h	590	25	5	485	60	10
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	621	26	5	511	63	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	648	0	1156	635
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	521	-
Critical Hdwy	-	-	4.14	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.236	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	928	-	215	475
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	928	-	213	475
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	587	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	27.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	231	-	-	928	-
HCM Lane V/C Ratio	0.319	-	-	0.006	-
HCM Control Delay (s)	27.7	-	-	8.9	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	580	10	5	485	5	5	0	5	5	0	5
Future Vol, veh/h	15	580	10	5	485	5	5	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	611	11	5	511	5	5	0	5	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	516	0	0	621	0	0	1173	1173	616	1174	1177	513
Stage 1	-	-	-	-	-	-	647	647	-	524	524	-
Stage 2	-	-	-	-	-	-	526	526	-	650	653	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1050	-	-	960	-	-	169	192	491	169	191	561
Stage 1	-	-	-	-	-	-	460	467	-	537	530	-
Stage 2	-	-	-	-	-	-	535	529	-	458	464	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1050	-	-	960	-	-	164	186	491	163	185	561
Mov Cap-2 Maneuver	-	-	-	-	-	-	164	186	-	163	185	-
Stage 1	-	-	-	-	-	-	449	456	-	525	526	-
Stage 2	-	-	-	-	-	-	526	525	-	443	453	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	20.3	19.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	246	1050	-	-	960	-	-	253
HCM Lane V/C Ratio	0.043	0.015	-	-	0.005	-	-	0.042
HCM Control Delay (s)	20.3	8.5	0	-	8.8	0	-	19.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	185	400	350	60	75	145
Future Vol, veh/h	185	400	350	60	75	145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	206	444	389	67	83	161

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	456	0	-	0	1278	422
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	856	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1105	-	-	-	183	632
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	416	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1105	-	-	-	149	632
Mov Cap-2 Maneuver	-	-	-	-	149	-
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	338	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	53.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1105	-	-	-	300
HCM Lane V/C Ratio	0.186	-	-	-	0.815
HCM Control Delay (s)	9	-	-	-	53.7
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.7	-	-	-	6.7

Intersection	
Int Delay, s/veh	9.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	335	160	125	45	40	265
Future Vol, veh/h	335	160	125	45	40	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	385	184	144	52	46	305

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	195	0	-	0	1124	170
Stage 1	-	-	-	-	170	-
Stage 2	-	-	-	-	954	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1378	-	-	-	227	874
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	374	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1378	-	-	-	164	874
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	270	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	21.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1378	-	-	-	557
HCM Lane V/C Ratio	0.279	-	-	-	0.629
HCM Control Delay (s)	8.6	-	-	-	21.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	1.2	-	-	-	4.4

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	295	290	25	20	35
Future Vol, veh/h	45	295	290	25	20	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	304	299	26	21	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	325	0	-	0	709	312
Stage 1	-	-	-	-	312	-
Stage 2	-	-	-	-	397	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1235	-	-	-	401	728
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	679	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1235	-	-	-	383	728
Mov Cap-2 Maneuver	-	-	-	-	383	-
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1235	-	-	-	548
HCM Lane V/C Ratio	0.038	-	-	-	0.103
HCM Control Delay (s)	8	0	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

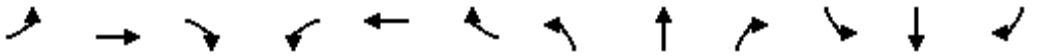
Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	100	180	240	55	45	80
Future Vol, veh/h	100	180	240	55	45	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	104	188	250	57	47	83

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	250	0	-	0	646	250
Stage 1	-	-	-	-	250	-
Stage 2	-	-	-	-	396	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1316	-	-	-	436	789
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	680	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1316	-	-	-	402	789
Mov Cap-2 Maneuver	-	-	-	-	402	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	626	-

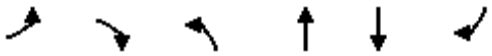
Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1316	-	-	-	586
HCM Lane V/C Ratio	0.079	-	-	-	0.222
HCM Control Delay (s)	8	-	-	-	12.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.8



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	5	65	15	15	20	140	400	15	15	420	165
Future Volume (vph)	115	5	65	15	15	20	140	400	15	15	420	165
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1604		1593	1702		1593	1853		1593	1863	1550
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1604		1593	1702		1593	1853		1593	1863	1550
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	134	6	76	17	17	23	163	465	17	17	488	192
RTOR Reduction (vph)	0	65	0	0	22	0	0	1	0	0	0	114
Lane Group Flow (vph)	134	17	0	17	18	0	163	481	0	17	488	78
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	6.7	9.1		0.8	3.2		7.8	31.6		0.8	24.6	24.6
Effective Green, g (s)	6.7	9.1		0.8	3.2		7.8	31.6		0.8	24.6	24.6
Actuated g/C Ratio	0.11	0.15		0.01	0.05		0.13	0.52		0.01	0.41	0.41
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	177	242		21	90		206	971		21	760	632
v/s Ratio Prot	c0.08	0.01		0.01	c0.01		c0.10	0.26		0.01	c0.26	
v/s Ratio Perm												0.05
v/c Ratio	0.76	0.07		0.81	0.20		0.79	0.50		0.81	0.64	0.12
Uniform Delay, d1	26.0	22.0		29.7	27.3		25.5	9.2		29.7	14.3	11.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.8	0.1		109.0	1.1		18.4	0.4		109.0	1.9	0.1
Delay (s)	42.8	22.1		138.7	28.4		43.9	9.6		138.7	16.2	11.2
Level of Service	D	C		F	C		D	A		F	B	B
Approach Delay (s)		34.9			61.3			18.3			17.8	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	50	60	15	290	490	15
Future Volume (vph)	50	60	15	290	490	15
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3521	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3521	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	57	69	17	333	563	17
RTOR Reduction (vph)	0	60	0	0	1	0
Lane Group Flow (vph)	57	9	17	333	579	0
Confl. Peds. (#/hr)						1
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	5.0	5.0	1.0	26.2	21.7	
Effective Green, g (s)	5.0	5.0	1.0	26.2	21.7	
Actuated g/C Ratio	0.12	0.12	0.02	0.65	0.54	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	199	197	39	1220	1910	
v/s Ratio Prot	c0.04		0.01	c0.18	0.16	
v/s Ratio Perm		0.01				
v/c Ratio	0.29	0.04	0.44	0.27	0.30	
Uniform Delay, d1	15.9	15.4	19.2	2.9	5.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.0	2.8	0.2	0.2	
Delay (s)	16.2	15.4	22.0	3.1	5.2	
Level of Service	B	B	C	A	A	
Approach Delay (s)	15.8			4.1	5.2	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	12.3
Intersection Capacity Utilization	26.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	10	320	15	5	480
Future Vol, veh/h	15	10	320	15	5	480
Conflicting Peds, #/hr	0	1	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	12	395	19	6	593

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1010	406	0	0	415	0
Stage 1	405	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	266	645	-	-	1144	-
Stage 1	673	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	264	644	-	-	1143	-
Mov Cap-2 Maneuver	392	-	-	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	541	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	465	1143	-
HCM Lane V/C Ratio	-	-	0.066	0.005	-
HCM Control Delay (s)	-	-	13.3	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	30	320	20	45	490
Future Vol, veh/h	15	30	320	20	45	490
Conflicting Peds, #/hr	0	2	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	35	376	24	53	576

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1072	392	0	0	402	0
Stage 1	390	-	-	-	-	-
Stage 2	682	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	244	657	-	-	1157	-
Stage 1	684	-	-	-	-	-
Stage 2	502	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	227	654	-	-	1155	-
Mov Cap-2 Maneuver	351	-	-	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	468	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	508	1155	-
HCM Lane V/C Ratio	-	-	0.104	0.046	-
HCM Control Delay (s)	-	-	12.9	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

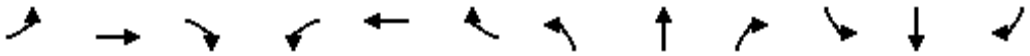
Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	5	55	5	35	5	320	35	75	525	20
Future Vol, veh/h	10	5	5	55	5	35	5	320	35	75	525	20
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	6	6	64	6	41	6	372	41	87	610	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1228	1225	626	1210	1216	396	636	0	0	415	0	0
Stage 1	799	799	-	406	406	-	-	-	-	-	-	-
Stage 2	429	426	-	804	810	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	155	179	484	159	181	653	947	-	-	1144	-	-
Stage 1	379	398	-	622	598	-	-	-	-	-	-	-
Stage 2	604	586	-	377	393	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	127	156	482	138	158	651	945	-	-	1142	-	-
Mov Cap-2 Maneuver	127	156	-	138	158	-	-	-	-	-	-	-
Stage 1	375	350	-	616	592	-	-	-	-	-	-	-
Stage 2	555	580	-	322	346	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.4	44.8	0.1	1
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	945	-	-	165	196	1142	-	-
HCM Lane V/C Ratio	0.006	-	-	0.141	0.564	0.076	-	-
HCM Control Delay (s)	8.8	0	-	30.4	44.8	8.4	0	-
HCM Lane LOS	A	A	-	D	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	3	0.2	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	370	270	245	300	110	135	260	170	160	275	45
Future Volume (vph)	45	370	270	245	300	110	135	260	170	160	275	45
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1540	1593	3539	1563	1593	3310		1593	3457	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1540	1593	3539	1563	1593	3310		1593	3457	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	411	300	272	333	122	150	289	189	178	306	50
RTOR Reduction (vph)	0	0	230	0	0	75	0	108	0	0	13	0
Lane Group Flow (vph)	50	411	70	272	333	47	150	370	0	178	343	0
Confl. Peds. (#/hr)			3						2			2
Confl. Bikes (#/hr)			2			2			1			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.8	20.2	20.2	18.0	33.4	33.4	12.8	17.6		13.9	18.7	
Effective Green, g (s)	4.8	20.2	20.2	18.0	33.4	33.4	12.8	17.6		13.9	18.7	
Actuated g/C Ratio	0.06	0.23	0.23	0.21	0.39	0.39	0.15	0.20		0.16	0.22	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	88	824	358	330	1363	602	235	671		255	745	
v/s Ratio Prot	0.03	c0.12		c0.17	0.09		0.09	c0.11		c0.11	0.10	
v/s Ratio Perm			0.05			0.03						
v/c Ratio	0.57	0.50	0.20	0.82	0.24	0.08	0.64	0.55		0.70	0.46	
Uniform Delay, d1	39.9	28.9	26.7	32.8	18.1	16.9	34.8	31.0		34.4	29.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	1.0	0.6	14.6	0.2	0.1	4.1	1.7		6.6	0.9	
Delay (s)	44.9	29.9	27.3	47.4	18.3	17.0	38.9	32.7		41.0	30.6	
Level of Service	D	C	C	D	B	B	D	C		D	C	
Approach Delay (s)		29.8			29.0			34.2			34.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	45	30	15	190	30	50	5	90	400	165	40	505
Future Volume (vph)	45	30	15	190	30	50	5	90	400	165	40	505
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frt	1.00	0.95		1.00	0.91			1.00	0.96		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1593	1772		1593	1689			1593	3384		1593	3496
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1593	1772		1593	1689			1593	3384		1593	3496
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	33	16	207	33	54	5	98	435	179	43	549
RTOR Reduction (vph)	0	15	0	0	42	0	0	0	38	0	0	6
Lane Group Flow (vph)	49	34	0	207	45	0	0	103	576	0	43	592
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	4.3	3.9		15.2	14.8			7.8	23.3		4.2	19.7
Effective Green, g (s)	4.3	3.9		15.2	14.8			7.8	23.3		4.2	19.7
Actuated g/C Ratio	0.07	0.06		0.24	0.23			0.12	0.36		0.07	0.30
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	106	106		374	386			192	1220		103	1066
v/s Ratio Prot	0.03	c0.02		c0.13	0.03			c0.06	c0.17		0.03	c0.17
v/s Ratio Perm												
v/c Ratio	0.46	0.32		0.55	0.12			0.54	0.47		0.42	0.56
Uniform Delay, d1	29.0	29.1		21.7	19.7			26.7	15.9		29.0	18.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	1.8		1.8	0.1			2.9	0.3		2.7	0.6
Delay (s)	32.2	30.8		23.5	19.9			29.6	16.2		31.8	19.4
Level of Service	C	C		C	B			C	B		C	B
Approach Delay (s)		31.5			22.4				18.1			20.2
Approach LOS		C			C				B			C

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	64.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	49
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

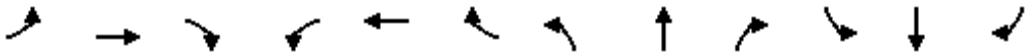
Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	25	400	10	55	500
Future Vol, veh/h	10	25	400	10	55	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	27	440	11	60	549

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	841	225	0	0	451	0
Stage 1	445	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	304	778	-	-	1106	-
Stage 1	613	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	280	778	-	-	1106	-
Mov Cap-2 Maneuver	404	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	598	-	-	-	-	-

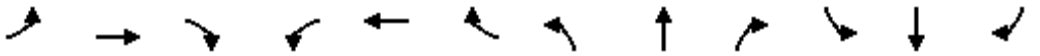
Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	615	1106	-
HCM Lane V/C Ratio	-	-	0.063	0.055	-
HCM Control Delay (s)	-	-	11.2	8.4	0.3
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	10	65	5	10	20	40	375	15	25	515	90
Future Volume (vph)	75	10	65	5	10	20	40	375	15	25	515	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.92		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1685			1671		1577	3482		1577	3414	
Flt Permitted		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1685			1671		1577	3482		1577	3414	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	81	11	70	5	11	22	43	403	16	27	554	97
RTOR Reduction (vph)	0	30	0	0	21	0	0	3	0	0	13	0
Lane Group Flow (vph)	0	132	0	0	17	0	43	416	0	27	638	0
Confl. Peds. (#/hr)			1						1			4
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		11.0			1.9		2.3	23.4		2.0	23.1	
Effective Green, g (s)		11.0			1.9		2.3	23.4		2.0	23.1	
Actuated g/C Ratio		0.20			0.03		0.04	0.43		0.04	0.42	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		338			57		66	1486		57	1439	
v/s Ratio Prot		c0.08			c0.01		c0.03	0.12		0.02	c0.19	
v/s Ratio Perm												
v/c Ratio		0.39			0.29		0.65	0.28		0.47	0.44	
Uniform Delay, d1		19.0			25.8		25.9	10.2		25.9	11.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			1.0		16.2	0.2		2.3	0.4	
Delay (s)		19.3			26.8		42.0	10.4		28.1	11.7	
Level of Service		B			C		D	B		C	B	
Approach Delay (s)		19.3			26.8			13.4			12.4	
Approach LOS		B			C			B			B	

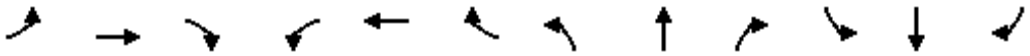
Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	54.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	25	15	0	5	25	615	5	25	700	35
Future Volume (vph)	30	0	25	15	0	5	25	615	5	25	700	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1690			1737		1593	3534		1593	3510	
Flt Permitted		0.82			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1423			1803		1593	3534		1593	3510	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	32	0	27	16	0	5	27	654	5	27	745	37
RTOR Reduction (vph)	0	53	0	0	21	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	6	0	0	0	0	27	659	0	27	780	0
Confl. Peds. (#/hr)			4						4			6
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		5.0			0.5		0.9	30.2		0.9	30.2	
Effective Green, g (s)		5.0			0.5		0.9	30.2		0.9	30.2	
Actuated g/C Ratio		0.09			0.01		0.02	0.57		0.02	0.57	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		133			16		27	2009		27	1996	
v/s Ratio Prot							c0.02	0.19		0.02	c0.22	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.04			0.01		1.00	0.33		1.00	0.39	
Uniform Delay, d1		21.9			26.1		26.1	6.1		26.1	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.1		173.2	0.3		173.2	0.4	
Delay (s)		21.9			26.2		199.3	6.4		199.3	6.8	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		21.9			26.2			14.0			13.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	455	105	225	395	270	105	400	180	355	550	145
Future Volume (vph)	170	455	105	225	395	270	105	400	180	355	550	145
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1543	1593	3539	1544	1593	3343		1593	3406	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1543	1593	3539	1544	1593	3343		1593	3406	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	479	111	237	416	284	111	421	189	374	579	153
RTOR Reduction (vph)	0	0	76	0	0	197	0	36	0	0	16	0
Lane Group Flow (vph)	179	479	35	237	416	87	111	574	0	374	716	0
Confl. Peds. (#/hr)			11			10			14			15
Confl. Bikes (#/hr)			2			3			2			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	11.6	25.4	25.4	22.1	35.9	35.9	12.3	27.1		27.0	41.5	
Effective Green, g (s)	11.6	25.4	25.4	22.1	35.9	35.9	12.3	27.1		27.0	41.5	
Actuated g/C Ratio	0.10	0.22	0.22	0.19	0.30	0.30	0.10	0.23		0.23	0.35	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	304	763	332	298	1078	470	166	769		365	1199	
v/s Ratio Prot	0.06	c0.14		c0.15	0.12		0.07	c0.17		c0.23	0.21	
v/s Ratio Perm			0.02			0.06						
v/c Ratio	0.59	0.63	0.11	0.80	0.39	0.18	0.67	0.75		1.02	0.60	
Uniform Delay, d1	50.8	41.9	37.1	45.7	32.3	30.2	50.8	42.2		45.4	31.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	2.3	0.3	12.8	0.5	0.4	7.7	4.8		53.6	1.2	
Delay (s)	52.7	44.2	37.4	58.5	32.7	30.6	58.4	46.9		99.0	32.5	
Level of Service	D	D	D	E	C	C	E	D		F	C	
Approach Delay (s)		45.2			38.6			48.7			55.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	117.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	5	40	70	315	55	145	5	45	370	330	5
Future Volume (vph)	5	5	40	70	315	55	145	5	45	370	330	5
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710
Total Lost time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.93	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1593	3539	1562	3090	1644	1504		1593	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1593	3539	1562	3090	1644	1504		1593	3539	1583	
Peak-hour factor, PHF	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.97	0.97	0.97	0.92
Adj. Flow (vph)	5	5	41	72	325	57	149	5	46	381	340	5
RTOR Reduction (vph)	0	0	0	61	0	24	74	0	0	0	180	0
Lane Group Flow (vph)	0	10	41	11	325	84	24	0	51	381	160	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)				1								
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot
Protected Phases	8	8	8		7	7		1	1	6	7	5
Permitted Phases				8			7				6	
Actuated Green, G (s)		14.2	14.2	14.2	22.3	22.3	22.3		6.5	20.6	42.9	
Effective Green, g (s)		14.2	14.2	14.2	22.3	22.3	22.3		6.5	20.6	42.9	
Actuated g/C Ratio		0.16	0.16	0.16	0.25	0.25	0.25		0.07	0.23	0.47	
Clearance Time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	
Lane Grp Cap (vph)		248	552	243	757	402	368		113	801	746	
v/s Ratio Prot		0.01	c0.01		c0.11	0.05			0.03	c0.11	0.05	
v/s Ratio Perm				0.01			0.02				0.05	
v/c Ratio		0.04	0.07	0.05	0.43	0.21	0.07		0.45	0.48	0.21	
Uniform Delay, d1		32.6	32.8	32.6	29.0	27.3	26.4		40.5	30.5	14.1	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.1	0.1	0.4	0.3	0.1		2.8	0.9	0.1	
Delay (s)		32.7	32.8	32.7	29.4	27.6	26.4		43.4	31.5	14.3	
Level of Service		C	C	C	C	C	C		D	C	B	
Approach Delay (s)			32.8			28.5				24.7		
Approach LOS			C			C				C		

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	20.1
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	175	395	10
Future Volume (vph)	175	395	10
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.1	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3090	3539	1538
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3090	3539	1538
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	180	407	10
RTOR Reduction (vph)	0	0	7
Lane Group Flow (vph)	185	407	3
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	13.8	27.9	27.9
Effective Green, g (s)	13.8	27.9	27.9
Actuated g/C Ratio	0.15	0.31	0.31
Clearance Time (s)	4.1	6.5	6.5
Vehicle Extension (s)	3.0	5.0	5.0
Lane Grp Cap (vph)	468	1085	471
v/s Ratio Prot	c0.06	0.11	
v/s Ratio Perm			0.00
v/c Ratio	0.40	0.38	0.01
Uniform Delay, d1	34.8	24.7	21.9
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0
Delay (s)	35.4	25.2	21.9
Level of Service	D	C	C
Approach Delay (s)		28.3	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	20	30	435	55	5	230	450	45	5	80	30	280
Future Volume (vph)	20	30	435	55	5	230	450	45	5	80	30	280
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1710	1900	1900
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00		1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	3505	1568		1577	3505	1568		1578	1845	1568
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1583	3505	1568		1577	3505	1568		1578	1845	1568
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Adj. Flow (vph)	22	33	478	60	5	253	495	49	5	88	33	308
RTOR Reduction (vph)	0	0	0	41	0	0	0	26	0	0	0	268
Lane Group Flow (vph)	0	55	478	19	0	258	495	23	0	93	33	40
Heavy Vehicles (%)	2%	3%	3%	3%	2%	3%	3%	3%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	Split	NA	Perm
Protected Phases	5	5	2		1	1	6		3	3	3	
Permitted Phases				2				6				3
Actuated Green, G (s)		6.1	24.3	24.3		17.9	36.1	36.1		9.8	9.8	9.8
Effective Green, g (s)		6.1	24.3	24.3		17.9	36.1	36.1		9.8	9.8	9.8
Actuated g/C Ratio		0.08	0.32	0.32		0.24	0.48	0.48		0.13	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0		2.0	2.0	2.0
Lane Grp Cap (vph)		128	1129	505		374	1678	750		205	239	203
v/s Ratio Prot		0.03	c0.14			c0.16	0.14			c0.06	0.02	
v/s Ratio Perm				0.01				0.01				0.03
v/c Ratio		0.43	0.42	0.04		0.69	0.29	0.03		0.45	0.14	0.20
Uniform Delay, d1		33.0	20.1	17.5		26.2	11.9	10.4		30.3	29.1	29.3
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.8	1.1	0.1		4.2	0.4	0.1		0.6	0.1	0.2
Delay (s)		33.8	21.1	17.7		30.4	12.3	10.5		30.9	29.2	29.5
Level of Service		C	C	B		C	B	B		C	C	C
Approach Delay (s)			22.0				18.0				29.7	
Approach LOS			C				B				C	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	17.5
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

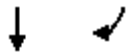


Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	45	35	20
Future Volume (vph)	45	35	20
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.5	4.5	
Lane Util. Factor	1.00	1.00	
Frt	1.00	0.94	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1577	1743	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1577	1743	
Peak-hour factor, PHF	0.91	0.91	0.91
Adj. Flow (vph)	49	38	22
RTOR Reduction (vph)	0	17	0
Lane Group Flow (vph)	49	43	0
Heavy Vehicles (%)	3%	3%	3%
Turn Type	Split	NA	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)	5.9	5.9	
Effective Green, g (s)	5.9	5.9	
Actuated g/C Ratio	0.08	0.08	
Clearance Time (s)	4.5	4.5	
Vehicle Extension (s)	2.0	2.0	
Lane Grp Cap (vph)	123	136	
v/s Ratio Prot	c0.03	0.02	
v/s Ratio Perm			
v/c Ratio	0.40	0.32	
Uniform Delay, d1	33.1	32.9	
Progression Factor	1.00	1.00	
Incremental Delay, d2	0.8	0.5	
Delay (s)	33.8	33.3	
Level of Service	C	C	
Approach Delay (s)		33.6	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	55	705	0	5	5	665	150	5	5	0	145
Future Volume (vph)	5	55	705	0	5	5	665	150	5	5	0	145
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		1.00		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (prot)		1593	3539			1593	3539	1550		1817		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (perm)		1593	3539			1593	3539	1550		1817		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	57	734	0	5	5	693	156	5	5	0	151
RTOR Reduction (vph)	0	0	0	0	0	0	0	89	0	0	0	0
Lane Group Flow (vph)	0	62	734	0	0	10	693	67	0	10	0	0
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.4	31.3			0.8	27.3	27.3		0.8		
Effective Green, g (s)		4.4	31.3			0.8	27.3	27.3		0.8		
Actuated g/C Ratio		0.07	0.49			0.01	0.43	0.43		0.01		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		110	1747			20	1523	667		22		
v/s Ratio Prot		c0.04	c0.21			0.01	0.20			c0.01		
v/s Ratio Perm								0.04				
v/c Ratio		0.56	0.42			0.50	0.46	0.10		0.45		
Uniform Delay, d1		28.6	10.3			31.1	12.8	10.7		31.1		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		3.9	0.7			7.0	0.8	0.3		5.3		
Delay (s)		32.5	10.9			38.1	13.6	11.0		36.4		
Level of Service		C	B			D	B	B		D		
Approach Delay (s)			12.6				13.4			36.4		
Approach LOS			B				B			D		

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	63.4	Sum of lost time (s)	18.2
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

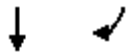


Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	55
Future Volume (vph)	10	55
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.96	
Flt Protected	0.97	
Satd. Flow (prot)	1737	
Flt Permitted	0.97	
Satd. Flow (perm)	1737	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	10	57
RTOR Reduction (vph)	10	0
Lane Group Flow (vph)	208	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	12.7	
Effective Green, g (s)	12.7	
Actuated g/C Ratio	0.20	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	347	
v/s Ratio Prot	c0.12	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	23.0	
Progression Factor	1.00	
Incremental Delay, d2	1.9	
Delay (s)	24.9	
Level of Service	C	
Approach Delay (s)	24.9	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	15	825	15	5	20	760	30	10	0	15	30
Future Volume (vph)	5	15	825	15	5	20	760	30	10	0	15	30
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1593	3530			1593	3516			1676		
Flt Permitted		0.95	1.00			0.95	1.00			1.00		
Satd. Flow (perm)		1593	3530			1593	3516			1708		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	16	859	16	5	21	792	31	10	0	16	31
RTOR Reduction (vph)	0	0	1	0	0	0	2	0	0	25	0	0
Lane Group Flow (vph)	0	21	874	0	0	26	821	0	0	1	0	0
Confl. Bikes (#/hr)								2				
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		1.1	33.3			1.1	33.3			2.7		
Effective Green, g (s)		1.1	33.3			1.1	33.3			2.7		
Actuated g/C Ratio		0.02	0.66			0.02	0.66			0.05		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		34	2313			34	2304			90		
v/s Ratio Prot		0.01	c0.25			c0.02	0.23					
v/s Ratio Perm										0.00		
v/c Ratio		0.62	0.38			0.76	0.36			0.02		
Uniform Delay, d1		24.6	4.0			24.7	3.9			22.8		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		21.2	0.4			61.1	0.4			0.0		
Delay (s)		45.8	4.4			85.8	4.3			22.8		
Level of Service		D	A			F	A			C		
Approach Delay (s)			5.4				6.8			22.8		
Approach LOS			A				A			C		

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	13.7
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	35
Future Volume (vph)	0	35
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.93	
Flt Protected	0.98	
Satd. Flow (prot)	1689	
Flt Permitted	1.00	
Satd. Flow (perm)	1728	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	0	36
RTOR Reduction (vph)	63	0
Lane Group Flow (vph)	4	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	2.7	
Effective Green, g (s)	2.7	
Actuated g/C Ratio	0.05	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	91	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.04	
Uniform Delay, d1	22.8	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	22.9	
Level of Service	C	
Approach Delay (s)	22.9	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	95	710	10	5	10	660	85	10	15	15	5	120
Future Volume (vph)	95	710	10	5	10	660	85	10	15	15	5	120
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1710
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00		0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (prot)	1593	3531			1593	3539	1564		1828	1583		1513
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (perm)	1593	3531			1593	3539	1564		1828	1583		1513
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	99	740	10	5	10	688	89	10	16	16	5	125
RTOR Reduction (vph)	0	0	0	0	0	0	37	0	0	15	0	0
Lane Group Flow (vph)	99	750	0	0	15	688	52	0	26	1	0	72
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			1				1					
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	Split
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	8.5	60.6			1.1	52.2	52.2		3.0	3.0		8.6
Effective Green, g (s)	8.5	60.6			1.1	52.2	52.2		3.0	3.0		8.6
Actuated g/C Ratio	0.09	0.67			0.01	0.58	0.58		0.03	0.03		0.10
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2		0.2
Lane Grp Cap (vph)	150	2377			19	2052	907		60	52		144
v/s Ratio Prot	c0.06	0.21			0.01	c0.19			c0.01			c0.05
v/s Ratio Perm							0.03			0.00		
v/c Ratio	0.66	0.32			0.79	0.34	0.06		0.43	0.01		0.50
Uniform Delay, d1	39.4	6.1			44.3	9.9	8.2		42.7	42.1		38.7
Progression Factor	1.00	1.00			1.33	0.62	0.47		1.00	1.00		1.00
Incremental Delay, d2	8.1	0.3			99.3	0.4	0.1		1.8	0.0		1.0
Delay (s)	47.5	6.4			158.2	6.6	4.0		44.5	42.1		39.7
Level of Service	D	A			F	A	A		D	D		D
Approach Delay (s)		11.2				9.1			43.6			
Approach LOS		B				A			D			

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	15	130
Future Volume (vph)	15	130
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.4	4.4
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.96	1.00
Satd. Flow (prot)	1703	1557
Flt Permitted	0.96	1.00
Satd. Flow (perm)	1703	1557
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	16	135
RTOR Reduction (vph)	0	122
Lane Group Flow (vph)	74	13
Confl. Peds. (#/hr)		2
Confl. Bikes (#/hr)		1
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	8.6	8.6
Effective Green, g (s)	8.6	8.6
Actuated g/C Ratio	0.10	0.10
Clearance Time (s)	4.4	4.4
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	162	148
v/s Ratio Prot	0.04	
v/s Ratio Perm		0.01
v/c Ratio	0.46	0.09
Uniform Delay, d1	38.5	37.1
Progression Factor	1.00	1.00
Incremental Delay, d2	0.7	0.1
Delay (s)	39.2	37.2
Level of Service	D	D
Approach Delay (s)	38.4	
Approach LOS	D	

Intersection Summary

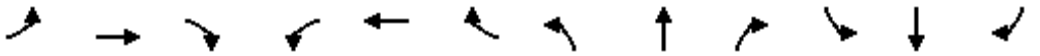
Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	825	0	5	35	785	0	35
Future Vol, veh/h	825	0	5	35	785	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	842	0	5	36	801	0	36

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	614	842	0	-	421
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	5.64	5.34	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.32	3.12	-	-	3.92
Pot Cap-1 Maneuver	-	-	718	466	-	0	497
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	484	484	-	-	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-

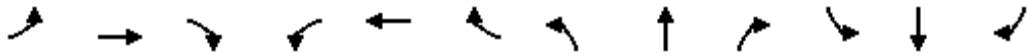
Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	497	-	-	484	-
HCM Lane V/C Ratio	0.072	-	-	0.084	-
HCM Control Delay (s)	12.8	-	-	13.1	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-



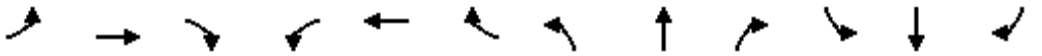
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	695	180	195	505	0	0	0	0	165	0	325
Future Volume (vph)	0	695	180	195	505	0	0	0	0	165	0	325
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6408	1549	1593	3539						1770	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6408	1549	1593	3539						1770	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	709	184	199	515	0	0	0	0	168	0	332
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	0	0	0	281
Lane Group Flow (vph)	0	709	96	199	515	0	0	0	0	0	168	51
Confl. Peds. (#/hr)			1									
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		46.8	46.8	15.5	66.5						13.8	13.8
Effective Green, g (s)		46.8	46.8	15.5	66.5						13.8	13.8
Actuated g/C Ratio		0.52	0.52	0.17	0.74						0.15	0.15
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		3332	805	274	2614						271	242
v/s Ratio Prot		c0.11		c0.12	0.15						c0.09	
v/s Ratio Perm			0.06									0.03
v/c Ratio		0.21	0.12	0.73	0.20						0.62	0.21
Uniform Delay, d1		11.7	11.1	35.2	3.6						35.6	33.3
Progression Factor		0.73	0.37	0.94	2.15						1.00	1.00
Incremental Delay, d2		0.1	0.3	7.6	0.2						3.6	0.3
Delay (s)		8.6	4.4	40.6	7.9						39.2	33.6
Level of Service		A	A	D	A						D	C
Approach Delay (s)		7.7			17.0			0.0			35.5	
Approach LOS		A			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	490	0	0	545	225	165	0	205	0	0	0
Future Volume (vph)	380	490	0	0	545	225	165	0	205	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3090	3539			3539	1563		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3090	3539			3539	1563		1770	1583			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	396	510	0	0	568	234	172	0	214	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	115	0	0	179	0	0	0
Lane Group Flow (vph)	396	510	0	0	568	119	0	172	35	0	0	0
Confl. Peds. (#/hr)			3			1						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	15.5	65.6			45.9	45.9		14.7	14.7			
Effective Green, g (s)	15.5	65.6			45.9	45.9		14.7	14.7			
Actuated g/C Ratio	0.17	0.73			0.51	0.51		0.16	0.16			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	532	2579			1804	797		289	258			
v/s Ratio Prot	c0.13	0.14			c0.16			c0.10				
v/s Ratio Perm						0.08			0.02			
v/c Ratio	0.74	0.20			0.31	0.15		0.60	0.14			
Uniform Delay, d1	35.4	3.9			12.9	11.7		34.9	32.2			
Progression Factor	0.75	1.27			1.38	3.45		1.00	1.00			
Incremental Delay, d2	4.8	0.2			0.4	0.4		3.4	0.3			
Delay (s)	31.3	5.1			18.1	40.7		38.2	32.5			
Level of Service	C	A			B	D		D	C			
Approach Delay (s)		16.5			24.7			35.0			0.0	
Approach LOS		B			C			D			A	

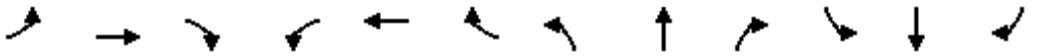
Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	355	30	35	370	95	55	30	15	90	60	310
Future Volume (vph)	290	355	30	35	370	95	55	30	15	90	60	310
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	3090	3539	1548	1593	3421			1804	1563		1808	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (perm)	3090	3539	1548	1593	3421			1804	1563		1808	1561
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	309	378	32	37	394	101	59	32	16	96	64	330
RTOR Reduction (vph)	0	0	14	0	16	0	0	0	14	0	0	291
Lane Group Flow (vph)	309	378	18	37	479	0	0	91	2	0	160	39
Confl. Peds. (#/hr)			1			1			1			
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2						3			4
Actuated Green, G (s)	11.7	49.3	49.3	3.6	40.3			9.3	9.3		10.6	10.6
Effective Green, g (s)	11.7	49.3	49.3	3.6	40.3			9.3	9.3		10.6	10.6
Actuated g/C Ratio	0.13	0.55	0.55	0.04	0.45			0.10	0.10		0.12	0.12
Clearance Time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Vehicle Extension (s)	0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	401	1938	847	63	1531			186	161		212	183
v/s Ratio Prot	c0.10	0.11		0.02	c0.14			c0.05			c0.09	
v/s Ratio Perm			0.01						0.00			0.02
v/c Ratio	0.77	0.20	0.02	0.59	0.31			0.49	0.01		0.75	0.21
Uniform Delay, d1	37.9	10.3	9.3	42.5	16.0			38.1	36.2		38.4	35.9
Progression Factor	0.89	1.47	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.0	0.2	0.0	8.7	0.5			0.7	0.0		12.7	0.2
Delay (s)	41.6	15.3	9.4	51.2	16.5			38.8	36.2		51.1	36.1
Level of Service	D	B	A	D	B			D	D		D	D
Approach Delay (s)		26.3			18.9			38.5			41.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	400	5	0	385	35	10	0	5	20	0	110
Future Volume (Veh/h)	95	400	5	0	385	35	10	0	5	20	0	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	99	417	5	0	401	36	10	0	5	21	0	115
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	437			422			933	1054	420	1042	1039	218
vC1, stage 1 conf vol							618	618		419	419	
vC2, stage 2 conf vol							316	437		622	620	
vCu, unblocked vol	437			321			880	1013	318	999	996	218
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			97	100	99	94	100	85
cM capacity (veh/h)	1119			1130			343	360	619	357	382	786

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	521	200	236	15	21	115
Volume Left	99	0	0	10	21	0
Volume Right	5	0	36	5	0	115
cSH	1119	1130	1700	403	357	786
Volume to Capacity	0.09	0.00	0.14	0.04	0.06	0.15
Queue Length 95th (ft)	7	0	0	3	5	13
Control Delay (s)	2.4	0.0	0.0	14.3	15.7	10.4
Lane LOS	A			B	C	B
Approach Delay (s)	2.4	0.0		14.3	11.2	
Approach LOS				B	B	

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	55.9%	ICU Level of Service		B
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	365	15	15	395	20	10
Future Vol, veh/h	365	15	15	395	20	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	384	16	16	416	21	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	400	0	839	392
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1159	-	336	657
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1159	-	330	657
Mov Cap-2 Maneuver	-	-	-	-	330	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	632	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	396	-	-	1159	-
HCM Lane V/C Ratio	0.08	-	-	0.014	-
HCM Control Delay (s)	14.9	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	350	10	5	385	20	5	0	10	35	0	15
Future Vol, veh/h	20	350	10	5	385	20	5	0	10	35	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	376	11	5	414	22	5	0	11	38	0	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	435	0	0	387	0	0	869	871	382	865	865	425
Stage 1	-	-	-	-	-	-	425	425	-	435	435	-
Stage 2	-	-	-	-	-	-	444	446	-	430	430	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1125	-	-	1171	-	-	272	289	665	274	292	629
Stage 1	-	-	-	-	-	-	607	586	-	600	580	-
Stage 2	-	-	-	-	-	-	593	574	-	603	583	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1125	-	-	1171	-	-	259	280	665	263	283	629
Mov Cap-2 Maneuver	-	-	-	-	-	-	259	280	-	263	283	-
Stage 1	-	-	-	-	-	-	592	571	-	585	577	-
Stage 2	-	-	-	-	-	-	574	571	-	578	568	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	13.6	18.6
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	437	1125	-	-	1171	-	-	319
HCM Lane V/C Ratio	0.037	0.019	-	-	0.005	-	-	0.169
HCM Control Delay (s)	13.6	8.3	0	-	8.1	0	-	18.6
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	250	270	50	55	135
Future Vol, veh/h	120	250	270	50	55	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	138	287	310	57	63	155

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	368	0	-	0	902	339
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	563	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1191	-	-	-	308	703
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1191	-	-	-	272	703
Mov Cap-2 Maneuver	-	-	-	-	272	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	504	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1191	-	-	-	482
HCM Lane V/C Ratio	0.116	-	-	-	0.453
HCM Control Delay (s)	8.4	-	-	-	18.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	2.3

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	170	140	120	20	20	205
Future Vol, veh/h	170	140	120	20	20	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	157	135	22	22	230

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	157	0	-	0	685	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	4.12	-	-	-	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	6.12	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1423	-	-	-	362	901
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	527	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1423	-	-	-	325	901
Mov Cap-2 Maneuver	-	-	-	-	325	-
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	456	-

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1423	-	-	-	778
HCM Lane V/C Ratio	0.134	-	-	-	0.325
HCM Control Delay (s)	7.9	-	-	-	11.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	1.4

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	175	210	25	30	45
Future Vol, veh/h	25	175	210	25	30	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	182	219	26	31	47

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	245	0	-	0	466	232
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	234	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1321	-	-	-	555	807
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	805	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1321	-	-	-	543	807
Mov Cap-2 Maneuver	-	-	-	-	543	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	787	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1321	-	-	-	676
HCM Lane V/C Ratio	0.02	-	-	-	0.116
HCM Control Delay (s)	7.8	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

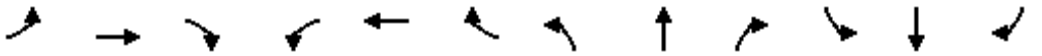
Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	125	150	40	50	65
Future Vol, veh/h	65	125	150	40	50	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	133	160	43	53	69

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	160	0	-	0	431	160
Stage 1	-	-	-	-	160	-
Stage 2	-	-	-	-	271	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1419	-	-	-	581	885
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	775	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	553	885
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	737	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	11.2
HCM LOS			B

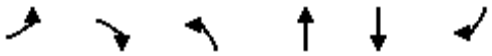
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	702
HCM Lane V/C Ratio	0.049	-	-	-	0.174
HCM Control Delay (s)	7.7	-	-	-	11.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	10	70	5	15	15	70	290	10	15	260	115
Future Volume (vph)	115	10	70	5	15	15	70	290	10	15	260	115
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1581		1593	1700		1593	1852		1593	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1581		1593	1700		1593	1852		1593	1863	1548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	121	11	74	5	16	16	74	305	11	16	274	121
RTOR Reduction (vph)	0	58	0	0	15	0	0	1	0	0	0	81
Lane Group Flow (vph)	121	27	0	5	17	0	74	315	0	16	274	40
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			4			1			2			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	8.8	11.1		0.7	3.0		5.3	21.8		0.7	17.2	17.2
Effective Green, g (s)	8.8	11.1		0.7	3.0		5.3	21.8		0.7	17.2	17.2
Actuated g/C Ratio	0.17	0.21		0.01	0.06		0.10	0.42		0.01	0.33	0.33
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	268	335		21	97		161	771		21	612	509
v/s Ratio Prot	c0.08	0.02		0.00	c0.01		c0.05	c0.17		0.01	0.15	
v/s Ratio Perm												0.03
v/c Ratio	0.45	0.08		0.24	0.17		0.46	0.41		0.76	0.45	0.08
Uniform Delay, d1	19.6	16.5		25.5	23.5		22.2	10.7		25.7	13.8	12.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1		5.8	0.9		2.1	0.4		92.1	0.5	0.1
Delay (s)	20.8	16.6		31.3	24.3		24.2	11.1		117.8	14.3	12.2
Level of Service	C	B		C	C		C	B		F	B	B
Approach Delay (s)		19.1			25.3			13.6			17.7	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	10	245	255	5
Future Volume (vph)	10	10	10	245	255	5
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3528	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3528	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	11	11	263	274	5
RTOR Reduction (vph)	0	11	0	0	1	0
Lane Group Flow (vph)	11	0	11	263	278	0
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	0.8	0.8	0.8	28.0	23.7	
Effective Green, g (s)	0.8	0.8	0.8	28.0	23.7	
Actuated g/C Ratio	0.02	0.02	0.02	0.74	0.63	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	33	33	33	1387	2223	
v/s Ratio Prot	c0.01		0.01	c0.14	0.08	
v/s Ratio Perm		0.00				
v/c Ratio	0.33	0.01	0.33	0.19	0.13	
Uniform Delay, d1	18.1	18.0	18.1	1.4	2.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.0	2.2	0.1	0.1	
Delay (s)	20.3	18.0	20.3	1.6	2.8	
Level of Service	C	B	C	A	A	
Approach Delay (s)	19.2			2.3	2.8	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	37.6	Sum of lost time (s)	12.3
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	15	235	20	10	245
Future Vol, veh/h	15	15	235	20	10	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	16	255	22	11	266

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	554	266	0	0	277	0
Stage 1	266	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	493	773	-	-	1286	-
Stage 1	779	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	488	773	-	-	1286	-
Mov Cap-2 Maneuver	572	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	753	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	657	1286	-
HCM Lane V/C Ratio	-	-	0.05	0.008	-
HCM Control Delay (s)	-	-	10.8	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	35	230	15	35	245
Future Vol, veh/h	15	35	230	15	35	245
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	37	242	16	37	258

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	583	251	0	0	259	0
Stage 1	251	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	475	788	-	-	1306	-
Stage 1	791	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	459	787	-	-	1306	-
Mov Cap-2 Maneuver	547	-	-	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	703	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	695	1306	-
HCM Lane V/C Ratio	-	-	0.076	0.028	-
HCM Control Delay (s)	-	-	10.6	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

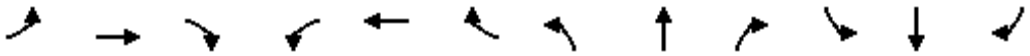
Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	5	15	35	10	30	10	235	25	25	230	10
Future Vol, veh/h	15	5	15	35	10	30	10	235	25	25	230	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	5	16	37	11	32	11	250	27	27	245	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	609	602	250	600	595	264	255	0	0	278	0	0
Stage 1	303	303	-	286	286	-	-	-	-	-	-	-
Stage 2	306	299	-	314	309	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	407	414	789	413	417	775	1310	-	-	1285	-	-
Stage 1	706	664	-	721	675	-	-	-	-	-	-	-
Stage 2	704	666	-	697	660	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	372	399	789	390	402	774	1310	-	-	1285	-	-
Mov Cap-2 Maneuver	372	399	-	390	402	-	-	-	-	-	-	-
Stage 1	699	647	-	713	668	-	-	-	-	-	-	-
Stage 2	658	659	-	660	644	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	13.8	0.3	0.7
HCM LOS	B	B		

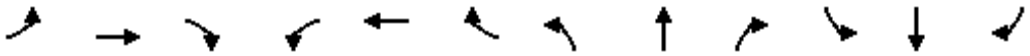
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1310	-	-	487	489	1285	-	-
HCM Lane V/C Ratio	0.008	-	-	0.076	0.163	0.021	-	-
HCM Control Delay (s)	7.8	0	-	13	13.8	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.6	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	175	100	145	195	100	80	195	110	100	160	35
Future Volume (vph)	20	175	100	145	195	100	80	195	110	100	160	35
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1561	1593	3539	1558	1593	3331		1593	3435	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1561	1593	3539	1558	1593	3331		1593	3435	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	186	106	154	207	106	85	207	117	106	170	37
RTOR Reduction (vph)	0	0	81	0	0	68	0	75	0	0	17	0
Lane Group Flow (vph)	21	186	25	154	207	38	85	249	0	106	190	0
Confl. Peds. (#/hr)						6			2			5
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.0	14.8	14.8	8.8	22.6	22.6	6.6	14.5		7.3	15.2	
Effective Green, g (s)	1.0	14.8	14.8	8.8	22.6	22.6	6.6	14.5		7.3	15.2	
Actuated g/C Ratio	0.02	0.24	0.24	0.14	0.36	0.36	0.11	0.23		0.12	0.24	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	25	839	370	224	1281	564	168	774		186	836	
v/s Ratio Prot	0.01	c0.05		c0.10	0.06		0.05	c0.07		c0.07	0.06	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.84	0.22	0.07	0.69	0.16	0.07	0.51	0.32		0.57	0.23	
Uniform Delay, d1	30.6	19.2	18.5	25.5	13.5	13.0	26.4	19.9		26.1	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	106.1	0.3	0.2	6.8	0.1	0.1	0.9	0.5		2.4	0.3	
Delay (s)	136.7	19.4	18.6	32.3	13.6	13.1	27.2	20.4		28.4	19.2	
Level of Service	F	B	B	C	B	B	C	C		C	B	
Approach Delay (s)		27.0			19.7			21.8			22.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	35	15	225	35	60	45	300	210	50	300	75
Future Volume (vph)	40	35	15	225	35	60	45	300	210	50	300	75
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	1780		1593	1686		1593	3315		1593	3416	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	1780		1593	1686		1593	3315		1593	3416	
Peak-hour factor, PHF	0.96	0.92	0.96	0.92	0.92	0.92	0.96	0.96	0.92	0.92	0.96	0.96
Adj. Flow (vph)	42	38	16	245	38	65	47	312	228	54	312	78
RTOR Reduction (vph)	0	15	0	0	46	0	0	133	0	0	21	0
Lane Group Flow (vph)	42	39	0	245	57	0	47	408	0	54	370	0
Confl. Peds. (#/hr)												2
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.9	3.7		16.3	16.1		4.0	14.2		4.1	14.3	
Effective Green, g (s)	3.9	3.7		16.3	16.1		4.0	14.2		4.1	14.3	
Actuated g/C Ratio	0.07	0.07		0.29	0.29		0.07	0.25		0.07	0.25	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	110	116		461	482		113	836		116	867	
v/s Ratio Prot	0.03	c0.02		c0.15	0.03		0.03	c0.12		c0.03	0.11	
v/s Ratio Perm												
v/c Ratio	0.38	0.34		0.53	0.12		0.42	0.49		0.47	0.43	
Uniform Delay, d1	25.0	25.1		16.8	14.9		25.0	17.9		25.0	17.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	1.7		1.2	0.1		2.5	0.5		2.9	0.3	
Delay (s)	27.3	26.9		18.0	15.0		27.5	18.4		28.0	17.9	
Level of Service	C	C		B	B		C	B		C	B	
Approach Delay (s)		27.0			17.1			19.1			19.1	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	56.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

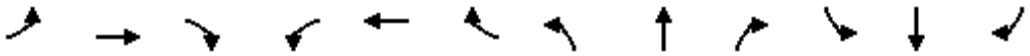
Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	45	295	15	40	305
Future Vol, veh/h	15	45	295	15	40	305
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	48	317	16	43	328

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	575	167	0	0	333	0
Stage 1	325	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	448	848	-	-	1223	-
Stage 1	705	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	429	848	-	-	1223	-
Mov Cap-2 Maneuver	524	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	735	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	1
HCM LOS	B		

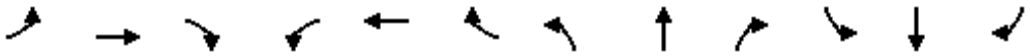
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	734	1223	-
HCM Lane V/C Ratio	-	-	0.088	0.035	-
HCM Control Delay (s)	-	-	10.4	8.1	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	20	10	10	10	35	315	5	10	355	50
Future Volume (vph)	35	0	20	10	10	10	35	315	5	10	355	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.95		1.00	1.00		1.00	0.98	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1708			1750		1593	3530		1593	3464	
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1708			1750		1593	3530		1593	3464	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	38	0	22	11	11	11	38	339	5	11	382	54
RTOR Reduction (vph)	0	50	0	0	10	0	0	1	0	0	12	0
Lane Group Flow (vph)	0	10	0	0	23	0	38	343	0	11	424	0
Confl. Peds. (#/hr)			2						1			
Confl. Bikes (#/hr)									2			1
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.7			5.9		2.2	16.2		0.7	14.7	
Effective Green, g (s)		7.7			5.9		2.2	16.2		0.7	14.7	
Actuated g/C Ratio		0.16			0.13		0.05	0.34		0.01	0.31	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		279			219		74	1216		23	1083	
v/s Ratio Prot		c0.01			c0.01		c0.02	0.10		0.01	c0.12	
v/s Ratio Perm												
v/c Ratio		0.04			0.11		0.51	0.28		0.48	0.39	
Uniform Delay, d1		16.5			18.2		21.9	11.2		23.0	12.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.1		2.5	0.3		5.6	0.5	
Delay (s)		16.5			18.3		24.4	11.4		28.6	13.1	
Level of Service		B			B		C	B		C	B	
Approach Delay (s)		16.5			18.3			12.7			13.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	47.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

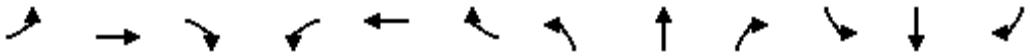
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	15	5	0	0	15	430	5	15	480	20
Future Volume (vph)	20	0	15	5	0	0	15	430	5	15	480	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1697			1770		1593	3532		1593	3514	
Flt Permitted		0.83			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1451			1863		1593	3532		1593	3514	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	22	0	16	5	0	0	16	462	5	16	516	22
RTOR Reduction (vph)	0	35	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	3	0	0	5	0	16	467	0	16	536	0
Confl. Peds. (#/hr)			5			8			7			
Confl. Bikes (#/hr)									1			3
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		3.8			0.6		0.7	29.5		0.7	29.5	
Effective Green, g (s)		3.8			0.6		0.7	29.5		0.7	29.5	
Actuated g/C Ratio		0.07			0.01		0.01	0.58		0.01	0.58	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		107			21		21	2039		21	2028	
v/s Ratio Prot							c0.01	0.13		0.01	c0.15	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.03			0.24		0.76	0.23		0.76	0.26	
Uniform Delay, d1		21.9			25.0		25.1	5.3		25.1	5.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			2.1		85.5	0.2		85.5	0.2	
Delay (s)		22.0			27.2		110.6	5.4		110.6	5.6	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		22.0			27.2			8.9			8.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	220	55	155	260	315	70	310	120	275	360	135
Future Volume (vph)	95	220	55	155	260	315	70	310	120	275	360	135
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1545	1593	3539	1551	1593	3374		1593	3378	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1545	1593	3539	1551	1593	3374		1593	3378	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	100	232	58	163	274	332	74	326	126	289	379	142
RTOR Reduction (vph)	0	0	48	0	0	250	0	29	0	0	23	0
Lane Group Flow (vph)	100	232	10	163	274	82	74	423	0	289	498	0
Confl. Peds. (#/hr)			4			10			5			4
Confl. Bikes (#/hr)			7						2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.9	16.1	16.1	14.6	22.8	22.8	7.7	21.2		24.6	37.8	
Effective Green, g (s)	7.9	16.1	16.1	14.6	22.8	22.8	7.7	21.2		24.6	37.8	
Actuated g/C Ratio	0.09	0.17	0.17	0.16	0.25	0.25	0.08	0.23		0.27	0.41	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	263	614	268	250	870	381	132	771		422	1377	
v/s Ratio Prot	0.03	c0.07		c0.10	0.08		0.05	c0.13		c0.18	0.15	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.38	0.38	0.04	0.65	0.31	0.21	0.56	0.55		0.68	0.36	
Uniform Delay, d1	40.1	33.9	31.9	36.7	28.6	27.8	40.9	31.5		30.6	19.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.8	0.1	4.6	0.4	0.6	3.2	1.4		3.7	0.3	
Delay (s)	40.4	34.7	32.0	41.3	29.0	28.4	44.1	32.9		34.2	19.4	
Level of Service	D	C	C	D	C	C	D	C		C	B	
Approach Delay (s)		35.8			31.3			34.5			24.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	92.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	83	60	310	88	295	5	55	700	378	244	295
Future Volume (vph)	10	83	60	310	88	295	5	55	700	378	244	295
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1490	3312	1461	2891	1518	1408		1490	3312	1482	2891	3312
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1490	3312	1461	2891	1518	1408		1490	3312	1482	2891	3312
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	11	94	68	352	100	335	6	62	795	430	277	335
RTOR Reduction (vph)	0	0	57	0	34	165	0	0	0	161	0	0
Lane Group Flow (vph)	11	94	11	352	190	46	0	69	795	269	277	335
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot	NA
Protected Phases	8	8		7	7		1	1	6	7	5	2
Permitted Phases			8			7				6		
Actuated Green, G (s)	18.2	18.2	18.2	24.3	24.3	24.3		9.4	31.9	56.2	16.3	38.8
Effective Green, g (s)	18.2	18.2	18.2	24.3	24.3	24.3		9.4	31.9	56.2	16.3	38.8
Actuated g/C Ratio	0.16	0.16	0.16	0.22	0.22	0.22		0.08	0.29	0.51	0.15	0.35
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	3.0	5.0
Lane Grp Cap (vph)	244	544	239	634	332	308		126	953	751	425	1159
v/s Ratio Prot	0.01	c0.03		0.12	c0.12			0.05	c0.24	0.08	c0.10	0.10
v/s Ratio Perm			0.01			0.03				0.10		
v/c Ratio	0.05	0.17	0.05	0.56	0.57	0.15		0.55	0.83	0.36	0.65	0.29
Uniform Delay, d1	39.0	39.8	39.0	38.4	38.6	34.9		48.7	37.0	16.4	44.6	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	1.1	2.4	0.2		4.8	7.1	0.3	3.6	0.3
Delay (s)	39.1	40.0	39.1	39.5	41.0	35.1		53.5	44.1	16.7	48.1	26.3
Level of Service	D	D	D	D	D	D		D	D	B	D	C
Approach Delay (s)		39.6			38.8				35.5			36.1
Approach LOS		D			D				D			D

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	20.1
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1448
Flt Permitted	1.00
Satd. Flow (perm)	1448
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	6
RTOR Reduction (vph)	4
Lane Group Flow (vph)	2
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	9%
Turn Type	Perm
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	38.8
Effective Green, g (s)	38.8
Actuated g/C Ratio	0.35
Clearance Time (s)	6.5
Vehicle Extension (s)	5.0
Lane Grp Cap (vph)	507
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.00
Uniform Delay, d1	23.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	23.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	30	80	590	40	233	538	103	100	130	534	78	55
Future Volume (vph)	30	80	590	40	233	538	103	100	130	534	78	55
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900
Total Lost time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1533	3406	1524	1533	3406	1484	1533	1792	1524	1533	1670
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1533	3406	1524	1533	3406	1484	1533	1792	1524	1533	1670
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	89	656	44	259	598	114	111	144	593	87	61
RTOR Reduction (vph)	0	0	0	30	0	0	68	0	0	474	0	20
Lane Group Flow (vph)	0	122	656	14	259	598	46	111	144	119	87	85
Confl. Peds. (#/hr)							3					
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			6			3		
Actuated Green, G (s)		12.5	29.9	29.9	22.0	39.4	39.4	14.6	14.6	14.6	13.1	13.1
Effective Green, g (s)		12.5	29.9	29.9	22.0	39.4	39.4	14.6	14.6	14.6	13.1	13.1
Actuated g/C Ratio		0.13	0.31	0.31	0.23	0.41	0.41	0.15	0.15	0.15	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0	2.0	8.0	8.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		197	1048	469	347	1382	602	230	269	229	206	225
v/s Ratio Prot		0.08	c0.19		c0.17	0.18		0.07	c0.08		c0.06	0.05
v/s Ratio Perm				0.01			0.03			0.08		
v/c Ratio		0.62	0.63	0.03	0.75	0.43	0.08	0.48	0.54	0.52	0.42	0.38
Uniform Delay, d1		40.0	28.8	23.5	35.0	20.8	17.7	37.8	38.1	38.0	38.5	38.3
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.0	2.7	0.1	7.5	0.9	0.2	0.6	1.0	0.8	0.5	0.4
Delay (s)		44.1	31.5	23.6	42.4	21.7	17.9	38.4	39.1	38.8	39.0	38.7
Level of Service		D	C	C	D	C	B	D	D	D	D	D
Approach Delay (s)			32.9			26.8			38.8			38.8
Approach LOS			C			C			D			D

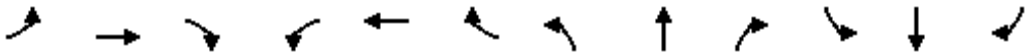
Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	44
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1107	25	40	799	330	5	5	15	261	15	45
Future Volume (vph)	40	1107	25	40	799	330	5	5	15	261	15	45
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (prot)	1533	3394		1533	3406	1486		1628			1687	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (perm)	1533	3394		1533	3406	1486		1628			1687	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	49	1367	31	49	986	407	6	6	19	322	19	56
RTOR Reduction (vph)	0	1	0	0	0	244	0	18	0	0	4	0
Lane Group Flow (vph)	49	1397	0	49	986	163	0	13	0	0	393	0
Confl. Peds. (#/hr)						3						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						
Actuated Green, G (s)	4.7	35.4		4.7	35.0	35.0		3.3			26.0	
Effective Green, g (s)	4.7	35.4		4.7	35.0	35.0		3.3			26.0	
Actuated g/C Ratio	0.05	0.41		0.05	0.40	0.40		0.04			0.30	
Clearance Time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Vehicle Extension (s)	2.0	7.9		2.0	7.3	7.3		2.0			2.0	
Lane Grp Cap (vph)	82	1377		82	1367	596		61			503	
v/s Ratio Prot	c0.03	c0.41		0.03	0.29			c0.01			c0.23	
v/s Ratio Perm						0.11						
v/c Ratio	0.60	1.01		0.60	0.72	0.27		0.21			0.78	
Uniform Delay, d1	40.3	25.9		40.3	22.0	17.6		40.7			28.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	7.6	27.9		7.6	3.1	0.9		0.6			7.1	
Delay (s)	47.9	53.8		47.9	25.1	18.5		41.3			35.1	
Level of Service	D	D		D	C	B		D			D	
Approach Delay (s)		53.6			24.0			41.3			35.1	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	18.2
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	1338	10	5	5	1134	38	5	0	10	33	0
Future Volume (vph)	15	1338	10	5	5	1134	38	5	0	10	33	0
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Frt	1.00	1.00			1.00	1.00			0.91			0.95
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.97
Satd. Flow (prot)	1518	3370			1518	3355			1589			1635
Flt Permitted	0.95	1.00			0.95	1.00			0.91			0.80
Satd. Flow (perm)	1518	3370			1518	3355			1468			1347
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	18	1612	12	6	6	1366	46	6	0	12	40	0
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	17	0	0	61
Lane Group Flow (vph)	18	1624	0	0	12	1411	0	0	1	0	0	3
Confl. Peds. (#/hr)			1				1					
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	2.8	80.1			1.4	78.7			4.8			4.8
Effective Green, g (s)	2.8	80.1			1.4	78.7			4.8			4.8
Actuated g/C Ratio	0.03	0.80			0.01	0.79			0.05			0.05
Clearance Time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Vehicle Extension (s)	2.0	7.3			2.0	7.3			2.0			2.0
Lane Grp Cap (vph)	42	2699			21	2640			70			64
v/s Ratio Prot	c0.01	c0.48			0.01	0.42						
v/s Ratio Perm									0.00			c0.00
v/c Ratio	0.43	0.60			0.57	0.53			0.01			0.05
Uniform Delay, d1	47.8	3.8			49.0	3.9			45.3			45.4
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	2.5	1.0			21.2	0.8			0.0			0.1
Delay (s)	50.4	4.8			70.2	4.7			45.4			45.5
Level of Service	D	A			E	A			D			D
Approach Delay (s)		5.3				5.2			45.4			45.5
Approach LOS		A				A			D			D

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	7%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	332	999	15	10	30	1018	415	15	15	20	332	5
Future Volume (vph)	332	999	15	10	30	1018	415	15	15	20	332	5
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.95
Satd. Flow (prot)	1533	3398			1533	3406	1524		1749	1524	1456	1624
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.95
Satd. Flow (perm)	1533	3398			1533	3406	1524		1749	1524	1456	1624
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	377	1135	17	11	34	1157	472	17	17	23	377	6
RTOR Reduction (vph)	0	1	0	0	0	0	314	0	0	22	0	0
Lane Group Flow (vph)	377	1151	0	0	45	1157	158	0	34	1	192	191
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	24.4	51.2			4.1	29.9	29.9		3.3	3.3	14.7	14.7
Effective Green, g (s)	24.4	51.2			4.1	29.9	29.9		3.3	3.3	14.7	14.7
Actuated g/C Ratio	0.27	0.57			0.05	0.33	0.33		0.04	0.04	0.16	0.16
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	415	1933			69	1131	506		64	55	237	265
v/s Ratio Prot	c0.25	0.34			0.03	c0.34			c0.02		c0.13	0.12
v/s Ratio Perm							0.10			0.00		
v/c Ratio	0.91	0.60			0.65	1.02	0.31		0.53	0.02	0.81	0.72
Uniform Delay, d1	31.7	12.6			42.2	30.1	22.4		42.6	41.8	36.3	35.7
Progression Factor	1.00	1.00			1.14	0.70	0.83		1.00	1.00	1.00	1.00
Incremental Delay, d2	22.7	1.4			11.7	28.9	1.2		4.2	0.0	17.7	7.9
Delay (s)	54.5	14.0			59.6	50.0	19.8		46.8	41.8	54.0	43.6
Level of Service	D	B			E	D	B		D	D	D	D
Approach Delay (s)		24.0				41.8			44.8			43.1
Approach LOS		C				D			D			D

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	177
Future Volume (vph)	177
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	201
RTOR Reduction (vph)	168
Lane Group Flow (vph)	33
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	14.7
Effective Green, g (s)	14.7
Actuated g/C Ratio	0.16
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	248
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.13
Uniform Delay, d1	32.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	32.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

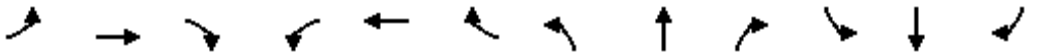
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1357	5	25	1379	186	0	0	30	0	0	74
Future Vol, veh/h	0	1357	5	25	1379	186	0	0	30	0	0	74
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	6	6	6	6	2	6	2	6	2	2	2
Mvmt Flow	0	1542	6	28	1567	211	0	0	34	0	0	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1549	0	0	-	-	775	-	-	889
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	5.42	-	-	-	-	7.22	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.16	-	-	-	-	3.96	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	202	-	-	0	0	286	0	0	246
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	202	-	-	-	-	286	-	-	246
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	19.3	27
HCM LOS			C	D

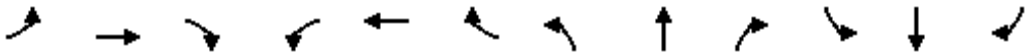
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	286	-	-	202	-	-	246
HCM Lane V/C Ratio	0.119	-	-	0.141	-	-	0.342
HCM Control Delay (s)	19.3	-	-	25.7	-	-	27
HCM Lane LOS	C	-	-	D	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	0.5	-	-	1.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1025	332	250	920	0	0	0	0	190	0	659
Future Volume (vph)	0	1025	332	250	920	0	0	0	0	190	0	659
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6285	1517	1562	3471						1736	1553
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6285	1517	1562	3471						1736	1553
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	1206	391	294	1082	0	0	0	0	224	0	775
RTOR Reduction (vph)	0	0	260	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	0	1206	131	294	1082	0	0	0	0	0	224	669
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		30.1	30.1	19.2	53.5						26.8	26.8
Effective Green, g (s)		30.1	30.1	19.2	53.5						26.8	26.8
Actuated g/C Ratio		0.33	0.33	0.21	0.59						0.30	0.30
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2101	507	333	2063						516	462
v/s Ratio Prot		c0.19		c0.19	0.31						0.13	
v/s Ratio Perm			0.09									c0.43
v/c Ratio		0.57	0.26	0.88	0.52						0.43	1.45
Uniform Delay, d1		24.7	21.8	34.3	10.8						25.5	31.6
Progression Factor		0.81	0.74	0.88	1.03						1.00	1.00
Incremental Delay, d2		1.0	1.1	12.7	0.5						0.4	213.5
Delay (s)		20.9	17.3	42.8	11.5						25.9	245.1
Level of Service		C	B	D	B						C	F
Approach Delay (s)		20.1			18.2			0.0			195.9	
Approach LOS		C			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	63.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	556	664	0	0	699	520	481	0	265	0	0	0
Future Volume (vph)	556	664	0	0	699	520	481	0	265	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	632	755	0	0	794	591	547	0	301	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	288	0	0	159	0	0	0
Lane Group Flow (vph)	632	755	0	0	794	303	0	547	142	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	22.2	54.9			28.5	28.5		25.4	25.4			
Effective Green, g (s)	22.2	54.9			28.5	28.5		25.4	25.4			
Actuated g/C Ratio	0.25	0.61			0.32	0.32		0.28	0.28			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	754	2138			1109	496		494	442			
v/s Ratio Prot	c0.21	0.22			c0.23			c0.31				
v/s Ratio Perm						0.19			0.09			
v/c Ratio	0.84	0.35			0.72	0.61		1.11	0.32			
Uniform Delay, d1	32.2	8.7			27.2	26.0		32.3	25.5			
Progression Factor	0.49	0.12			1.18	1.89		1.00	1.00			
Incremental Delay, d2	7.2	0.4			3.3	4.6		73.1	0.5			
Delay (s)	23.1	1.5			35.4	53.7		105.4	25.9			
Level of Service	C	A			D	D		F	C			
Approach Delay (s)		11.3			43.3			77.2			0.0	
Approach LOS		B			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



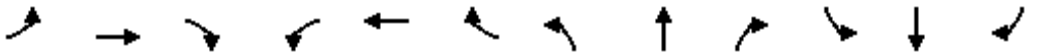
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	366	388	170	65	626	130	160	30	65	70	25
Future Volume (vph)	15	366	388	170	65	626	130	160	30	65	70	25
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3090	3539	1549	1593	3439			1788	1558		1796
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3090	3539	1549	1593	3439			1788	1558		1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	385	408	179	68	659	137	168	32	68	74	26
RTOR Reduction (vph)	0	0	0	90	0	14	0	0	0	57	0	0
Lane Group Flow (vph)	0	401	408	89	68	782	0	0	200	11	0	100
Confl. Peds. (#/hr)				1			2			4		
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		14.4	44.5	44.5	5.5	34.7			14.1	14.1		8.7
Effective Green, g (s)		14.4	44.5	44.5	5.5	34.7			14.1	14.1		8.7
Actuated g/C Ratio		0.16	0.49	0.49	0.06	0.39			0.16	0.16		0.10
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		494	1749	765	97	1325			280	244		173
v/s Ratio Prot		c0.13	0.12		0.04	c0.23			c0.11			c0.06
v/s Ratio Perm				0.06						0.01		
v/c Ratio		0.81	0.23	0.12	0.70	0.59			0.71	0.04		0.58
Uniform Delay, d1		36.5	13.0	12.2	41.4	22.0			36.0	32.2		38.9
Progression Factor		0.80	1.19	2.77	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		8.8	0.3	0.3	17.0	1.9			7.0	0.0		2.9
Delay (s)		38.0	15.8	34.1	58.4	23.9			43.0	32.3		41.8
Level of Service		D	B	C	E	C			D	C		D
Approach Delay (s)			28.1			26.7			40.3			38.8
Approach LOS			C			C			D			D

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	423
Future Volume (vph)	423
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	445
RTOR Reduction (vph)	402
Lane Group Flow (vph)	43
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.7
Effective Green, g (s)	8.7
Actuated g/C Ratio	0.10
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	153
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.28
Uniform Delay, d1	37.7
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	38.1
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	473	5	5	726	20	0	0	0	15	0	105
Future Volume (Veh/h)	45	473	5	5	726	20	0	0	0	15	0	105
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	51	531	6	6	816	22	0	0	0	17	0	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	838			537			1174	1486	534	1475	1478	419
vC1, stage 1 conf vol							636	636		839	839	
vC2, stage 2 conf vol							538	850		636	639	
vCu, unblocked vol	838			429			1138	1484	426	1472	1476	419
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			100	100	100	93	100	80
cM capacity (veh/h)	779			1001			273	267	514	255	291	577

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	588	414	430	0	17	118
Volume Left	51	6	0	0	17	0
Volume Right	6	0	22	0	0	118
cSH	779	1001	1700	1700	255	577
Volume to Capacity	0.07	0.01	0.25	0.00	0.07	0.20
Queue Length 95th (ft)	5	0	0	0	5	19
Control Delay (s)	1.7	0.2	0.0	0.0	20.1	12.8
Lane LOS	A	A		A	C	B
Approach Delay (s)	1.7	0.1		0.0	13.8	
Approach LOS				A	B	

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	61.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	438	55	25	711	20	10
Future Vol, veh/h	438	55	25	711	20	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	481	60	27	781	22	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	542	0	1348	512
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	836	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1012	-	164	556
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1012	-	156	556
Mov Cap-2 Maneuver	-	-	-	-	156	-
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	400	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	25.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	205	-	-	1012	-
HCM Lane V/C Ratio	0.161	-	-	0.027	-
HCM Control Delay (s)	25.9	-	-	8.7	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	433	10	5	706	5	15	0	5	10	0	20
Future Vol, veh/h	5	433	10	5	706	5	15	0	5	10	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	487	11	6	793	6	17	0	6	11	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	799	0	0	498	0	0	1322	1313	492	1313	1316	796
Stage 1	-	-	-	-	-	-	503	503	-	807	807	-
Stage 2	-	-	-	-	-	-	819	810	-	506	509	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	824	-	-	1066	-	-	133	158	577	135	158	387
Stage 1	-	-	-	-	-	-	551	541	-	375	394	-
Stage 2	-	-	-	-	-	-	369	393	-	549	538	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	824	-	-	1066	-	-	123	155	577	132	155	387
Mov Cap-2 Maneuver	-	-	-	-	-	-	123	155	-	132	155	-
Stage 1	-	-	-	-	-	-	545	536	-	371	390	-
Stage 2	-	-	-	-	-	-	344	389	-	538	533	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	32.5	22.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	153	824	-	-	1066	-	-	235
HCM Lane V/C Ratio	0.147	0.007	-	-	0.005	-	-	0.143
HCM Control Delay (s)	32.5	9.4	0	-	8.4	0	-	22.9
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	120	328	488	55	40	208
Future Vol, veh/h	120	328	488	55	40	208
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	364	542	61	44	231

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	603	0	-	0	1204	573
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	631	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	975	-	-	-	203	519
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	530	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	975	-	-	-	175	519
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	458	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	32.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	975	-	-	-	394
HCM Lane V/C Ratio	0.137	-	-	-	0.699
HCM Control Delay (s)	9.3	-	-	-	32.8
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.5	-	-	-	5.2

Intersection	
Int Delay, s/veh	13

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	305	63	163	45	45	385
Future Vol, veh/h	305	63	163	45	45	385
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	335	69	179	49	49	423

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	229	0	-	0	944	204
Stage 1	-	-	-	-	204	-
Stage 2	-	-	-	-	740	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1339	-	-	-	291	837
Stage 1	-	-	-	-	830	-
Stage 2	-	-	-	-	472	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1339	-	-	-	218	837
Mov Cap-2 Maneuver	-	-	-	-	218	-
Stage 1	-	-	-	-	830	-
Stage 2	-	-	-	-	354	-

Approach	EB	WB	SB
HCM Control Delay, s	7.1	0	24.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1339	-	-	-	645
HCM Lane V/C Ratio	0.25	-	-	-	0.733
HCM Control Delay (s)	8.6	-	-	-	24.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	1	-	-	-	6.3

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	255	354	30	40	76
Future Vol, veh/h	45	255	354	30	40	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	304	421	36	48	90

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	457	0	-	0	850	439
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	411	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1104	-	-	-	331	618
Stage 1	-	-	-	-	650	-
Stage 2	-	-	-	-	669	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1104	-	-	-	311	618
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	650	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1104	-	-	-	461
HCM Lane V/C Ratio	0.049	-	-	-	0.3
HCM Control Delay (s)	8.4	0	-	-	16.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2

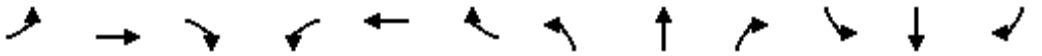
Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	255	228	30	70	116
Future Vol, veh/h	55	255	228	30	70	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	81	375	335	44	103	171

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	335	0	-	0	872	335
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	537	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1213	-	-	-	319	702
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	582	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1213	-	-	-	298	702
Mov Cap-2 Maneuver	-	-	-	-	298	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	23.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1213	-	-	-	465
HCM Lane V/C Ratio	0.067	-	-	-	0.588
HCM Control Delay (s)	8.2	-	-	-	23.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	3.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	20	125	10	10	10	65	360	15	15	400	143
Future Volume (vph)	220	20	125	10	10	10	65	360	15	15	400	143
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1547	1576		1547	1674		1547	1799		1547	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1547	1576		1547	1674		1547	1799		1547	1810	1538
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	262	24	149	12	12	12	77	429	18	18	476	170
RTOR Reduction (vph)	0	125	0	0	12	0	0	1	0	0	0	99
Lane Group Flow (vph)	262	48	0	12	12	0	77	446	0	18	476	71
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	8.7	9.2		0.7	1.2		5.1	28.0		0.7	23.6	23.6
Effective Green, g (s)	8.7	9.2		0.7	1.2		5.1	28.0		0.7	23.6	23.6
Actuated g/C Ratio	0.15	0.16		0.01	0.02		0.09	0.49		0.01	0.42	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	237	256		19	35		139	889		19	754	641
v/s Ratio Prot	c0.17	c0.03		0.01	0.01		c0.05	c0.25		0.01	c0.26	
v/s Ratio Perm												0.05
v/c Ratio	1.11	0.19		0.63	0.35		0.55	0.50		0.95	0.63	0.11
Uniform Delay, d1	24.0	20.5		27.8	27.3		24.7	9.6		27.9	13.1	10.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	89.6	0.4		52.7	6.0		4.7	0.4		179.6	1.7	0.1
Delay (s)	113.6	20.8		80.6	33.3		29.4	10.1		207.5	14.8	10.2
Level of Service	F	C		F	C		C	B		F	B	B
Approach Delay (s)		76.7			49.0			12.9			18.8	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	0	5	153	0	7	53	225	410	24	50	287
Future Volume (vph)	10	0	5	153	0	7	53	225	410	24	50	287
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.98
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3474
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3474
Peak-hour factor, PHF	0.79	0.92	0.79	0.92	0.92	0.92	0.92	0.79	0.79	0.92	0.92	0.79
Adj. Flow (vph)	13	0	6	166	0	8	58	285	519	26	54	363
RTOR Reduction (vph)	0	0	6	0	0	7	0	0	0	12	0	10
Lane Group Flow (vph)	0	13	0	83	83	1	0	343	519	14	54	404
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		1.8	1.8	6.8	6.8	6.8		20.4	35.1	35.1	4.2	18.9
Effective Green, g (s)		1.8	1.8	6.8	6.8	6.8		20.4	35.1	35.1	4.2	18.9
Actuated g/C Ratio		0.03	0.03	0.10	0.10	0.10		0.31	0.53	0.53	0.06	0.28
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0		2.0	4.9	4.9	2.0	4.9
Lane Grp Cap (vph)		47	42	154	171	161		487	980	833	100	984
v/s Ratio Prot		c0.01		c0.05	0.05			c0.22	c0.28		0.03	0.12
v/s Ratio Perm			0.00			0.00				0.01		
v/c Ratio		0.28	0.00	0.54	0.49	0.01		0.70	0.53	0.02	0.54	0.41
Uniform Delay, d1		31.8	31.6	28.5	28.3	26.9		20.5	10.4	7.6	30.3	19.4
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	0.0	1.8	0.8	0.0		3.8	1.0	0.0	3.2	0.6
Delay (s)		33.0	31.6	30.3	29.1	26.9		24.2	11.3	7.6	33.5	19.9
Level of Service		C	C	C	C	C		C	B	A	C	B
Approach Delay (s)		32.5			29.6				16.2			21.5
Approach LOS		C			C				B			C

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	18.8
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	51
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	20	396	20	10	334
Future Vol, veh/h	15	20	396	20	10	334
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	18	24	483	24	12	407

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	928	496	0	0	508	0
Stage 1	496	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	296	572	-	-	1052	-
Stage 1	610	-	-	-	-	-
Stage 2	652	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	291	571	-	-	1052	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	642	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	494	1052	-
HCM Lane V/C Ratio	-	-	0.086	0.012	-
HCM Control Delay (s)	-	-	13	8.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	5	48	60	413	23	30	296
Future Vol, veh/h	5	48	60	413	23	30	296
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	0	-	-	0
Grade, %	-	0	-	0	-	-	0
Peak Hour Factor	92	79	79	79	79	79	79
Heavy Vehicles, %	2	3	3	3	3	3	3
Mvmt Flow	5	61	76	523	29	38	375

Major/Minor	Minor1			Major1		Major2	
Conflicting Flow All	0	988	537	0	0	552	0
Stage 1	0	537	-	-	-	-	-
Stage 2	0	451	-	-	-	-	-
Critical Hdwy	-	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	-	5.43	-	-	-	-	-
Critical Hdwy Stg 2	-	5.43	-	-	-	-	-
Follow-up Hdwy	-	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	0	273	542	-	-	1013	-
Stage 1	0	584	-	-	-	-	-
Stage 2	0	640	-	-	-	-	-
Platoon blocked, %	-			-	-		-
Mov Cap-1 Maneuver	0	260	542	-	-	1013	-
Mov Cap-2 Maneuver	0	391	-	-	-	-	-
Stage 1	0	584	-	-	-	-	-
Stage 2	0	610	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	463	1013	-
HCM Lane V/C Ratio	-	-	0.295	0.037	-
HCM Control Delay (s)	-	-	16	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

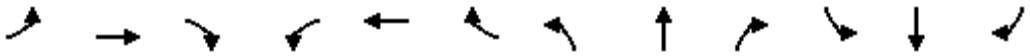
Intersection	
Int Delay, s/veh	22.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	5	69	5	130	5	370	78	85	272	10
Future Vol, veh/h	10	5	5	69	5	130	5	370	78	85	272	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	7	7	93	7	176	7	500	105	115	368	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1261	1223	374	1177	1177	553	381	0	0	605	0	0
Stage 1	604	604	-	566	566	-	-	-	-	-	-	-
Stage 2	657	619	-	611	611	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	179	672	168	191	533	1177	-	-	973	-	-
Stage 1	485	488	-	509	507	-	-	-	-	-	-	-
Stage 2	454	480	-	481	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	84	151	672	141	161	533	1177	-	-	973	-	-
Mov Cap-2 Maneuver	84	151	-	141	161	-	-	-	-	-	-	-
Stage 1	481	415	-	504	502	-	-	-	-	-	-	-
Stage 2	298	476	-	398	411	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.6	105.3	0.1	2.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1177	-	-	125	267	973	-	-
HCM Lane V/C Ratio	0.006	-	-	0.216	1.032	0.118	-	-
HCM Control Delay (s)	8.1	0	-	41.6	105.3	9.2	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	10.7	0.4	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	215	101	200	405	165	255	280	175	120	225	75
Future Volume (vph)	15	215	101	200	405	165	255	280	175	120	225	75
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1540	1593	3539	1549	1593	3312		1593	3390	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1540	1593	3539	1549	1593	3312		1593	3390	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	17	244	115	227	460	188	290	318	199	136	256	85
RTOR Reduction (vph)	0	0	93	0	0	111	0	90	0	0	33	0
Lane Group Flow (vph)	17	244	22	227	460	77	290	427	0	136	308	0
Confl. Peds. (#/hr)			1			9			4			6
Confl. Bikes (#/hr)			3			3			2			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.5	17.6	17.6	23.1	38.2	38.2	19.4	23.7		12.4	16.7	
Effective Green, g (s)	2.5	17.6	17.6	23.1	38.2	38.2	19.4	23.7		12.4	16.7	
Actuated g/C Ratio	0.03	0.19	0.19	0.25	0.41	0.41	0.21	0.25		0.13	0.18	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	42	664	288	392	1441	630	329	836		210	603	
v/s Ratio Prot	0.01	c0.07		c0.14	0.13		c0.18	c0.13		0.09	0.09	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.40	0.37	0.07	0.58	0.32	0.12	0.88	0.51		0.65	0.51	
Uniform Delay, d1	44.9	33.2	31.4	31.1	18.9	17.3	36.1	30.1		38.6	34.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.7	0.2	6.1	0.3	0.2	22.4	1.0		5.1	1.5	
Delay (s)	47.2	34.0	31.6	37.2	19.2	17.5	58.5	31.1		43.7	36.3	
Level of Service	D	C	C	D	B	B	E	C		D	D	
Approach Delay (s)		33.8			23.5			41.0			38.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	50	10	10	105	10	25	5	100	476	80	25	383
Future Volume (vph)	50	10	10	105	10	25	5	100	476	80	25	383
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.93		1.00	0.89			1.00	0.98		1.00	0.98
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1593	1723		1593	1664			1593	3463		1593	3464
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1593	1723		1593	1664			1593	3463		1593	3464
Peak-hour factor, PHF	0.91	0.92	0.91	0.92	0.92	0.92	0.91	0.91	0.91	0.92	0.92	0.91
Adj. Flow (vph)	55	11	11	114	11	27	5	110	523	87	27	421
RTOR Reduction (vph)	0	9	0	0	22	0	0	0	11	0	0	10
Lane Group Flow (vph)	55	13	0	114	16	0	0	115	599	0	27	471
Confl. Peds. (#/hr)												
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	4.5	7.9		7.8	11.2			7.6	21.6		2.5	16.5
Effective Green, g (s)	4.5	7.9		7.8	11.2			7.6	21.6		2.5	16.5
Actuated g/C Ratio	0.08	0.14		0.13	0.19			0.13	0.37		0.04	0.29
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	124	235		214	322			209	1294		68	988
v/s Ratio Prot	0.03	0.01		c0.07	c0.01			c0.07	c0.17		0.02	0.14
v/s Ratio Perm												
v/c Ratio	0.44	0.05		0.53	0.05			0.55	0.46		0.40	0.48
Uniform Delay, d1	25.5	21.7		23.3	19.0			23.5	13.7		26.9	17.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.5	0.1		2.5	0.1			3.1	0.3		3.8	0.4
Delay (s)	28.0	21.8		25.8	19.0			26.6	14.0		30.7	17.4
Level of Service	C	C		C	B			C	B		C	B
Approach Delay (s)		26.2			24.1				16.0			18.1
Approach LOS		C			C				B			B

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	55
Future Volume (vph)	55
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	60
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

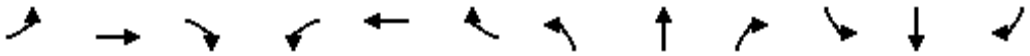
Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	65	486	10	40	353
Future Vol, veh/h	30	65	486	10	40	353
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	34	74	552	11	45	401

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	849	282	0	0	564	0
Stage 1	558	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.88	6.98	-	-	4.18	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.34	-	-	2.24	-
Pot Cap-1 Maneuver	296	709	-	-	990	-
Stage 1	531	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	279	709	-	-	990	-
Mov Cap-2 Maneuver	397	-	-	-	-	-
Stage 1	531	-	-	-	-	-
Stage 2	685	-	-	-	-	-

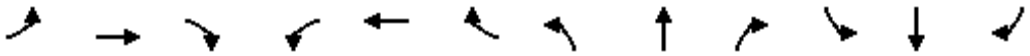
Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	568	990	-
HCM Lane V/C Ratio	-	-	0.19	0.046	-
HCM Control Delay (s)	-	-	12.8	8.8	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	8	70	15	23	20	110	516	10	15	288	153
Future Volume (vph)	132	8	70	15	23	20	110	516	10	15	288	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.95		1.00	1.00		1.00	0.95	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715			1753		1593	3528		1593	3321	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1715			1753		1593	3528		1593	3321	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	150	9	80	17	26	23	125	586	11	17	327	174
RTOR Reduction (vph)	0	19	0	0	22	0	0	1	0	0	71	0
Lane Group Flow (vph)	0	220	0	0	44	0	125	596	0	17	430	0
Confl. Peds. (#/hr)			7						1			8
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		14.2			3.8		8.1	28.6		0.9	21.4	
Effective Green, g (s)		14.2			3.8		8.1	28.6		0.9	21.4	
Actuated g/C Ratio		0.22			0.06		0.13	0.45		0.01	0.33	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		380			104		201	1576		22	1110	
v/s Ratio Prot		c0.13			c0.03		c0.08	c0.17		0.01	0.13	
v/s Ratio Perm												
v/c Ratio		0.58			0.43		0.62	0.38		0.77	0.39	
Uniform Delay, d1		22.2			29.0		26.5	11.8		31.4	16.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3			1.0		4.3	0.3		87.1	0.5	
Delay (s)		23.6			30.1		30.8	12.1		118.6	16.7	
Level of Service		C			C		C	B		F	B	
Approach Delay (s)		23.6			30.1			15.3			20.1	
Approach LOS		C			C			B			C	

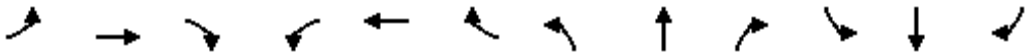
Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	65	55	45	0	10	35	716	60	190	583	55
Future Volume (vph)	70	65	55	45	0	10	35	716	60	190	583	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.91		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758			1588		1593	3489		1593	3481	
Flt Permitted		0.85			0.91		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1521			1500		1593	3489		1593	3481	
Peak-hour factor, PHF	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Adj. Flow (vph)	96	89	75	62	0	14	48	981	82	260	799	75
RTOR Reduction (vph)	0	10	0	0	73	0	0	5	0	0	5	0
Lane Group Flow (vph)	0	250	0	0	3	0	48	1058	0	260	869	0
Confl. Peds. (#/hr)						149			6			10
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		27.7			4.0		6.6	40.6		22.1	56.1	
Effective Green, g (s)		27.7			4.0		6.6	40.6		22.1	56.1	
Actuated g/C Ratio		0.25			0.04		0.06	0.37		0.20	0.51	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		379			54		94	1277		317	1760	
v/s Ratio Prot							0.03	c0.30		c0.16	0.25	
v/s Ratio Perm		c0.16			c0.00							
v/c Ratio		0.66			0.05		0.51	0.83		0.82	0.49	
Uniform Delay, d1		37.4			51.6		50.6	32.0		42.5	18.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.3			0.1		1.9	5.5		14.8	0.7	
Delay (s)		40.7			51.8		52.5	37.5		57.3	18.7	
Level of Service		D			D		D	D		E	B	
Approach Delay (s)		40.7			51.8			38.1			27.6	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	270	130	239	455	210	230	608	193	115	409	110
Future Volume (vph)	130	270	130	239	455	210	230	608	193	115	409	110
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1526	1593	3539	1530	1593	3383		1593	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1526	1593	3539	1530	1593	3383		1593	3410	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	144	300	144	266	506	233	256	676	214	128	454	122
RTOR Reduction (vph)	0	0	97	0	0	129	0	20	0	0	18	0
Lane Group Flow (vph)	144	300	47	266	506	104	256	870	0	128	558	0
Confl. Peds. (#/hr)			24			21			19			8
Confl. Bikes (#/hr)			1			2			2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	9.9	24.2	24.2	22.6	36.9	36.9	17.2	31.7		13.6	27.8	
Effective Green, g (s)	9.9	24.2	24.2	22.6	36.9	36.9	17.2	31.7		13.6	27.8	
Actuated g/C Ratio	0.09	0.22	0.22	0.21	0.34	0.34	0.16	0.29		0.13	0.26	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	282	790	340	332	1205	521	252	990		200	875	
v/s Ratio Prot	0.05	0.08		c0.17	c0.14		c0.16	c0.26		0.08	0.16	
v/s Ratio Perm			0.03			0.07						
v/c Ratio	0.51	0.38	0.14	0.80	0.42	0.20	1.02	0.88		0.64	0.64	
Uniform Delay, d1	46.9	35.7	33.7	40.7	27.5	25.3	45.5	36.5		45.0	35.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.6	0.4	12.3	0.5	0.4	60.8	9.7		5.1	2.1	
Delay (s)	47.5	36.3	34.1	53.0	28.0	25.6	106.4	46.2		50.2	37.9	
Level of Service	D	D	C	D	C	C	F	D		D	D	
Approach Delay (s)		38.5			34.1			59.6			40.1	
Approach LOS		D			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	44.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	108.3	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	79.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	3	428	13	3	346
Future Vol, veh/h	30	3	428	13	3	346
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	3	465	14	3	376

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	855	472	0	0	479	0
Stage 1	472	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	329	592	-	-	1083	-
Stage 1	628	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	328	592	-	-	1083	-
Mov Cap-2 Maneuver	328	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	687	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	342	1083	-
HCM Lane V/C Ratio	-	-	0.105	0.003	-
HCM Control Delay (s)	-	-	16.8	8.3	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

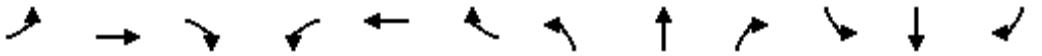
Intersection	
Int Delay, s/veh	5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	210	51	573	157	0	316
Future Vol, veh/h	210	51	573	157	0	316
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	55	623	171	0	343

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	881	397	0	0	-	-
Stage 1	709	-	-	-	-	-
Stage 2	172	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	286	602	-	-	0	-
Stage 1	449	-	-	-	0	-
Stage 2	841	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	286	602	-	-	-	-
Mov Cap-2 Maneuver	376	-	-	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	841	-	-	-	-	-

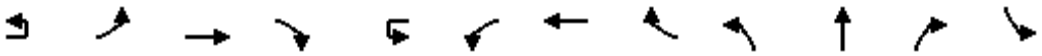
Approach	WB	NB	SB
HCM Control Delay, s	25	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBT
Capacity (veh/h)	-	-	376	602	-
HCM Lane V/C Ratio	-	-	0.607	0.092	-
HCM Control Delay (s)	-	-	28.3	11.6	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	3.8	0.3	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	83	65	523	73	224	35	420	377	338	705	9
Future Volume (vph)	10	83	65	523	73	224	35	420	377	338	705	9
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1562	3471	1533	3030	1588	1456	1562	3471	1544	3030	3471	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1562	3471	1533	3030	1588	1456	1562	3471	1544	3030	3471	1520
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	86	68	545	76	233	36	438	393	352	734	9
RTOR Reduction (vph)	0	0	57	0	0	0	0	0	158	0	0	6
Lane Group Flow (vph)	10	86	11	545	160	149	36	438	235	352	734	3
Confl. Peds. (#/hr)			1									1
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	18.4	18.4	18.4	28.4	28.4	28.4	6.0	23.6	52.0	18.4	36.0	36.0
Effective Green, g (s)	18.4	18.4	18.4	28.4	28.4	28.4	6.0	23.6	52.0	18.4	36.0	36.0
Actuated g/C Ratio	0.17	0.17	0.17	0.26	0.26	0.26	0.06	0.22	0.48	0.17	0.33	0.33
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	263	586	259	790	414	379	86	752	737	511	1147	502
v/s Ratio Prot	0.01	c0.02		c0.18	0.10		0.02	0.13	0.08	c0.12	c0.21	
v/s Ratio Perm			0.01			0.10			0.07			0.00
v/c Ratio	0.04	0.15	0.04	0.69	0.39	0.39	0.42	0.58	0.32	0.69	0.64	0.01
Uniform Delay, d1	37.8	38.6	37.9	36.3	33.1	33.2	49.8	38.2	17.5	42.6	30.9	24.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.1	2.5	0.6	0.7	3.3	1.8	0.3	3.9	1.6	0.0
Delay (s)	37.9	38.7	38.0	38.8	33.7	33.8	53.0	40.0	17.8	46.4	32.6	24.5
Level of Service	D	D	D	D	C	C	D	D	B	D	C	C
Approach Delay (s)		38.3			37.0			30.5			37.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	108.9	Sum of lost time (s)	20.1
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	15	45	603	85	5	494	660	43	70	50	394	88
Future Volume (vph)	15	45	603	85	5	494	660	43	70	50	394	88
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1900	1900	1710
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	16	49	663	93	5	543	725	47	77	55	433	97
RTOR Reduction (vph)	0	0	0	67	0	0	0	21	0	0	390	0
Lane Group Flow (vph)	0	65	663	26	0	548	725	26	77	55	43	97
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2				6			3	
Actuated Green, G (s)		7.4	30.4	30.4		37.0	60.0	60.0	10.7	10.7	10.7	11.2
Effective Green, g (s)		7.4	30.4	30.4		37.0	60.0	60.0	10.7	10.7	10.7	11.2
Actuated g/C Ratio		0.07	0.28	0.28		0.35	0.56	0.56	0.10	0.10	0.10	0.10
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		108	988	442		541	1950	854	156	183	155	163
v/s Ratio Prot		0.04	c0.19			c0.35	0.21		c0.05	0.03		c0.06
v/s Ratio Perm				0.02				0.02			0.03	
v/c Ratio		0.60	0.67	0.06		1.01	0.37	0.03	0.49	0.30	0.28	0.60
Uniform Delay, d1		48.3	33.8	27.8		34.9	13.0	10.4	45.5	44.6	44.5	45.6
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.3	3.6	0.2		42.0	0.5	0.1	0.9	0.3	0.4	3.8
Delay (s)		54.6	37.4	28.0		76.9	13.5	10.5	46.4	44.9	44.8	49.5
Level of Service		D	D	C		E	B	B	D	D	D	D
Approach Delay (s)			37.7				39.7			45.1		
Approach LOS			D				D			D		

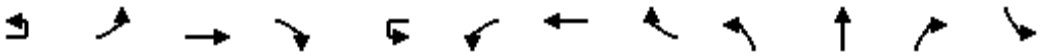
Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	106.8	Sum of lost time (s)	17.5
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	65	40
Future Volume (vph)	65	40
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.94	
Flt Protected	1.00	
Satd. Flow (prot)	1722	
Flt Permitted	1.00	
Satd. Flow (perm)	1722	
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	71	44
RTOR Reduction (vph)	17	0
Lane Group Flow (vph)	98	0
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	11.2	
Effective Green, g (s)	11.2	
Actuated g/C Ratio	0.10	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	180	
v/s Ratio Prot	0.06	
v/s Ratio Perm		
v/c Ratio	0.54	
Uniform Delay, d1	45.4	
Progression Factor	1.00	
Incremental Delay, d2	1.8	
Delay (s)	47.2	
Level of Service	D	
Approach Delay (s)	48.2	
Approach LOS	D	

Intersection Summary



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	40	980	5	5	5	1092	216	10	15	10	341
Future Volume (vph)	5	40	980	5	5	5	1092	216	10	15	10	341
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		0.96		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (prot)		1577	3502			1577	3505	1533		1743		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (perm)		1577	3502			1577	3505	1533		1743		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	44	1089	6	6	6	1213	240	11	17	11	379
RTOR Reduction (vph)	0	0	0	0	0	0	0	146	0	10	0	0
Lane Group Flow (vph)	0	50	1095	0	0	12	1213	94	0	29	0	0
Confl. Peds. (#/hr)								1			1	
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.7	41.5			1.0	37.4	37.4		8.0		
Effective Green, g (s)		4.7	41.5			1.0	37.4	37.4		8.0		
Actuated g/C Ratio		0.05	0.44			0.01	0.39	0.39		0.08		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		77	1528			16	1378	602		146		
v/s Ratio Prot		c0.03	0.31			0.01	c0.35			c0.02		
v/s Ratio Perm								0.06				
v/c Ratio		0.65	0.72			0.75	0.88	0.16		0.20		
Uniform Delay, d1		44.4	22.0			46.9	26.8	18.7		40.6		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		13.3	2.9			97.6	8.1	0.5		0.2		
Delay (s)		57.6	24.9			144.5	34.9	19.1		40.8		
Level of Service		E	C			F	C	B		D		
Approach Delay (s)			26.3				33.2			40.8		
Approach LOS			C				C			D		

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	5	35
Future Volume (vph)	5	35
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	0.96	
Satd. Flow (prot)	1737	
Flt Permitted	0.96	
Satd. Flow (perm)	1737	
Peak-hour factor, PHF	0.90	0.90
Adj. Flow (vph)	6	39
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	421	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	33%	3%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	26.8	
Effective Green, g (s)	26.8	
Actuated g/C Ratio	0.28	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	489	
v/s Ratio Prot	c0.24	
v/s Ratio Perm		
v/c Ratio	0.86	
Uniform Delay, d1	32.4	
Progression Factor	1.00	
Incremental Delay, d2	14.0	
Delay (s)	46.3	
Level of Service	D	
Approach Delay (s)	46.3	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	20	1321	5	5	20	1318	53	10	0	15	28
Future Volume (vph)	5	20	1321	5	5	20	1318	53	10	0	15	28
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1547	3436			1547	3414			1616		
Flt Permitted		0.95	1.00			0.95	1.00			0.90		
Satd. Flow (perm)		1547	3436			1547	3414			1477		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	21	1362	5	5	21	1359	55	10	0	15	29
RTOR Reduction (vph)	0	0	0	0	0	0	2	0	0	24	0	0
Lane Group Flow (vph)	0	26	1367	0	0	26	1412	0	0	1	0	0
Confl. Peds. (#/hr)				1				4			4	
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		3.4	68.0			3.0	67.6			5.3		
Effective Green, g (s)		3.4	68.0			3.0	67.6			5.3		
Actuated g/C Ratio		0.04	0.76			0.03	0.75			0.06		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		3.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		58	2596			51	2564			86		
v/s Ratio Prot		c0.02	0.40			0.02	c0.41					
v/s Ratio Perm										0.00		
v/c Ratio		0.45	0.53			0.51	0.55			0.02		
Uniform Delay, d1		42.4	4.5			42.8	4.8			39.9		
Progression Factor		1.00	1.00			1.00	1.75			1.00		
Incremental Delay, d2		5.4	0.8			1.8	0.5			0.0		
Delay (s)		47.8	5.2			44.4	8.8			39.9		
Level of Service		D	A			D	A			D		
Approach Delay (s)			6.0				9.5			39.9		
Approach LOS			A				A			D		

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	15
Future Volume (vph)	0	15
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1664	
Flt Permitted	0.79	
Satd. Flow (perm)	1351	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	0	15
RTOR Reduction (vph)	41	0
Lane Group Flow (vph)	3	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	5%	5%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	5.3	
Effective Green, g (s)	5.3	
Actuated g/C Ratio	0.06	
Clearance Time (s)	4.5	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	79	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.03	
Uniform Delay, d1	39.9	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	40.1	
Level of Service	D	
Approach Delay (s)	40.1	
Approach LOS	D	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	208	1052	25	21	15	1053	306	25	15	25	756	20
Future Volume (vph)	208	1052	25	21	15	1053	306	25	15	25	756	20
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (prot)	1577	3491			1577	3505	1568		1788	1568	1498	1673
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (perm)	1577	3491			1577	3505	1568		1788	1568	1498	1673
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	214	1085	26	22	15	1086	315	26	15	26	779	21
RTOR Reduction (vph)	0	2	0	0	0	0	205	0	0	25	0	0
Lane Group Flow (vph)	214	1109	0	0	37	1086	110	0	41	1	397	403
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	16.1	44.8			3.7	31.4	31.4		4.4	4.4	20.4	20.4
Effective Green, g (s)	16.1	44.8			3.7	31.4	31.4		4.4	4.4	20.4	20.4
Actuated g/C Ratio	0.18	0.50			0.04	0.35	0.35		0.05	0.05	0.23	0.23
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	282	1737			64	1222	547		87	76	339	379
v/s Ratio Prot	c0.14	0.32			0.02	c0.31			c0.02		c0.26	0.24
v/s Ratio Perm							0.07			0.00		
v/c Ratio	0.76	0.64			0.58	0.89	0.20		0.47	0.02	1.17	1.06
Uniform Delay, d1	35.1	16.6			42.4	27.7	20.5		41.7	40.7	34.8	34.8
Progression Factor	1.14	0.70			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	9.0	1.6			7.6	9.8	0.8		1.5	0.0	103.9	64.0
Delay (s)	49.1	13.3			50.0	37.5	21.3		43.1	40.8	138.7	98.8
Level of Service	D	B			D	D	C		D	D	F	F
Approach Delay (s)		19.1				34.3			42.2			96.0
Approach LOS		B				C			D			F

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	265
Future Volume (vph)	265
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	273
RTOR Reduction (vph)	135
Lane Group Flow (vph)	138
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	20.4
Effective Green, g (s)	20.4
Actuated g/C Ratio	0.23
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	355
v/s Ratio Prot	
v/s Ratio Perm	0.09
v/c Ratio	0.39
Uniform Delay, d1	29.5
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	29.8
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

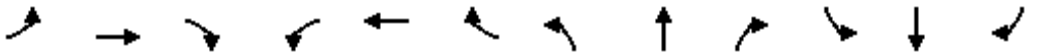
Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1872	20	5	1282	238	0	0	30	0	0	65
Future Vol, veh/h	0	1872	20	5	1282	238	0	0	30	0	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2035	22	5	1393	259	0	0	33	0	0	71

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	2057	0	0	-	-	1028	-	-	826
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	5.34	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.12	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	117	-	-	0	0	199	0	0	271
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	117	-	-	-	-	199	-	-	271
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	26.6	22.9
HCM LOS			D	C

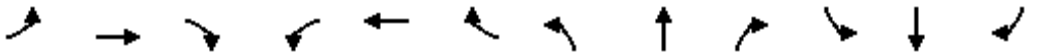
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	199	-	-	117	-	-	271
HCM Lane V/C Ratio	0.164	-	-	0.046	-	-	0.261
HCM Control Delay (s)	26.6	-	-	37.3	-	-	22.9
HCM Lane LOS	D	-	-	E	-	-	C
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-	-	1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1254	590	300	893	0	0	0	0	280	0	632
Future Volume (vph)	0	1254	590	300	893	0	0	0	0	280	0	632
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6346	1532	1577	3505						1752	1568
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6346	1532	1577	3505						1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1334	628	319	950	0	0	0	0	298	0	672
RTOR Reduction (vph)	0	0	342	0	0	0	0	0	0	0	0	157
Lane Group Flow (vph)	0	1334	286	319	950	0	0	0	0	0	298	515
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		31.8	31.8	19.0	55.0						15.5	15.5
Effective Green, g (s)		31.8	31.8	19.0	55.0						15.5	15.5
Actuated g/C Ratio		0.40	0.40	0.24	0.69						0.19	0.19
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2516	607	373	2403						338	303
v/s Ratio Prot		c0.21		c0.20	0.27						0.17	
v/s Ratio Perm			0.19									c0.33
v/c Ratio		0.53	0.47	0.86	0.40						0.88	1.70
Uniform Delay, d1		18.5	18.0	29.3	5.4						31.5	32.4
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.8	16.6	0.1						22.4	329.4
Delay (s)		18.8	18.8	45.9	5.6						53.9	361.7
Level of Service		B	B	D	A						D	F
Approach Delay (s)		18.8			15.7			0.0			267.2	
Approach LOS		B			B			A			F	

Intersection Summary					
HCM 2000 Control Delay	75.2	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	80.2	Sum of lost time (s)		13.9	
Intersection Capacity Utilization	82.3%	ICU Level of Service		E	
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	665	874	0	0	822	285	371	5	250	0	0	0
Future Volume (vph)	665	874	0	0	822	285	371	5	250	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1758	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1758	1568			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	700	920	0	0	865	300	391	5	263	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	133	0	0	114	0	0	0
Lane Group Flow (vph)	700	920	0	0	865	167	0	396	149	0	0	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	23.7	57.2			29.3	29.3		23.1	23.1			
Effective Green, g (s)	23.7	57.2			29.3	29.3		23.1	23.1			
Actuated g/C Ratio	0.26	0.64			0.33	0.33		0.26	0.26			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	805	2227			1141	510		451	402			
v/s Ratio Prot	c0.23	0.26			c0.25			c0.23				
v/s Ratio Perm						0.11			0.10			
v/c Ratio	0.87	0.41			0.76	0.33		0.88	0.37			
Uniform Delay, d1	31.7	8.1			27.2	22.9		32.1	27.5			
Progression Factor	1.00	1.00			1.17	1.64		1.00	1.00			
Incremental Delay, d2	9.6	0.6			3.9	1.4		17.4	0.6			
Delay (s)	41.3	8.7			35.8	38.9		49.5	28.1			
Level of Service	D	A			D	D		D	C			
Approach Delay (s)		22.8			36.6			41.0			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	403	631	80	35	499	130	125	10	25	145	15
Future Volume (vph)	15	403	631	80	35	499	130	125	10	25	145	15
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3060	3505	1568	1577	3386			1763	1534		1765
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3060	3505	1568	1577	3386			1763	1534		1765
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	429	671	85	37	531	138	133	11	27	154	16
RTOR Reduction (vph)	0	0	0	42	0	18	0	0	0	23	0	0
Lane Group Flow (vph)	0	445	671	43	37	651	0	0	144	4	0	170
Confl. Peds. (#/hr)							3			9		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		15.5	45.9	45.9	3.4	32.9			12.1	12.1		11.4
Effective Green, g (s)		15.5	45.9	45.9	3.4	32.9			12.1	12.1		11.4
Actuated g/C Ratio		0.17	0.51	0.51	0.04	0.37			0.13	0.13		0.13
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		527	1787	799	59	1237			237	206		223
v/s Ratio Prot		c0.15	0.19		0.02	c0.19			c0.08			c0.10
v/s Ratio Perm				0.03						0.00		
v/c Ratio		0.84	0.38	0.05	0.63	0.53			0.61	0.02		0.76
Uniform Delay, d1		36.1	13.4	11.1	42.7	22.4			36.7	33.8		38.0
Progression Factor		0.89	1.13	2.41	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		10.6	0.6	0.1	14.0	1.6			3.0	0.0		12.9
Delay (s)		42.7	15.7	26.9	56.7	24.0			39.7	33.8		50.9
Level of Service		D	B	C	E	C			D	C		D
Approach Delay (s)			26.5			25.7			38.8			39.8
Approach LOS			C			C			D			D

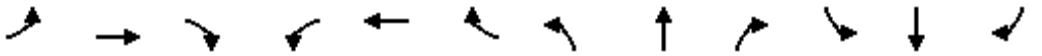
Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	483
Future Volume (vph)	483
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	514
RTOR Reduction (vph)	449
Lane Group Flow (vph)	65
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	11.4
Effective Green, g (s)	11.4
Actuated g/C Ratio	0.13
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	198
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.33
Uniform Delay, d1	35.8
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	36.2
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	691	5	5	559	30	10	5	5	25	0	95
Future Volume (Veh/h)	105	691	5	5	559	30	10	5	5	25	0	95
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	111	727	5	5	588	32	11	5	5	26	0	100
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	620			732			1356	1582	730	1574	1568	310
vC1, stage 1 conf vol							952	952		614	614	
vC2, stage 2 conf vol							404	630		960	954	
vCu, unblocked vol	620			579			1327	1598	577	1589	1582	310
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	88			99			95	98	99	87	100	85
cM capacity (veh/h)	950			820			208	225	381	197	239	683

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	843	299	326	21	26	100
Volume Left	111	5	0	11	26	0
Volume Right	5	0	32	5	0	100
cSH	950	820	1700	238	197	683
Volume to Capacity	0.12	0.01	0.19	0.09	0.13	0.15
Queue Length 95th (ft)	10	0	0	7	11	13
Control Delay (s)	2.9	0.2	0.0	21.6	26.0	11.2
Lane LOS	A	A		C	D	B
Approach Delay (s)	2.9	0.1		21.6	14.2	
Approach LOS				C	B	

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	77.0%	ICU Level of Service		D
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	631	25	5	524	60	10
Future Vol, veh/h	631	25	5	524	60	10
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	664	26	5	552	63	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	692	0	1240	678
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	562	-
Critical Hdwy	-	-	4.14	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.236	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	894	-	192	449
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	894	-	190	449
Mov Cap-2 Maneuver	-	-	-	-	190	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	562	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	31.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	207	-	-	894	-
HCM Lane V/C Ratio	0.356	-	-	0.006	-
HCM Control Delay (s)	31.7	-	-	9.1	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	621	10	5	524	5	5	0	5	5	0	5
Future Vol, veh/h	15	621	10	5	524	5	5	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	654	11	5	552	5	5	0	5	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	557	0	0	664	0	0	1258	1258	659	1258	1261	554
Stage 1	-	-	-	-	-	-	691	691	-	565	565	-
Stage 2	-	-	-	-	-	-	567	567	-	693	696	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1014	-	-	925	-	-	148	171	464	148	170	532
Stage 1	-	-	-	-	-	-	435	446	-	510	508	-
Stage 2	-	-	-	-	-	-	508	507	-	434	443	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1014	-	-	925	-	-	143	165	464	143	164	532
Mov Cap-2 Maneuver	-	-	-	-	-	-	143	165	-	143	164	-
Stage 1	-	-	-	-	-	-	424	435	-	497	504	-
Stage 2	-	-	-	-	-	-	499	503	-	418	432	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	22.3	21.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	219	1014	-	-	925	-	-	225
HCM Lane V/C Ratio	0.048	0.016	-	-	0.006	-	-	0.047
HCM Control Delay (s)	22.3	8.6	0	-	8.9	0	-	21.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	15.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	198	428	377	60	75	157
Future Vol, veh/h	198	428	377	60	75	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	220	476	419	67	83	174

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	486	0	-	0	1368	452
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	916	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1077	-	-	-	162	608
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1077	-	-	-	129	608
Mov Cap-2 Maneuver	-	-	-	-	129	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	310	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	78.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1077	-	-	-	276
HCM Lane V/C Ratio	0.204	-	-	-	0.934
HCM Control Delay (s)	9.2	-	-	-	78.7
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.8	-	-	-	8.8

Intersection	
Int Delay, s/veh	11.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	360	163	128	45	40	289
Future Vol, veh/h	360	163	128	45	40	289
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	414	187	147	52	46	332

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	199	0	-	0	1188	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	1015	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1373	-	-	-	208	871
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1373	-	-	-	145	871
Mov Cap-2 Maneuver	-	-	-	-	145	-
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	244	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	25.7
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1373	-	-	-	541
HCM Lane V/C Ratio	0.301	-	-	-	0.699
HCM Control Delay (s)	8.7	-	-	-	25.7
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	1.3	-	-	-	5.5

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	51	314	308	25	20	41
Future Vol, veh/h	51	314	308	25	20	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	324	318	26	21	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	343	0	-	0	759	330
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1216	-	-	-	374	712
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	657	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1216	-	-	-	354	712
Mov Cap-2 Maneuver	-	-	-	-	354	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	622	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1216	-	-	-	535
HCM Lane V/C Ratio	0.043	-	-	-	0.118
HCM Control Delay (s)	8.1	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

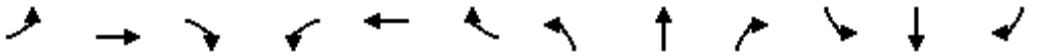
Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	106	193	252	55	45	86
Future Vol, veh/h	106	193	252	55	45	86
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	201	263	57	47	90

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	263	0	-	0	685	263
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	422	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1301	-	-	-	414	776
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1301	-	-	-	379	776
Mov Cap-2 Maneuver	-	-	-	-	379	-
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1301	-	-	-	571
HCM Lane V/C Ratio	0.085	-	-	-	0.239
HCM Control Delay (s)	8	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	5	65	15	15	20	140	400	15	15	420	177
Future Volume (vph)	128	5	65	15	15	20	140	400	15	15	420	177
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1604		1593	1702		1593	1853		1593	1863	1550
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1604		1593	1702		1593	1853		1593	1863	1550
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	149	6	76	17	17	23	163	465	17	17	488	206
RTOR Reduction (vph)	0	65	0	0	22	0	0	1	0	0	0	113
Lane Group Flow (vph)	149	17	0	17	18	0	163	481	0	17	488	93
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	6.6	9.1		0.9	3.4		7.6	36.1		0.9	29.4	29.4
Effective Green, g (s)	6.6	9.1		0.9	3.4		7.6	36.1		0.9	29.4	29.4
Actuated g/C Ratio	0.10	0.14		0.01	0.05		0.12	0.56		0.01	0.45	0.45
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	224		22	89		186	1029		22	842	701
v/s Ratio Prot	c0.09	0.01		0.01	c0.01		c0.10	0.26		0.01	c0.26	
v/s Ratio Perm												0.06
v/c Ratio	0.93	0.07		0.77	0.20		0.88	0.47		0.77	0.58	0.13
Uniform Delay, d1	29.0	24.3		31.9	29.5		28.2	8.7		31.9	13.2	10.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.1	0.1		93.0	1.1		33.8	0.3		93.0	1.0	0.1
Delay (s)	78.1	24.4		124.9	30.6		62.0	9.0		124.9	14.2	10.5
Level of Service	E	C		F	C		E	A		F	B	B
Approach Delay (s)		59.0			58.8			22.4			15.8	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	50	0	60	429	0	20	58	15	293	160	71	491
Future Volume (vph)	50	0	60	429	0	20	58	15	293	160	71	491
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3521
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3521
Peak-hour factor, PHF	0.87	0.92	0.87	0.92	0.92	0.92	0.92	0.87	0.87	0.92	0.92	0.87
Adj. Flow (vph)	57	0	69	466	0	22	63	17	337	174	77	564
RTOR Reduction (vph)	0	0	64	0	0	17	0	0	0	121	0	2
Lane Group Flow (vph)	0	57	5	233	233	5	0	80	337	53	77	579
Confl. Peds. (#/hr)												
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		5.4	5.4	17.1	17.1	17.1		6.5	20.7	20.7	6.6	20.8
Effective Green, g (s)		5.4	5.4	17.1	17.1	17.1		6.5	20.7	20.7	6.6	20.8
Actuated g/C Ratio		0.08	0.08	0.25	0.25	0.25		0.09	0.30	0.30	0.10	0.30
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		139	124	377	419	394		150	562	477	153	1067
v/s Ratio Prot		c0.03		c0.15	0.14			c0.05	c0.18		0.05	0.16
v/s Ratio Perm			0.00			0.00				0.03		
v/c Ratio		0.41	0.04	0.62	0.56	0.01		0.53	0.60	0.11	0.50	0.54
Uniform Delay, d1		30.1	29.2	22.9	22.4	19.4		29.6	20.4	17.3	29.4	19.9
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7	0.1	3.0	1.6	0.0		1.8	2.5	0.2	2.6	1.0
Delay (s)		30.8	29.3	25.9	24.0	19.4		31.4	23.0	17.5	32.0	20.9
Level of Service		C	C	C	C	B		C	C	B	C	C
Approach Delay (s)		30.0			24.7				22.5			22.2
Approach LOS		C			C				C			C

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	18.8
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	15
Future Volume (vph)	15
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.87
Adj. Flow (vph)	17
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	10	344	15	5	504
Future Vol, veh/h	15	10	344	15	5	504
Conflicting Peds, #/hr	0	1	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	12	425	19	6	622

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1070	436	0	0	444	0
Stage 1	435	-	-	-	-	-
Stage 2	635	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	245	620	-	-	1116	-
Stage 1	653	-	-	-	-	-
Stage 2	528	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	243	619	-	-	1115	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	524	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	444	1115	-
HCM Lane V/C Ratio	-	-	0.07	0.006	-
HCM Control Delay (s)	-	-	13.7	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	30	341	23	45	511
Future Vol, veh/h	18	30	341	23	45	511
Conflicting Peds, #/hr	0	2	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	35	401	27	53	601

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1124	419	0	0	430	0
Stage 1	417	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	227	634	-	-	1129	-
Stage 1	665	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	210	632	-	-	1127	-
Mov Cap-2 Maneuver	337	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	454	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	476	1127	-
HCM Lane V/C Ratio	-	-	0.119	0.047	-
HCM Control Delay (s)	-	-	13.6	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

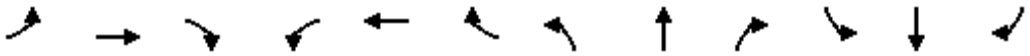
Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	5	64	5	35	5	332	44	75	537	20
Future Vol, veh/h	10	5	5	64	5	35	5	332	44	75	537	20
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	6	6	74	6	41	6	386	51	87	624	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1261	1263	640	1243	1249	416	650	0	0	439	0	0
Stage 1	812	812	-	425	425	-	-	-	-	-	-	-
Stage 2	449	451	-	818	824	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	170	475	151	173	637	936	-	-	1121	-	-
Stage 1	373	392	-	607	586	-	-	-	-	-	-	-
Stage 2	589	571	-	370	387	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	120	147	473	130	150	635	934	-	-	1119	-	-
Mov Cap-2 Maneuver	120	147	-	130	150	-	-	-	-	-	-	-
Stage 1	369	344	-	600	580	-	-	-	-	-	-	-
Stage 2	540	565	-	315	339	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.1	59.1	0.1	1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	934	-	-	156	179	1119	-	-
HCM Lane V/C Ratio	0.006	-	-	0.149	0.676	0.078	-	-
HCM Control Delay (s)	8.9	0	-	32.1	59.1	8.5	0	-
HCM Lane LOS	A	A	-	D	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	4	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	370	276	245	300	110	141	260	170	160	275	45
Future Volume (vph)	45	370	276	245	300	110	141	260	170	160	275	45
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1557	1593	3539	1563	1593	3310		1593	3457	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1557	1593	3539	1563	1593	3310		1593	3457	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	411	307	272	333	122	157	289	189	178	306	50
RTOR Reduction (vph)	0	0	235	0	0	75	0	108	0	0	13	0
Lane Group Flow (vph)	50	411	72	272	333	47	157	370	0	178	343	0
Confl. Peds. (#/hr)			3						2			2
Confl. Bikes (#/hr)			2			2			1			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.8	20.2	20.2	18.0	33.4	33.4	13.1	17.6		13.9	18.4	
Effective Green, g (s)	4.8	20.2	20.2	18.0	33.4	33.4	13.1	17.6		13.9	18.4	
Actuated g/C Ratio	0.06	0.23	0.23	0.21	0.39	0.39	0.15	0.20		0.16	0.21	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	88	824	362	330	1363	602	240	671		255	733	
v/s Ratio Prot	0.03	c0.12		c0.17	0.09		0.10	c0.11		c0.11	0.10	
v/s Ratio Perm			0.05			0.03						
v/c Ratio	0.57	0.50	0.20	0.82	0.24	0.08	0.65	0.55		0.70	0.47	
Uniform Delay, d1	39.9	28.9	26.7	32.8	18.1	16.9	34.7	31.0		34.4	29.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	1.0	0.6	14.6	0.2	0.1	4.8	1.7		6.6	1.0	
Delay (s)	44.9	29.9	27.3	47.4	18.3	17.0	39.5	32.7		41.0	30.9	
Level of Service	D	C	C	D	B	B	D	C		D	C	
Approach Delay (s)		29.8			29.0			34.4			34.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	45	30	15	190	30	50	5	90	418	165	40	523
Future Volume (vph)	45	30	15	190	30	50	5	90	418	165	40	523
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frt	1.00	0.95		1.00	0.91			1.00	0.96		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1593	1772		1593	1689			1593	3389		1593	3497
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1593	1772		1593	1689			1593	3389		1593	3497
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	33	16	207	33	54	5	98	454	179	43	568
RTOR Reduction (vph)	0	14	0	0	38	0	0	0	38	0	0	6
Lane Group Flow (vph)	49	35	0	207	49	0	0	103	595	0	43	611
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	4.6	9.9		15.1	20.4			8.0	23.3		4.5	19.8
Effective Green, g (s)	4.6	9.9		15.1	20.4			8.0	23.3		4.5	19.8
Actuated g/C Ratio	0.06	0.14		0.21	0.29			0.11	0.33		0.06	0.28
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	103	247		339	486			180	1115		101	977
v/s Ratio Prot	0.03	c0.02		c0.13	0.03			c0.06	c0.18		0.03	c0.17
v/s Ratio Perm												
v/c Ratio	0.48	0.14		0.61	0.10			0.57	0.53		0.43	0.63
Uniform Delay, d1	31.9	26.7		25.2	18.5			29.8	19.3		31.9	22.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.3		3.2	0.1			4.3	0.5		2.9	1.3
Delay (s)	35.4	27.0		28.4	18.6			34.1	19.8		34.8	23.5
Level of Service	D	C		C	B			C	B		C	C
Approach Delay (s)		31.2			25.5				21.8			24.3
Approach LOS		C			C				C			C

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	70.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	49
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

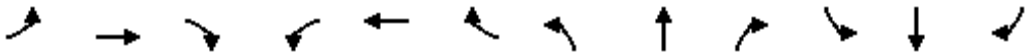
Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	25	418	10	55	518
Future Vol, veh/h	10	25	418	10	55	518
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	27	459	11	60	569

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	870	235	0	0	470	0
Stage 1	465	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	291	767	-	-	1088	-
Stage 1	599	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	267	767	-	-	1088	-
Mov Cap-2 Maneuver	393	-	-	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	590	-	-	-	-	-

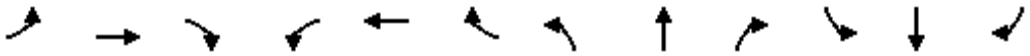
Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	603	1088	-
HCM Lane V/C Ratio	-	-	0.064	0.056	-
HCM Control Delay (s)	-	-	11.4	8.5	0.3
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	13	65	5	13	20	40	393	15	25	533	93
Future Volume (vph)	78	13	65	5	13	20	40	393	15	25	533	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.93		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1689			1684		1577	3483		1577	3414	
Flt Permitted		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1689			1684		1577	3483		1577	3414	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	84	14	70	5	14	22	43	423	16	27	573	100
RTOR Reduction (vph)	0	28	0	0	21	0	0	2	0	0	13	0
Lane Group Flow (vph)	0	140	0	0	20	0	43	437	0	27	660	0
Confl. Peds. (#/hr)			1						1			4
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		11.3			2.0		2.3	23.6		2.0	23.3	
Effective Green, g (s)		11.3			2.0		2.3	23.6		2.0	23.3	
Actuated g/C Ratio		0.20			0.04		0.04	0.43		0.04	0.42	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		344			60		65	1483		56	1435	
v/s Ratio Prot		c0.08			c0.01		c0.03	0.13		0.02	c0.19	
v/s Ratio Perm												
v/c Ratio		0.41			0.33		0.66	0.29		0.48	0.46	
Uniform Delay, d1		19.1			26.0		26.2	10.4		26.2	11.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			1.2		17.8	0.2		2.4	0.5	
Delay (s)		19.4			27.2		44.0	10.7		28.6	12.0	
Level of Service		B			C		D	B		C	B	
Approach Delay (s)		19.4			27.2			13.6			12.6	
Approach LOS		B			C			B			B	

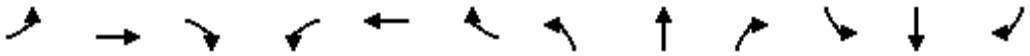
Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	25	15	0	5	25	633	5	25	718	35
Future Volume (vph)	30	0	25	15	0	5	25	633	5	25	718	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1690			1737		1593	3535		1593	3510	
Flt Permitted		0.82			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1423			1803		1593	3535		1593	3510	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	32	0	27	16	0	5	27	673	5	27	764	37
RTOR Reduction (vph)	0	53	0	0	21	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	6	0	0	0	0	27	678	0	27	799	0
Confl. Peds. (#/hr)			4						4			6
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		5.0			0.5		0.9	30.7		0.9	30.7	
Effective Green, g (s)		5.0			0.5		0.9	30.7		0.9	30.7	
Actuated g/C Ratio		0.09			0.01		0.02	0.57		0.02	0.57	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		132			16		26	2024		26	2010	
v/s Ratio Prot							c0.02	0.19		0.02	c0.23	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.04			0.01		1.04	0.33		1.04	0.40	
Uniform Delay, d1		22.1			26.3		26.4	6.1		26.4	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.1		188.7	0.3		188.7	0.4	
Delay (s)		22.2			26.4		215.1	6.4		215.1	6.7	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		22.2			26.4			14.4			13.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	455	105	234	395	270	105	409	189	355	559	145
Future Volume (vph)	170	455	105	234	395	270	105	409	189	355	559	145
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1543	1593	3539	1544	1593	3339		1593	3408	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1543	1593	3539	1544	1593	3339		1593	3408	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	479	111	246	416	284	111	431	199	374	588	153
RTOR Reduction (vph)	0	0	76	0	0	197	0	38	0	0	15	0
Lane Group Flow (vph)	179	479	35	246	416	87	111	592	0	374	726	0
Confl. Peds. (#/hr)			11			10			14			15
Confl. Bikes (#/hr)			2			3			2			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	11.6	25.6	25.6	22.7	36.7	36.7	12.4	27.7		27.0	42.0	
Effective Green, g (s)	11.6	25.6	25.6	22.7	36.7	36.7	12.4	27.7		27.0	42.0	
Actuated g/C Ratio	0.10	0.21	0.21	0.19	0.31	0.31	0.10	0.23		0.23	0.35	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	300	760	331	303	1089	475	165	775		360	1200	
v/s Ratio Prot	0.06	c0.14		c0.15	0.12		0.07	c0.18		c0.23	0.21	
v/s Ratio Perm			0.02			0.06						
v/c Ratio	0.60	0.63	0.11	0.81	0.38	0.18	0.67	0.76		1.04	0.61	
Uniform Delay, d1	51.6	42.5	37.6	46.2	32.4	30.3	51.4	42.7		46.1	31.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	2.4	0.3	14.4	0.5	0.4	8.2	5.3		57.9	1.3	
Delay (s)	53.7	44.9	37.9	60.6	32.8	30.7	59.6	48.0		104.0	33.1	
Level of Service	D	D	D	E	C	C	E	D		F	C	
Approach Delay (s)		45.9			39.4			49.8			56.8	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	48.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	6	358	15	6	507
Future Vol, veh/h	60	6	358	15	6	507
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	7	389	16	7	551

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	961	397	0	0	405	0
Stage 1	397	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	284	652	-	-	1154	-
Stage 1	679	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	282	652	-	-	1154	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	297	1154	-
HCM Lane V/C Ratio	-	-	0.242	0.006	-
HCM Control Delay (s)	-	-	20.9	8.1	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	230	26	367	144	0	816
Future Vol, veh/h	230	26	367	144	0	816
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	250	28	399	157	0	887

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	922	278	0	0	-	-
Stage 1	478	-	-	-	-	-
Stage 2	444	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	269	719	-	-	0	-
Stage 1	590	-	-	-	0	-
Stage 2	614	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	269	719	-	-	-	-
Mov Cap-2 Maneuver	397	-	-	-	-	-
Stage 1	590	-	-	-	-	-
Stage 2	614	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBT
Capacity (veh/h)	-	-	397	719	-
HCM Lane V/C Ratio	-	-	0.63	0.039	-
HCM Control Delay (s)	-	-	28.3	10.2	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	4.2	0.1	-

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	5	45	70	335	60	175	5	45	370	350	5
Future Volume (vph)	5	5	45	70	335	60	175	5	45	370	350	5
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710
Total Lost time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.92	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1593	3539	1562	3090	1636	1504		1593	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1593	3539	1562	3090	1636	1504		1593	3539	1583	
Peak-hour factor, PHF	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.97	0.97	0.97	0.92
Adj. Flow (vph)	5	5	46	72	345	62	180	5	46	381	361	5
RTOR Reduction (vph)	0	0	0	61	0	27	88	0	0	0	190	0
Lane Group Flow (vph)	0	10	46	11	345	98	29	0	51	381	171	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)				1								
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot
Protected Phases	8	8	8		7	7		1	1	6	7	5
Permitted Phases				8			7				6	
Actuated Green, G (s)		14.1	14.1	14.1	22.9	22.9	22.9		6.5	20.6	43.5	
Effective Green, g (s)		14.1	14.1	14.1	22.9	22.9	22.9		6.5	20.6	43.5	
Actuated g/C Ratio		0.15	0.15	0.15	0.25	0.25	0.25		0.07	0.22	0.47	
Clearance Time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	
Lane Grp Cap (vph)		244	542	239	769	407	374		112	792	748	
v/s Ratio Prot		0.01	c0.01		c0.11	0.06			0.03	c0.11	0.06	
v/s Ratio Perm				0.01			0.02				0.05	
v/c Ratio		0.04	0.08	0.05	0.45	0.24	0.08		0.46	0.48	0.23	
Uniform Delay, d1		33.2	33.4	33.2	29.2	27.6	26.5		41.1	31.1	14.3	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.1	0.1	0.4	0.3	0.1		2.9	1.0	0.2	
Delay (s)		33.3	33.5	33.3	29.6	27.9	26.6		44.0	32.0	14.5	
Level of Service		C	C	C	C	C	C		D	C	B	
Approach Delay (s)			33.4			28.7				24.8		
Approach LOS			C			C				C		

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	20.1
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	205	395	10
Future Volume (vph)	205	395	10
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.1	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3090	3539	1537
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3090	3539	1537
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	211	407	10
RTOR Reduction (vph)	0	0	7
Lane Group Flow (vph)	216	407	3
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	14.3	28.4	28.4
Effective Green, g (s)	14.3	28.4	28.4
Actuated g/C Ratio	0.16	0.31	0.31
Clearance Time (s)	4.1	6.5	6.5
Vehicle Extension (s)	3.0	5.0	5.0
Lane Grp Cap (vph)	480	1092	474
v/s Ratio Prot	c0.07	0.11	
v/s Ratio Perm			0.00
v/c Ratio	0.45	0.37	0.01
Uniform Delay, d1	35.3	24.8	22.0
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.4	0.0
Delay (s)	36.0	25.3	22.0
Level of Service	D	C	C
Approach Delay (s)		28.9	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	20	30	490	55	5	245	505	50	5	80	30	295
Future Volume (vph)	20	30	490	55	5	245	505	50	5	80	30	295
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1710	1900	1900
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00		1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1583	3505	1568		1577	3505	1568		1578	1845	1568
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1583	3505	1568		1577	3505	1568		1578	1845	1568
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Adj. Flow (vph)	22	33	538	60	5	269	555	55	5	88	33	324
RTOR Reduction (vph)	0	0	0	40	0	0	0	28	0	0	0	283
Lane Group Flow (vph)	0	55	538	20	0	274	555	27	0	93	33	41
Heavy Vehicles (%)	2%	3%	3%	3%	2%	3%	3%	3%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	Split	NA	Perm
Protected Phases	5	5	2		1	1	6		3	3	3	
Permitted Phases				2				6				3
Actuated Green, G (s)		6.2	26.3	26.3		19.5	39.6	39.6		10.1	10.1	10.1
Effective Green, g (s)		6.2	26.3	26.3		19.5	39.6	39.6		10.1	10.1	10.1
Actuated g/C Ratio		0.08	0.33	0.33		0.24	0.50	0.50		0.13	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0		2.0	2.0	2.0
Lane Grp Cap (vph)		123	1156	517		385	1741	779		199	233	198
v/s Ratio Prot		0.03	c0.15			c0.17	0.16			c0.06	0.02	
v/s Ratio Perm				0.01				0.02				0.03
v/c Ratio		0.45	0.47	0.04		0.71	0.32	0.04		0.47	0.14	0.21
Uniform Delay, d1		35.1	21.1	18.1		27.5	12.0	10.3		32.3	30.9	31.2
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.9	1.3	0.1		5.1	0.5	0.1		0.6	0.1	0.2
Delay (s)		36.1	22.4	18.2		32.6	12.4	10.3		32.9	31.0	31.4
Level of Service		D	C	B		C	B	B		C	C	C
Approach Delay (s)			23.2				18.6				31.7	
Approach LOS			C				B				C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	17.5
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

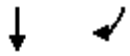


Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	50	35	20
Future Volume (vph)	50	35	20
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.5	4.5	
Lane Util. Factor	1.00	1.00	
Frt	1.00	0.94	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1577	1743	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1577	1743	
Peak-hour factor, PHF	0.91	0.91	0.91
Adj. Flow (vph)	55	38	22
RTOR Reduction (vph)	0	17	0
Lane Group Flow (vph)	55	43	0
Heavy Vehicles (%)	3%	3%	3%
Turn Type	Split	NA	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)	6.3	6.3	
Effective Green, g (s)	6.3	6.3	
Actuated g/C Ratio	0.08	0.08	
Clearance Time (s)	4.5	4.5	
Vehicle Extension (s)	2.0	2.0	
Lane Grp Cap (vph)	124	137	
v/s Ratio Prot	c0.03	0.02	
v/s Ratio Perm			
v/c Ratio	0.44	0.32	
Uniform Delay, d1	35.0	34.7	
Progression Factor	1.00	1.00	
Incremental Delay, d2	0.9	0.5	
Delay (s)	35.9	35.2	
Level of Service	D	D	
Approach Delay (s)		35.5	
Approach LOS		D	

Intersection Summary

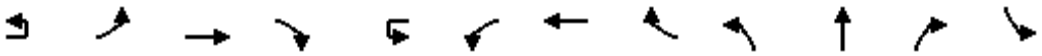
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	55	780	0	5	5	740	160	5	5	0	155
Future Volume (vph)	5	55	780	0	5	5	740	160	5	5	0	155
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		1.00		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (prot)		1593	3539			1593	3539	1550		1817		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (perm)		1593	3539			1593	3539	1550		1817		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	57	812	0	5	5	771	167	5	5	0	161
RTOR Reduction (vph)	0	0	0	0	0	0	0	94	0	0	0	0
Lane Group Flow (vph)	0	62	813	0	0	10	771	73	0	10	0	0
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		4.5	32.6			0.8	28.5	28.5		0.8		
Effective Green, g (s)		4.5	32.6			0.8	28.5	28.5		0.8		
Actuated g/C Ratio		0.07	0.50			0.01	0.44	0.44		0.01		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		109	1769			19	1546	677		22		
v/s Ratio Prot		c0.04	c0.23			0.01	0.22			c0.01		
v/s Ratio Perm								0.05				
v/c Ratio		0.57	0.46			0.53	0.50	0.11		0.45		
Uniform Delay, d1		29.4	10.6			32.0	13.2	10.8		32.0		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		4.0	0.8			11.6	1.0	0.3		5.3		
Delay (s)		33.4	11.4			43.6	14.2	11.1		37.3		
Level of Service		C	B			D	B	B		D		
Approach Delay (s)			12.9				13.9			37.3		
Approach LOS			B				B			D		

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	18.2
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



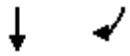
Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	55
Future Volume (vph)	10	55
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.97	
Satd. Flow (prot)	1738	
Flt Permitted	0.97	
Satd. Flow (perm)	1738	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	10	57
RTOR Reduction (vph)	10	0
Lane Group Flow (vph)	218	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	13.2	
Effective Green, g (s)	13.2	
Actuated g/C Ratio	0.20	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	351	
v/s Ratio Prot	c0.13	
v/s Ratio Perm		
v/c Ratio	0.62	
Uniform Delay, d1	23.7	
Progression Factor	1.00	
Incremental Delay, d2	2.4	
Delay (s)	26.2	
Level of Service	C	
Approach Delay (s)	26.2	
Approach LOS	C	

Intersection Summary



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	15	910	15	5	20	845	35	10	0	15	35
Future Volume (vph)	5	15	910	15	5	20	845	35	10	0	15	35
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1593	3530			1593	3515			1676		
Flt Permitted		0.95	1.00			0.95	1.00			0.89		
Satd. Flow (perm)		1593	3530			1593	3515			1528		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	16	948	16	5	21	880	36	10	0	16	36
RTOR Reduction (vph)	0	0	1	0	0	0	2	0	0	24	0	0
Lane Group Flow (vph)	0	21	963	0	0	26	914	0	0	2	0	0
Confl. Bikes (#/hr)								2				
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		1.2	35.0			1.1	34.9			3.7		
Effective Green, g (s)		1.2	35.0			1.1	34.9			3.7		
Actuated g/C Ratio		0.02	0.65			0.02	0.65			0.07		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		35	2309			32	2292			105		
v/s Ratio Prot		0.01	c0.27			c0.02	0.26					
v/s Ratio Perm										0.00		
v/c Ratio		0.60	0.42			0.81	0.40			0.02		
Uniform Delay, d1		25.9	4.4			26.1	4.4			23.2		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		17.1	0.5			81.6	0.4			0.0		
Delay (s)		43.0	4.9			107.7	4.8			23.2		
Level of Service		D	A			F	A			C		
Approach Delay (s)			5.7				7.6			23.2		
Approach LOS			A				A			C		

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	13.7
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	35
Future Volume (vph)	0	35
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.93	
Flt Protected	0.98	
Satd. Flow (prot)	1695	
Flt Permitted	0.83	
Satd. Flow (perm)	1439	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	0	36
RTOR Reduction (vph)	67	0
Lane Group Flow (vph)	5	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	3.7	
Effective Green, g (s)	3.7	
Actuated g/C Ratio	0.07	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	99	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.05	
Uniform Delay, d1	23.3	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	23.3	
Level of Service	C	
Approach Delay (s)	23.3	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	220	675	10	24	10	720	330	10	15	15	5	653
Future Volume (vph)	220	675	10	24	10	720	330	10	15	15	5	653
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1710
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00		0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (prot)	1593	3531			1593	3539	1563		1828	1583		1513
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (perm)	1593	3531			1593	3539	1563		1828	1583		1513
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	703	10	25	10	750	344	10	16	16	5	680
RTOR Reduction (vph)	0	1	0	0	0	0	240	0	0	15	0	0
Lane Group Flow (vph)	229	712	0	0	35	750	104	0	26	1	0	352
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			1				1					
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	Split
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	16.8	41.3			3.6	27.1	27.1		3.0	3.0		25.4
Effective Green, g (s)	16.8	41.3			3.6	27.1	27.1		3.0	3.0		25.4
Actuated g/C Ratio	0.19	0.46			0.04	0.30	0.30		0.03	0.03		0.28
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2		0.2
Lane Grp Cap (vph)	297	1620			63	1065	470		60	52		427
v/s Ratio Prot	c0.14	0.20			0.02	c0.21			c0.01			c0.23
v/s Ratio Perm							0.07			0.00		
v/c Ratio	0.77	0.44			0.56	0.70	0.22		0.43	0.01		0.82
Uniform Delay, d1	34.8	16.5			42.4	27.9	23.5		42.7	42.1		30.2
Progression Factor	1.00	1.00			1.16	0.65	0.57		1.00	1.00		1.00
Incremental Delay, d2	10.7	0.9			5.4	3.6	1.0		1.8	0.0		11.7
Delay (s)	45.5	17.4			54.7	21.7	14.4		44.5	42.1		41.9
Level of Service	D	B			D	C	B		D	D		D
Approach Delay (s)		24.2				20.5			43.6			
Approach LOS		C				C			D			

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	15	175
Future Volume (vph)	15	175
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.4	4.4
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.95	1.00
Satd. Flow (prot)	1689	1560
Flt Permitted	0.95	1.00
Satd. Flow (perm)	1689	1560
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	16	182
RTOR Reduction (vph)	0	96
Lane Group Flow (vph)	349	86
Confl. Peds. (#/hr)		2
Confl. Bikes (#/hr)		1
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	25.4	25.4
Effective Green, g (s)	25.4	25.4
Actuated g/C Ratio	0.28	0.28
Clearance Time (s)	4.4	4.4
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	476	440
v/s Ratio Prot	0.21	
v/s Ratio Perm		0.06
v/c Ratio	0.73	0.20
Uniform Delay, d1	29.2	24.5
Progression Factor	1.00	1.00
Incremental Delay, d2	5.0	0.1
Delay (s)	34.2	24.6
Level of Service	C	C
Approach Delay (s)	35.3	
Approach LOS	D	

Intersection Summary

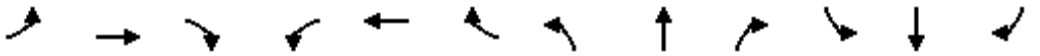
Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	1341	0	5	35	945	351	0	0	35	0	0	124
Future Vol, veh/h	0	1341	0	5	35	945	351	0	0	35	0	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	98	98	98	98	98	92	98	92	98	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1368	0	5	36	964	382	0	0	36	0	0	135

Major/Minor	Major1			Major2				Minor1			Minor2		
Conflicting Flow All	-	0	0	999	1368	0	0	-	-	684	-	-	673
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	5.64	5.34	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.32	3.12	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	440	259	-	-	0	0	335	0	0	341
Stage 1	0	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-			-	-						
Mov Cap-1 Maneuver	-	-	-	271	271	-	-	-	-	335	-	-	341
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

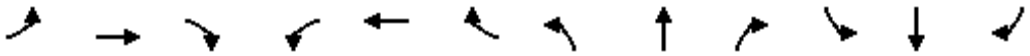
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	17	22.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	335	-	-	271	-	-	341
HCM Lane V/C Ratio	0.107	-	-	0.151	-	-	0.395
HCM Control Delay (s)	17	-	-	20.7	-	-	22.3
HCM Lane LOS	C	-	-	C	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	0.5	-	-	1.8



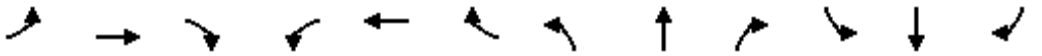
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1024	367	195	776	0	0	0	0	165	0	563
Future Volume (vph)	0	1024	367	195	776	0	0	0	0	165	0	563
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6408	1549	1593	3539						1770	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6408	1549	1593	3539						1770	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1045	374	199	792	0	0	0	0	168	0	574
RTOR Reduction (vph)	0	0	250	0	0	0	0	0	0	0	0	171
Lane Group Flow (vph)	0	1045	124	199	792	0	0	0	0	0	168	403
Confl. Peds. (#/hr)			1									
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		29.8	29.8	15.3	49.3						31.0	31.0
Effective Green, g (s)		29.8	29.8	15.3	49.3						31.0	31.0
Actuated g/C Ratio		0.33	0.33	0.17	0.55						0.34	0.34
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2121	512	270	1938						609	545
v/s Ratio Prot		c0.16		c0.12	0.22						0.09	
v/s Ratio Perm			0.08									c0.25
v/c Ratio		0.49	0.24	0.74	0.41						0.28	0.74
Uniform Delay, d1		24.1	21.9	35.4	11.9						21.4	25.9
Progression Factor		0.88	2.53	0.81	1.18						1.00	1.00
Incremental Delay, d2		0.7	0.9	7.0	0.5						0.2	4.9
Delay (s)		21.9	56.3	35.8	14.5						21.5	30.9
Level of Service		C	E	D	B						C	C
Approach Delay (s)		31.0			18.8			0.0			28.8	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	614	585	0	0	640	225	341	0	205	0	0	0
Future Volume (vph)	614	585	0	0	640	225	341	0	205	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3090	3539			3539	1563		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3090	3539			3539	1563		1770	1583			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	640	609	0	0	667	234	355	0	214	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	129	0	0	161	0	0	0
Lane Group Flow (vph)	640	609	0	0	667	105	0	355	53	0	0	0
Confl. Peds. (#/hr)			3			1						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	22.2	58.2			31.8	31.8		22.1	22.1			
Effective Green, g (s)	22.2	58.2			31.8	31.8		22.1	22.1			
Actuated g/C Ratio	0.25	0.65			0.35	0.35		0.25	0.25			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	762	2288			1250	552		434	388			
v/s Ratio Prot	c0.21	0.17			c0.19			c0.20				
v/s Ratio Perm						0.07			0.03			
v/c Ratio	0.84	0.27			0.53	0.19		0.82	0.14			
Uniform Delay, d1	32.2	6.8			23.2	20.2		32.1	26.5			
Progression Factor	0.46	0.12			1.28	2.33		1.00	1.00			
Incremental Delay, d2	7.4	0.3			1.5	0.7		11.5	0.2			
Delay (s)	22.3	1.1			31.3	47.8		43.6	26.7			
Level of Service	C	A			C	D		D	C			
Approach Delay (s)		12.0			35.5			37.2			0.0	
Approach LOS		B			D			D			A	

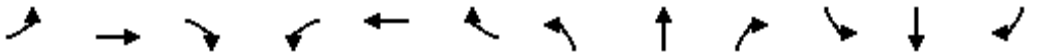
Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	320	420	30	35	435	95	55	30	15	90	60	340
Future Volume (vph)	320	420	30	35	435	95	55	30	15	90	60	340
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	3090	3539	1548	1593	3436			1804	1563		1808	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (perm)	3090	3539	1548	1593	3436			1804	1563		1808	1561
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	340	447	32	37	463	101	59	32	16	96	64	362
RTOR Reduction (vph)	0	0	14	0	13	0	0	0	14	0	0	319
Lane Group Flow (vph)	340	447	18	37	551	0	0	91	2	0	160	43
Confl. Peds. (#/hr)			1			1			1			
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2						3			4
Actuated Green, G (s)	12.6	49.3	49.3	3.6	39.4			9.3	9.3		10.6	10.6
Effective Green, g (s)	12.6	49.3	49.3	3.6	39.4			9.3	9.3		10.6	10.6
Actuated g/C Ratio	0.14	0.55	0.55	0.04	0.44			0.10	0.10		0.12	0.12
Clearance Time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Vehicle Extension (s)	0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	432	1938	847	63	1504			186	161		212	183
v/s Ratio Prot	c0.11	0.13		0.02	c0.16			c0.05			c0.09	
v/s Ratio Perm			0.01						0.00			0.03
v/c Ratio	0.79	0.23	0.02	0.59	0.37			0.49	0.01		0.75	0.23
Uniform Delay, d1	37.4	10.5	9.3	42.5	16.9			38.1	36.2		38.4	36.0
Progression Factor	0.85	1.73	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.3	0.3	0.0	8.7	0.7			0.7	0.0		12.7	0.2
Delay (s)	39.9	18.5	9.4	51.2	17.6			38.8	36.2		51.1	36.3
Level of Service	D	B	A	D	B			D	D		D	D
Approach Delay (s)		27.0			19.7			38.5			40.8	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	465	5	0	450	35	10	0	5	20	0	110
Future Volume (Veh/h)	95	465	5	0	450	35	10	0	5	20	0	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	99	484	5	0	469	36	10	0	5	21	0	115
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	505			489			1034	1190	486	1176	1174	252
vC1, stage 1 conf vol							684	684		487	487	
vC2, stage 2 conf vol							350	505		690	687	
vCu, unblocked vol	505			375			981	1154	372	1140	1137	252
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			97	100	99	93	100	85
cM capacity (veh/h)	1056			1060			309	324	562	317	346	747

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	588	234	270	15	21	115
Volume Left	99	0	0	10	21	0
Volume Right	5	0	36	5	0	115
cSH	1056	1060	1700	363	317	747
Volume to Capacity	0.09	0.00	0.16	0.04	0.07	0.15
Queue Length 95th (ft)	8	0	0	3	5	14
Control Delay (s)	2.4	0.0	0.0	15.3	17.2	10.7
Lane LOS	A			C	C	B
Approach Delay (s)	2.4	0.0		15.3	11.7	
Approach LOS				C	B	

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	430	15	15	460	20	10
Future Vol, veh/h	430	15	15	460	20	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	453	16	16	484	21	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	468	0	977	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	516	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1094	-	278	600
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1094	-	272	600
Mov Cap-2 Maneuver	-	-	-	-	272	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	587	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	333	-	-	1094	-
HCM Lane V/C Ratio	0.095	-	-	0.014	-
HCM Control Delay (s)	16.9	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	415	10	5	450	20	5	0	10	35	0	15
Future Vol, veh/h	20	415	10	5	450	20	5	0	10	35	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	446	11	5	484	22	5	0	11	38	0	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	505	0	0	457	0	0	1008	1011	452	1005	1005	495
Stage 1	-	-	-	-	-	-	495	495	-	505	505	-
Stage 2	-	-	-	-	-	-	513	516	-	500	500	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1060	-	-	1104	-	-	219	240	608	220	241	575
Stage 1	-	-	-	-	-	-	556	546	-	549	540	-
Stage 2	-	-	-	-	-	-	544	534	-	553	543	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1060	-	-	1104	-	-	207	232	608	211	233	575
Mov Cap-2 Maneuver	-	-	-	-	-	-	207	232	-	211	233	-
Stage 1	-	-	-	-	-	-	540	531	-	534	537	-
Stage 2	-	-	-	-	-	-	526	531	-	528	528	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.1	15.2	22.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	369	1060	-	-	1104	-	-	260
HCM Lane V/C Ratio	0.044	0.02	-	-	0.005	-	-	0.207
HCM Control Delay (s)	15.2	8.5	0	-	8.3	0	-	22.4
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	140	295	315	50	55	155
Future Vol, veh/h	140	295	315	50	55	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	161	339	362	57	63	178

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	420	0	-	0	1052	391
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	661	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1139	-	-	-	251	658
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1139	-	-	-	216	658
Mov Cap-2 Maneuver	-	-	-	-	216	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	441	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	23.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1139	-	-	-	428
HCM Lane V/C Ratio	0.141	-	-	-	0.564
HCM Control Delay (s)	8.7	-	-	-	23.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.5	-	-	-	3.4

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	210	145	125	20	20	245
Future Vol, veh/h	210	145	125	20	20	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	236	163	140	22	22	275

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	163	0	-	0	787	152
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	635	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1416	-	-	-	360	894
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	528	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1416	-	-	-	300	894
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	440	-

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1416	-	-	-	778
HCM Lane V/C Ratio	0.167	-	-	-	0.383
HCM Control Delay (s)	8.1	-	-	-	12.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.6	-	-	-	1.8

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	205	240	25	30	55
Future Vol, veh/h	35	205	240	25	30	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	214	250	26	31	57

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	276	0	-	0	549	263
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	286	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1287	-	-	-	497	776
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1287	-	-	-	481	776
Mov Cap-2 Maneuver	-	-	-	-	481	-
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1287	-	-	-	638
HCM Lane V/C Ratio	0.028	-	-	-	0.139
HCM Control Delay (s)	7.9	0	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

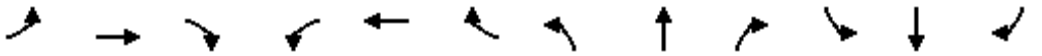
Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	75	145	170	40	50	75
Future Vol, veh/h	75	145	170	40	50	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	135	-	-	275	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	154	181	43	53	80

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	181	0	-	0	495	181
Stage 1	-	-	-	-	181	-
Stage 2	-	-	-	-	314	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1394	-	-	-	534	862
Stage 1	-	-	-	-	850	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1394	-	-	-	503	862
Mov Cap-2 Maneuver	-	-	-	-	503	-
Stage 1	-	-	-	-	850	-
Stage 2	-	-	-	-	698	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1394	-	-	-	671
HCM Lane V/C Ratio	0.057	-	-	-	0.198
HCM Control Delay (s)	7.7	-	-	-	11.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	10	70	5	15	15	70	290	10	15	260	135
Future Volume (vph)	135	10	70	5	15	15	70	290	10	15	260	135
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1582		1593	1700		1593	1852		1593	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1582		1593	1700		1593	1852		1593	1863	1548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	142	11	74	5	16	16	74	305	11	16	274	142
RTOR Reduction (vph)	0	58	0	0	15	0	0	1	0	0	0	96
Lane Group Flow (vph)	142	27	0	5	17	0	74	315	0	16	274	46
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			4			1			2			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.0	11.3		0.7	3.0		5.3	21.7		0.7	17.1	17.1
Effective Green, g (s)	9.0	11.3		0.7	3.0		5.3	21.7		0.7	17.1	17.1
Actuated g/C Ratio	0.17	0.22		0.01	0.06		0.10	0.41		0.01	0.33	0.33
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	273	341		21	97		161	766		21	607	505
v/s Ratio Prot	c0.09	0.02		0.00	c0.01		c0.05	c0.17		0.01	0.15	
v/s Ratio Perm												0.03
v/c Ratio	0.52	0.08		0.24	0.17		0.46	0.41		0.76	0.45	0.09
Uniform Delay, d1	19.7	16.4		25.6	23.5		22.2	10.8		25.8	13.9	12.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	0.1		5.8	0.9		2.1	0.4		92.1	0.5	0.1
Delay (s)	21.5	16.5		31.4	24.4		24.3	11.2		117.8	14.5	12.3
Level of Service	C	B		C	C		C	B		F	B	B
Approach Delay (s)		19.6			25.3			13.7			17.6	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	0	10	515	0	30	58	10	243	211	90	268
Future Volume (vph)	10	0	10	515	0	30	58	10	243	211	90	268
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3529
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1513	1681	1583		1593	1863	1583	1593	3529
Peak-hour factor, PHF	0.93	0.92	0.93	0.92	0.92	0.92	0.92	0.93	0.93	0.92	0.92	0.93
Adj. Flow (vph)	11	0	11	560	0	33	63	11	261	229	98	288
RTOR Reduction (vph)	0	0	11	0	0	23	0	0	0	170	0	1
Lane Group Flow (vph)	0	11	0	280	280	10	0	74	261	59	98	292
Confl. Bikes (#/hr)												
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		1.8	1.8	20.0	20.0	20.0		6.1	16.5	16.5	7.0	17.4
Effective Green, g (s)		1.8	1.8	20.0	20.0	20.0		6.1	16.5	16.5	7.0	17.4
Actuated g/C Ratio		0.03	0.03	0.31	0.31	0.31		0.10	0.26	0.26	0.11	0.27
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		49	44	472	524	493		151	479	407	173	957
v/s Ratio Prot		c0.01		c0.19	0.17			0.05	c0.14		c0.06	0.08
v/s Ratio Perm			0.00			0.01				0.04		
v/c Ratio		0.22	0.01	0.59	0.53	0.02		0.49	0.54	0.14	0.57	0.30
Uniform Delay, d1		30.5	30.3	18.6	18.2	15.3		27.5	20.6	18.4	27.1	18.5
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.0	2.0	1.1	0.0		0.9	2.2	0.3	4.2	0.4
Delay (s)		31.3	30.3	20.6	19.3	15.3		28.4	22.7	18.7	31.3	18.9
Level of Service		C	C	C	B	B		C	C	B	C	B
Approach Delay (s)		30.8			19.7				21.8			22.0
Approach LOS		C			B				C			C

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	64.1	Sum of lost time (s)	18.8
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	15	275	20	10	285
Future Vol, veh/h	15	15	275	20	10	285
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	16	299	22	11	310

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	642	310	0	0	321	0
Stage 1	310	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	438	730	-	-	1239	-
Stage 1	744	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	433	730	-	-	1239	-
Mov Cap-2 Maneuver	531	-	-	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	719	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	615	1239	-
HCM Lane V/C Ratio	-	-	0.053	0.009	-
HCM Control Delay (s)	-	-	11.2	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	35	265	20	35	280
Future Vol, veh/h	20	35	265	20	35	280
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	37	279	21	37	295

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	658	290	0	0	301	0
Stage 1	290	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	429	749	-	-	1260	-
Stage 1	759	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	414	748	-	-	1260	-
Mov Cap-2 Maneuver	514	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	676	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	642	1260	-
HCM Lane V/C Ratio	-	-	0.09	0.029	-
HCM Control Delay (s)	-	-	11.2	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

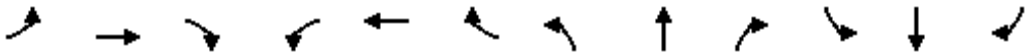
Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	5	15	50	10	30	10	255	40	25	250	10
Future Vol, veh/h	15	5	15	50	10	30	10	255	40	25	250	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	5	16	53	11	32	11	271	43	27	266	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	659	660	271	650	645	294	277	0	0	315	0	0
Stage 1	324	324	-	315	315	-	-	-	-	-	-	-
Stage 2	335	336	-	335	330	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	377	383	768	382	391	745	1286	-	-	1245	-	-
Stage 1	688	650	-	696	656	-	-	-	-	-	-	-
Stage 2	679	642	-	679	646	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	343	369	768	360	377	744	1286	-	-	1245	-	-
Mov Cap-2 Maneuver	343	369	-	360	377	-	-	-	-	-	-	-
Stage 1	681	633	-	688	649	-	-	-	-	-	-	-
Stage 2	633	635	-	642	629	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.6	15.5	0.3	0.7
HCM LOS	B	C		

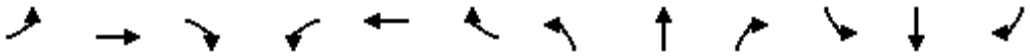
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1286	-	-	456	437	1245	-	-
HCM Lane V/C Ratio	0.008	-	-	0.082	0.219	0.021	-	-
HCM Control Delay (s)	7.8	0	-	13.6	15.5	8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.8	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	175	110	145	195	100	90	195	110	100	160	35
Future Volume (vph)	20	175	110	145	195	100	90	195	110	100	160	35
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1561	1593	3539	1558	1593	3331		1593	3435	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1561	1593	3539	1558	1593	3331		1593	3435	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	186	117	154	207	106	96	207	117	106	170	37
RTOR Reduction (vph)	0	0	89	0	0	68	0	75	0	0	17	0
Lane Group Flow (vph)	21	186	28	154	207	38	96	249	0	106	190	0
Confl. Peds. (#/hr)						6			2			5
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.0	14.8	14.8	8.8	22.6	22.6	6.9	14.6		7.3	15.0	
Effective Green, g (s)	1.0	14.8	14.8	8.8	22.6	22.6	6.9	14.6		7.3	15.0	
Actuated g/C Ratio	0.02	0.24	0.24	0.14	0.36	0.36	0.11	0.23		0.12	0.24	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	25	838	369	224	1279	563	175	778		186	824	
v/s Ratio Prot	0.01	c0.05		c0.10	0.06		0.06	c0.07		c0.07	0.06	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.84	0.22	0.08	0.69	0.16	0.07	0.55	0.32		0.57	0.23	
Uniform Delay, d1	30.7	19.2	18.5	25.5	13.5	13.1	26.3	19.8		26.1	19.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	106.1	0.3	0.2	6.8	0.1	0.1	1.9	0.5		2.4	0.3	
Delay (s)	136.7	19.5	18.7	32.4	13.7	13.2	28.2	20.3		28.5	19.4	
Level of Service	F	B	B	C	B	B	C	C		C	B	
Approach Delay (s)		26.8			19.7			22.1			22.5	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	62.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	35	15	225	35	60	45	330	210	50	330	75
Future Volume (vph)	40	35	15	225	35	60	45	330	210	50	330	75
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	1780		1593	1686		1593	3328		1593	3425	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	1780		1593	1686		1593	3328		1593	3425	
Peak-hour factor, PHF	0.96	0.92	0.96	0.92	0.92	0.92	0.96	0.96	0.92	0.92	0.96	0.96
Adj. Flow (vph)	42	38	16	245	38	65	47	344	228	54	344	78
RTOR Reduction (vph)	0	15	0	0	47	0	0	110	0	0	18	0
Lane Group Flow (vph)	42	39	0	245	56	0	47	462	0	54	404	0
Confl. Peds. (#/hr)												2
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.9	3.8		16.5	16.4		4.0	15.6		4.2	15.8	
Effective Green, g (s)	3.9	3.8		16.5	16.4		4.0	15.6		4.2	15.8	
Actuated g/C Ratio	0.07	0.07		0.28	0.28		0.07	0.27		0.07	0.27	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	106	116		452	475		109	893		115	931	
v/s Ratio Prot	0.03	c0.02		c0.15	0.03		0.03	c0.14		c0.03	0.12	
v/s Ratio Perm												
v/c Ratio	0.40	0.34		0.54	0.12		0.43	0.52		0.47	0.43	
Uniform Delay, d1	26.0	25.9		17.6	15.5		26.0	18.0		25.9	17.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	1.7		1.3	0.1		2.7	0.5		3.0	0.3	
Delay (s)	28.4	27.7		18.9	15.6		28.7	18.6		28.9	17.8	
Level of Service	C	C		B	B		C	B		C	B	
Approach Delay (s)		28.0			17.9			19.3			19.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

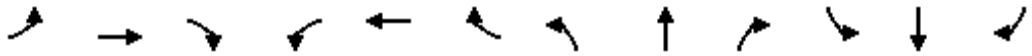
Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	45	325	15	40	335
Future Vol, veh/h	15	45	325	15	40	335
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	48	349	16	43	360

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	624	183	0	0	366	0
Stage 1	358	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	417	828	-	-	1189	-
Stage 1	678	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	398	828	-	-	1189	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	720	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	1
HCM LOS	B		

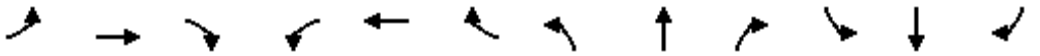
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	711	1189	-
HCM Lane V/C Ratio	-	-	0.091	0.036	-
HCM Control Delay (s)	-	-	10.6	8.1	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	5	20	10	15	10	35	345	5	10	385	55
Future Volume (vph)	40	5	20	10	15	10	35	345	5	10	385	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.96		1.00	1.00		1.00	0.98	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1723			1764		1593	3531		1593	3464	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1723			1764		1593	3531		1593	3464	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	43	5	22	11	16	11	38	371	5	11	414	59
RTOR Reduction (vph)	0	18	0	0	10	0	0	1	0	0	12	0
Lane Group Flow (vph)	0	52	0	0	28	0	38	375	0	11	461	0
Confl. Peds. (#/hr)			2						1			
Confl. Bikes (#/hr)									2			1
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		8.7			6.0		2.2	16.8		0.7	15.3	
Effective Green, g (s)		8.7			6.0		2.2	16.8		0.7	15.3	
Actuated g/C Ratio		0.18			0.12		0.05	0.34		0.01	0.31	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		307			217		71	1218		22	1088	
v/s Ratio Prot		c0.03			c0.02		c0.02	0.11		0.01	c0.13	
v/s Ratio Perm												
v/c Ratio		0.17			0.13		0.54	0.31		0.50	0.42	
Uniform Delay, d1		16.9			19.0		22.7	11.7		23.8	13.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.1		3.8	0.3		6.4	0.5	
Delay (s)		17.0			19.1		26.6	12.0		30.2	13.8	
Level of Service		B			B		C	B		C	B	
Approach Delay (s)		17.0			19.1			13.3			14.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

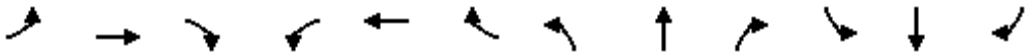
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	0	15	5	0	0	15	460	5	15	510	20
Future Volume (vph)	20	0	15	5	0	0	15	460	5	15	510	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1697			1770		1593	3533		1593	3516	
Flt Permitted		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1746			1863		1593	3533		1593	3516	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	22	0	16	5	0	0	16	495	5	16	548	22
RTOR Reduction (vph)	0	35	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	3	0	0	5	0	16	499	0	16	568	0
Confl. Peds. (#/hr)			5			8			7			
Confl. Bikes (#/hr)									1			3
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		3.1			0.5		0.5	18.1		0.5	18.1	
Effective Green, g (s)		3.1			0.5		0.5	18.1		0.5	18.1	
Actuated g/C Ratio		0.08			0.01		0.01	0.47		0.01	0.47	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		139			24		20	1652		20	1644	
v/s Ratio Prot							c0.01	0.14		0.01	c0.16	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.02			0.21		0.80	0.30		0.80	0.35	
Uniform Delay, d1		16.4			18.9		19.1	6.4		19.1	6.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			1.6		105.9	0.3		105.9	0.4	
Delay (s)		16.4			20.5		124.9	6.7		124.9	6.9	
Level of Service		B			C		F	A		F	A	
Approach Delay (s)		16.4			20.5			10.4			10.2	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	38.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	220	55	170	260	315	70	325	135	275	375	135
Future Volume (vph)	95	220	55	170	260	315	70	325	135	275	375	135
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1545	1593	3539	1551	1593	3365		1593	3383	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1545	1593	3539	1551	1593	3365		1593	3383	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	100	232	58	179	274	332	74	342	142	289	395	142
RTOR Reduction (vph)	0	0	48	0	0	248	0	31	0	0	21	0
Lane Group Flow (vph)	100	232	10	179	274	84	74	453	0	289	516	0
Confl. Peds. (#/hr)			4			10			5			4
Confl. Bikes (#/hr)			7						2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.0	16.2	16.2	15.9	24.1	24.1	7.8	22.4		24.8	39.1	
Effective Green, g (s)	8.0	16.2	16.2	15.9	24.1	24.1	7.8	22.4		24.8	39.1	
Actuated g/C Ratio	0.08	0.17	0.17	0.17	0.25	0.25	0.08	0.23		0.26	0.41	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	258	600	262	265	893	391	130	789		413	1385	
v/s Ratio Prot	0.03	c0.07		c0.11	0.08		0.05	c0.13		c0.18	0.15	
v/s Ratio Perm			0.01			0.05						
v/c Ratio	0.39	0.39	0.04	0.68	0.31	0.21	0.57	0.57		0.70	0.37	
Uniform Delay, d1	41.4	35.2	33.1	37.4	28.9	28.2	42.2	32.3		32.0	19.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.9	0.1	5.3	0.4	0.6	3.4	1.6		4.2	0.4	
Delay (s)	41.8	36.1	33.3	42.6	29.3	28.8	45.6	33.9		36.1	20.0	
Level of Service	D	D	C	D	C	C	D	C		D	C	
Approach Delay (s)		37.1			32.1			35.5			25.6	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	10	285	25	10	290
Future Vol, veh/h	80	10	285	25	10	290
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	11	310	27	11	315

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	660	323	0	0	337	0
Stage 1	323	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	428	718	-	-	1222	-
Stage 1	734	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	424	718	-	-	1222	-
Mov Cap-2 Maneuver	424	-	-	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	716	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	444	1222	-
HCM Lane V/C Ratio	-	-	0.22	0.009	-
HCM Control Delay (s)	-	-	15.4	8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	232	52	269	132	0	627
Future Vol, veh/h	232	52	269	132	0	627
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	252	57	292	143	0	682

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	705	218	0	0	-	-
Stage 1	364	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Critical Hdwy	7	7.1	-	-	-	-
Critical Hdwy Stg 1	6	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.9	3.32	-	-	-	-
Pot Cap-1 Maneuver	335	779	-	-	0	-
Stage 1	609	-	-	-	0	-
Stage 2	631	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	335	779	-	-	-	-
Mov Cap-2 Maneuver	436	-	-	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	631	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBT
Capacity (veh/h)	-	-	436	779	-
HCM Lane V/C Ratio	-	-	0.578	0.073	-
HCM Control Delay (s)	-	-	24	10	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	3.6	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	90	70	360	95	320	5	65	775	415	250	350
Future Volume (vph)	15	90	70	360	95	320	5	65	775	415	250	350
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1490	3312	1461	2891	1518	1408		1490	3312	1482	2891	3312
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1490	3312	1461	2891	1518	1408		1490	3312	1482	2891	3312
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	98	76	391	103	348	5	71	842	451	272	380
RTOR Reduction (vph)	0	0	64	0	35	169	0	0	0	158	0	0
Lane Group Flow (vph)	16	98	12	391	197	50	0	76	842	293	272	380
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot	NA
Protected Phases	8	8		7	7		1	1	6	7	5	2
Permitted Phases			8			7				6		
Actuated Green, G (s)	18.2	18.2	18.2	25.4	25.4	25.4		9.6	31.8	57.2	16.3	38.5
Effective Green, g (s)	18.2	18.2	18.2	25.4	25.4	25.4		9.6	31.8	57.2	16.3	38.5
Actuated g/C Ratio	0.16	0.16	0.16	0.23	0.23	0.23		0.09	0.28	0.51	0.15	0.34
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	3.0	5.0
Lane Grp Cap (vph)	242	539	237	656	344	319		127	942	758	421	1140
v/s Ratio Prot	0.01	c0.03		c0.14	0.13			0.05	c0.25	0.09	c0.09	0.11
v/s Ratio Perm			0.01			0.04				0.11		
v/c Ratio	0.07	0.18	0.05	0.60	0.57	0.16		0.60	0.89	0.39	0.65	0.33
Uniform Delay, d1	39.6	40.4	39.5	38.6	38.4	34.6		49.2	38.4	16.6	45.0	27.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	1.5	2.3	0.2		7.4	11.5	0.3	3.4	0.4
Delay (s)	39.7	40.5	39.6	40.1	40.7	34.8		56.6	49.9	16.9	48.4	27.5
Level of Service	D	D	D	D	D	C		E	D	B	D	C
Approach Delay (s)		40.1			38.9				39.4			36.0
Approach LOS		D			D				D			D

Intersection Summary			
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	111.8	Sum of lost time (s)	20.1
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1448
Flt Permitted	1.00
Satd. Flow (perm)	1448
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	11
RTOR Reduction (vph)	7
Lane Group Flow (vph)	4
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	9%
Turn Type	Perm
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	38.5
Effective Green, g (s)	38.5
Actuated g/C Ratio	0.34
Clearance Time (s)	6.5
Vehicle Extension (s)	5.0
Lane Grp Cap (vph)	498
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.01
Uniform Delay, d1	24.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	24.1
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	35	90	615	50	265	600	120	110	140	580	85	60
Future Volume (vph)	35	90	615	50	265	600	120	110	140	580	85	60
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900
Total Lost time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1533	3406	1524	1533	3406	1484	1533	1792	1524	1533	1666
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1533	3406	1524	1533	3406	1484	1533	1792	1524	1533	1666
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	98	668	54	288	652	130	120	152	630	92	65
RTOR Reduction (vph)	0	0	0	38	0	0	77	0	0	463	0	21
Lane Group Flow (vph)	0	136	668	16	288	652	53	120	152	167	92	93
Confl. Peds. (#/hr)							3					
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			6			3		
Actuated Green, G (s)		12.5	30.4	30.4	24.2	42.1	42.1	16.6	16.6	16.6	13.7	13.7
Effective Green, g (s)		12.5	30.4	30.4	24.2	42.1	42.1	16.6	16.6	16.6	13.7	13.7
Actuated g/C Ratio		0.12	0.30	0.30	0.24	0.41	0.41	0.16	0.16	0.16	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0	2.0	8.0	8.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		187	1011	452	362	1400	610	248	290	247	205	222
v/s Ratio Prot		0.09	c0.20		c0.19	0.19		0.08	0.08		c0.06	0.06
v/s Ratio Perm				0.01			0.04			c0.11		
v/c Ratio		0.73	0.66	0.04	0.80	0.47	0.09	0.48	0.52	0.68	0.45	0.42
Uniform Delay, d1		43.3	31.5	25.6	36.8	22.0	18.4	39.0	39.3	40.4	40.9	40.7
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		11.3	3.4	0.1	10.7	1.0	0.3	0.5	0.8	5.7	0.6	0.5
Delay (s)		54.6	34.9	25.7	47.5	23.0	18.7	39.5	40.1	46.1	41.4	41.2
Level of Service		D	C	C	D	C	B	D	D	D	D	D
Approach Delay (s)			37.4			29.1			44.2			41.3
Approach LOS			D			C			D			D

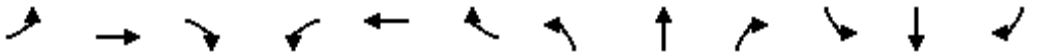
Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	102.4	Sum of lost time (s)	17.5
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	49
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1175	30	45	900	385	10	10	20	280	20	50
Future Volume (vph)	45	1175	30	45	900	385	10	10	20	280	20	50
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.93			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (prot)	1533	3393		1533	3406	1486		1651			1687	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (perm)	1533	3393		1533	3406	1486		1651			1687	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	1277	33	49	978	418	11	11	22	304	22	54
RTOR Reduction (vph)	0	1	0	0	0	242	0	21	0	0	4	0
Lane Group Flow (vph)	49	1309	0	49	978	176	0	23	0	0	376	0
Confl. Peds. (#/hr)						3						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						
Actuated Green, G (s)	4.9	36.5		7.3	38.5	38.5		3.9			25.7	
Effective Green, g (s)	4.9	36.5		7.3	38.5	38.5		3.9			25.7	
Actuated g/C Ratio	0.05	0.40		0.08	0.42	0.42		0.04			0.28	
Clearance Time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Vehicle Extension (s)	2.0	7.9		2.0	7.3	7.3		2.0			2.0	
Lane Grp Cap (vph)	82	1357		122	1437	627		70			475	
v/s Ratio Prot	c0.03	c0.39		0.03	0.29			c0.01			c0.22	
v/s Ratio Perm						0.12						
v/c Ratio	0.60	0.96		0.40	0.68	0.28		0.33			0.79	
Uniform Delay, d1	42.2	26.7		39.9	21.4	17.3		42.4			30.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	7.6	17.3		0.8	2.4	0.9		1.0			8.2	
Delay (s)	49.8	44.0		40.7	23.8	18.2		43.4			38.4	
Level of Service	D	D		D	C	B		D			D	
Approach Delay (s)		44.2			22.8			43.4			38.4	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	18.2
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1420	15	5	10	1285	45	10	0	15	35	0
Future Volume (vph)	20	1420	15	5	10	1285	45	10	0	15	35	0
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Frt	1.00	1.00			1.00	0.99			0.92			0.94
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.97
Satd. Flow (prot)	1518	3368			1518	3354			1601			1629
Flt Permitted	0.95	1.00			0.95	1.00			0.88			0.80
Satd. Flow (perm)	1518	3368			1518	3354			1446			1349
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1543	16	5	11	1397	49	11	0	16	38	0
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	26	0	0	62
Lane Group Flow (vph)	22	1559	0	0	16	1445	0	0	1	0	0	3
Confl. Peds. (#/hr)			1				1					
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	3.0	78.7			2.8	78.5			4.8			4.8
Effective Green, g (s)	3.0	78.7			2.8	78.5			4.8			4.8
Actuated g/C Ratio	0.03	0.79			0.03	0.78			0.05			0.05
Clearance Time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Vehicle Extension (s)	2.0	7.3			2.0	7.3			2.0			2.0
Lane Grp Cap (vph)	45	2650			42	2632			69			64
v/s Ratio Prot	c0.01	c0.46			0.01	0.43						
v/s Ratio Perm									0.00			c0.00
v/c Ratio	0.49	0.59			0.38	0.55			0.02			0.05
Uniform Delay, d1	47.7	4.2			47.7	4.1			45.4			45.4
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	3.0	1.0			2.1	0.8			0.0			0.1
Delay (s)	50.8	5.2			49.8	4.9			45.4			45.5
Level of Service	D	A			D	A			D			D
Approach Delay (s)		5.8				5.4			45.4			45.5
Approach LOS		A				A			D			D

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	25
Future Volume (vph)	25
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	7%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	305	1130	20	5	40	1130	410	25	25	25	160	15
Future Volume (vph)	305	1130	20	5	40	1130	410	25	25	25	160	15
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (prot)	1533	3397			1533	3406	1524		1749	1524	1456	1635
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (perm)	1533	3397			1533	3406	1524		1749	1524	1456	1635
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	1228	22	5	43	1228	446	27	27	27	174	16
RTOR Reduction (vph)	0	1	0	0	0	0	253	0	0	26	0	0
Lane Group Flow (vph)	332	1249	0	0	48	1228	193	0	54	2	94	96
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	23.0	55.5			4.2	35.7	35.7		5.0	5.0	8.6	8.6
Effective Green, g (s)	23.0	55.5			4.2	35.7	35.7		5.0	5.0	8.6	8.6
Actuated g/C Ratio	0.26	0.62			0.05	0.40	0.40		0.06	0.06	0.10	0.10
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	391	2094			71	1351	604		97	84	139	156
v/s Ratio Prot	c0.22	0.37			0.03	c0.36			c0.03		c0.06	0.06
v/s Ratio Perm							0.13			0.00		
v/c Ratio	0.85	0.60			0.68	0.91	0.32		0.56	0.02	0.68	0.62
Uniform Delay, d1	31.9	10.5			42.2	25.6	18.8		41.4	40.2	39.4	39.1
Progression Factor	1.00	1.00			1.16	0.62	0.69		1.00	1.00	1.00	1.00
Incremental Delay, d2	15.1	1.3			12.4	7.4	0.9		3.9	0.0	9.8	5.0
Delay (s)	46.9	11.7			61.6	23.4	13.9		45.3	40.2	49.1	44.1
Level of Service	D	B			E	C	B		D	D	D	D
Approach Delay (s)		19.1				22.0			43.6			42.0
Approach LOS		B				C			D			D

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	175
Future Volume (vph)	175
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	190
RTOR Reduction (vph)	172
Lane Group Flow (vph)	18
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.6
Effective Green, g (s)	8.6
Actuated g/C Ratio	0.10
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	145
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.13
Uniform Delay, d1	37.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	37.4
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

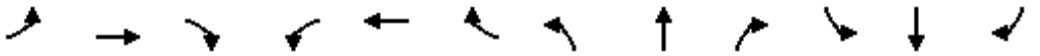
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1320	0	30	1585	0	30
Future Vol, veh/h	1320	0	30	1585	0	30
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	1435	0	33	1723	0	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1436	0	-	718
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	5.42	-	-	7.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.16	-	-	3.96
Pot Cap-1 Maneuver	-	-	231	-	0	312
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	231	-	-	312
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	17.9
HCM LOS			C

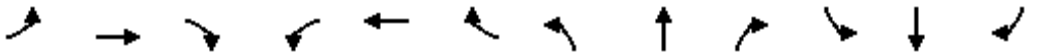
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	312	-	-	231	-
HCM Lane V/C Ratio	0.105	-	-	0.141	-
HCM Control Delay (s)	17.9	-	-	23.1	-
HCM Lane LOS	C	-	-	C	-
HCM 95th %tile Q(veh)	0.3	-	-	0.5	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1025	330	240	960	0	0	0	0	235	5	670
Future Volume (vph)	0	1025	330	240	960	0	0	0	0	235	5	670
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6285	1517	1562	3471						1742	1553
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6285	1517	1562	3471						1742	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1114	359	261	1043	0	0	0	0	255	5	728
RTOR Reduction (vph)	0	0	244	0	0	0	0	0	0	0	0	110
Lane Group Flow (vph)	0	1114	115	261	1043	0	0	0	0	0	260	618
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		28.8	28.8	18.1	51.1						29.2	29.2
Effective Green, g (s)		28.8	28.8	18.1	51.1						29.2	29.2
Actuated g/C Ratio		0.32	0.32	0.20	0.57						0.32	0.32
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2011	485	314	1970						565	503
v/s Ratio Prot		0.18		c0.17	c0.30						0.15	
v/s Ratio Perm			0.08									c0.40
v/c Ratio		0.55	0.24	0.83	0.53						0.46	1.23
Uniform Delay, d1		25.3	22.5	34.5	12.0						24.1	30.4
Progression Factor		0.71	0.64	0.95	0.95						1.00	1.00
Incremental Delay, d2		1.0	1.0	9.0	0.5						0.4	119.4
Delay (s)		19.0	15.4	41.7	11.9						24.6	149.8
Level of Service		B	B	D	B						C	F
Approach Delay (s)		18.1			17.9			0.0			116.8	
Approach LOS		B			B			A			F	

Intersection Summary					
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9		
Intersection Capacity Utilization	87.5%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	515	765	0	0	645	560	540	0	310	0	0	0
Future Volume (vph)	515	765	0	0	645	560	540	0	310	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	560	832	0	0	701	609	587	0	337	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	333	0	0	132	0	0	0
Lane Group Flow (vph)	560	832	0	0	701	276	0	587	205	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	20.4	53.9			29.3	29.3		26.4	26.4			
Effective Green, g (s)	20.4	53.9			29.3	29.3		26.4	26.4			
Actuated g/C Ratio	0.23	0.60			0.33	0.33		0.29	0.29			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	693	2099			1141	510		513	459			
v/s Ratio Prot	c0.18	0.24			c0.20			c0.33				
v/s Ratio Perm						0.18			0.13			
v/c Ratio	0.81	0.40			0.61	0.54		1.14	0.45			
Uniform Delay, d1	32.9	9.5			25.6	24.9		31.8	25.9			
Progression Factor	0.54	0.24			1.37	2.99		1.00	1.00			
Incremental Delay, d2	6.1	0.5			1.8	3.0		85.9	0.7			
Delay (s)	24.0	2.8			36.8	77.3		117.7	26.6			
Level of Service	C	A			D	E		F	C			
Approach Delay (s)		11.3			55.6			84.5			0.0	
Approach LOS		B			E			F			A	

Intersection Summary			
HCM 2000 Control Delay	46.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

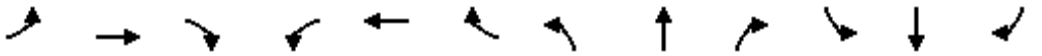
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	474	432	170	65	645	190	160	30	65	155	25
Future Volume (vph)	15	474	432	170	65	645	190	160	30	65	155	25
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3090	3539	1549	1593	3407			1788	1558		1786
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3090	3539	1549	1593	3407			1788	1558		1786
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	499	455	179	68	679	200	168	32	68	163	26
RTOR Reduction (vph)	0	0	0	97	0	23	0	0	0	57	0	0
Lane Group Flow (vph)	0	515	455	82	68	856	0	0	200	11	0	189
Confl. Peds. (#/hr)				1			2			4		
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		17.2	41.2	41.2	5.4	28.5			14.1	14.1		12.1
Effective Green, g (s)		17.2	41.2	41.2	5.4	28.5			14.1	14.1		12.1
Actuated g/C Ratio		0.19	0.46	0.46	0.06	0.32			0.16	0.16		0.13
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		590	1620	709	95	1078			280	244		240
v/s Ratio Prot		c0.17	0.13		0.04	c0.25			c0.11			c0.11
v/s Ratio Perm				0.05						0.01		
v/c Ratio		0.87	0.28	0.12	0.72	0.79			0.71	0.04		0.79
Uniform Delay, d1		35.3	15.2	14.0	41.5	28.1			36.0	32.2		37.7
Progression Factor		0.85	1.20	2.72	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		12.1	0.4	0.3	19.1	6.0			7.0	0.0		14.5
Delay (s)		42.3	18.7	38.3	60.6	34.1			43.0	32.3		52.2
Level of Service		D	B	D	E	C			D	C		D
Approach Delay (s)			32.3			36.0			40.3			40.5
Approach LOS			C			D			D			D

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	395
Future Volume (vph)	395
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	416
RTOR Reduction (vph)	360
Lane Group Flow (vph)	56
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	12.1
Effective Green, g (s)	12.1
Actuated g/C Ratio	0.13
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	212
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.26
Uniform Delay, d1	35.0
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	35.2
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	585	10	5	780	15	0	0	0	15	0	110
Future Volume (Veh/h)	45	585	10	5	780	15	0	0	0	15	0	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	636	11	5	848	16	0	0	0	16	0	120
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	864			647			1294	1614	642	1606	1611	432
vC1, stage 1 conf vol							740	740		866	866	
vC2, stage 2 conf vol							554	874		740	745	
vCu, unblocked vol	864			533			1266	1629	527	1620	1626	432
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			100	100	100	93	100	79
cM capacity (veh/h)	762			897			247	248	433	230	266	566

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	696	429	440	0	16	120
Volume Left	49	5	0	0	16	0
Volume Right	11	0	16	0	0	120
cSH	762	897	1700	1700	230	566
Volume to Capacity	0.06	0.01	0.26	0.00	0.07	0.21
Queue Length 95th (ft)	5	0	0	0	6	20
Control Delay (s)	1.7	0.2	0.0	0.0	21.8	13.1
Lane LOS	A	A		A	C	B
Approach Delay (s)	1.7	0.1		0.0	14.1	
Approach LOS				A	B	

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	69.4%	ICU Level of Service		C
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	470	155	75	780	30	10
Future Vol, veh/h	470	155	75	780	30	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	511	168	82	848	33	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	679	0	1606	595
Stage 1	-	-	-	-	595	-
Stage 2	-	-	-	-	1011	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	899	-	114	499
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	347	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	899	-	94	499
Mov Cap-2 Maneuver	-	-	-	-	94	-
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	287	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	52.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	118	-	-	899	-
HCM Lane V/C Ratio	0.368	-	-	0.091	-
HCM Control Delay (s)	52.3	-	-	9.4	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	460	10	10	815	10	20	0	10	10	0	20
Future Vol, veh/h	10	460	10	10	815	10	20	0	10	10	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	500	11	11	886	11	22	0	11	11	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	897	0	0	511	0	0	1451	1445	505	1446	1446	891
Stage 1	-	-	-	-	-	-	527	527	-	913	913	-
Stage 2	-	-	-	-	-	-	924	918	-	533	533	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	757	-	-	1054	-	-	109	132	567	109	132	341
Stage 1	-	-	-	-	-	-	535	528	-	328	352	-
Stage 2	-	-	-	-	-	-	323	350	-	531	525	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	757	-	-	1054	-	-	99	127	567	104	127	341
Mov Cap-2 Maneuver	-	-	-	-	-	-	99	127	-	104	127	-
Stage 1	-	-	-	-	-	-	524	517	-	321	345	-
Stage 2	-	-	-	-	-	-	296	343	-	510	515	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	39.3	27.3
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	137	757	-	-	1054	-	-	194
HCM Lane V/C Ratio	0.238	0.014	-	-	0.01	-	-	0.168
HCM Control Delay (s)	39.3	9.8	0	-	8.5	0	-	27.3
HCM Lane LOS	E	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	13.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	125	355	570	60	45	245
Future Vol, veh/h	125	355	570	60	45	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	386	620	65	49	266

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	685	0	-	0	1310	652
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	658	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	908	-	-	-	175	468
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	515	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	908	-	-	-	149	468
Mov Cap-2 Maneuver	-	-	-	-	149	-
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	438	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	60.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	908	-	-	-	351
HCM Lane V/C Ratio	0.15	-	-	-	0.898
HCM Control Delay (s)	9.7	-	-	-	60.7
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	8.9

Intersection	
Int Delay, s/veh	18.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	300	100	165	50	50	470
Future Vol, veh/h	300	100	165	50	50	470
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	326	109	179	54	54	511

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	234	0	-	0	968	207
Stage 1	-	-	-	-	207	-
Stage 2	-	-	-	-	761	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1333	-	-	-	282	833
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	461	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1333	-	-	-	213	833
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	348	-

Approach	EB	WB	SB
HCM Control Delay, s	6.4	0	36
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1333	-	-	-	651
HCM Lane V/C Ratio	0.245	-	-	-	0.868
HCM Control Delay (s)	8.6	-	-	-	36
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	1	-	-	-	10.2

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	270	445	35	45	75
Future Vol, veh/h	40	270	445	35	45	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	293	484	38	49	82

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	522	0	-	0	883	503
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	380	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1044	-	-	-	316	569
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1044	-	-	-	301	569
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	657	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1044	-	-	-	427
HCM Lane V/C Ratio	0.042	-	-	-	0.305
HCM Control Delay (s)	8.6	0	-	-	17.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.3

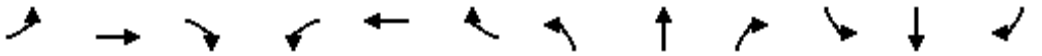
Intersection	
Int Delay, s/veh	34.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	255	55	15	225	30	150	90	65	70	40	110
Future Vol, veh/h	50	255	55	15	225	30	150	90	65	70	40	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	135	-	-	-	-	275	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	4	4	2	2	2	4	2	4
Mvmt Flow	54	277	60	16	245	33	163	98	71	76	43	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	0	337	0	0	775	693	307	777	723	245
Stage 1	-	-	-	-	-	-	416	416	-	277	277	-
Stage 2	-	-	-	-	-	-	359	277	-	500	446	-
Critical Hdwy	4.14	-	-	4.12	-	-	7.12	6.52	6.22	7.14	6.52	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.14	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.14	5.52	-
Follow-up Hdwy	2.236	-	-	2.218	-	-	3.518	4.018	3.318	3.536	4.018	3.336
Pot Cap-1 Maneuver	1309	-	-	1222	-	-	315	367	733	312	352	789
Stage 1	-	-	-	-	-	-	614	592	-	725	681	-
Stage 2	-	-	-	-	-	-	659	681	-	549	574	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1309	-	-	1222	-	-	230	346	733	211	332	789
Mov Cap-2 Maneuver	-	-	-	-	-	-	230	346	-	211	332	-
Stage 1	-	-	-	-	-	-	589	568	-	695	670	-
Stage 2	-	-	-	-	-	-	514	670	-	394	550	-

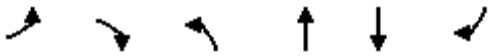
Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.4	114.8	19.3
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	305	1309	-	-	1222	-	-	211	577
HCM Lane V/C Ratio	1.087	0.042	-	-	0.013	-	-	0.361	0.283
HCM Control Delay (s)	114.8	7.9	-	-	8	0	-	31.4	13.7
HCM Lane LOS	F	A	-	-	A	A	-	D	B
HCM 95th %tile Q(veh)	12.9	0.1	-	-	0	-	-	1.6	1.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	25	135	10	10	10	70	470	20	15	460	145
Future Volume (vph)	255	25	135	10	10	10	70	470	20	15	460	145
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1547	1580		1547	1674		1547	1798		1547	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1547	1580		1547	1674		1547	1798		1547	1810	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	277	27	147	11	11	11	76	511	22	16	500	158
RTOR Reduction (vph)	0	124	0	0	11	0	0	1	0	0	0	89
Lane Group Flow (vph)	277	50	0	11	11	0	76	532	0	16	500	69
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	8.7	9.1		0.8	1.2		5.1	30.0		0.8	25.7	25.7
Effective Green, g (s)	8.7	9.1		0.8	1.2		5.1	30.0		0.8	25.7	25.7
Actuated g/C Ratio	0.15	0.16		0.01	0.02		0.09	0.51		0.01	0.44	0.44
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	229	244		21	34		134	918		21	792	673
v/s Ratio Prot	c0.18	c0.03		0.01	0.01		c0.05	c0.30		0.01	0.28	
v/s Ratio Perm												0.04
v/c Ratio	1.21	0.20		0.52	0.33		0.57	0.58		0.76	0.63	0.10
Uniform Delay, d1	25.0	21.6		28.8	28.4		25.7	10.0		28.9	12.8	9.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	127.8	0.4		21.6	5.6		5.4	0.9		92.1	1.6	0.1
Delay (s)	152.8	22.1		50.3	34.0		31.2	10.9		120.9	14.5	9.8
Level of Service	F	C		D	C		C	B		F	B	A
Approach Delay (s)		102.4			39.4			13.4			15.9	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	15	10	240	495	330	50
Future Volume (vph)	15	10	240	495	330	50
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3470	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3470	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	11	261	538	359	54
RTOR Reduction (vph)	0	10	0	0	11	0
Lane Group Flow (vph)	16	1	261	538	402	0
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	1.9	1.9	11.5	30.7	15.7	
Effective Green, g (s)	1.9	1.9	11.5	30.7	15.7	
Actuated g/C Ratio	0.05	0.05	0.28	0.74	0.38	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	73	72	442	1381	1315	
v/s Ratio Prot	c0.01		c0.16	c0.29	0.12	
v/s Ratio Perm		0.00				
v/c Ratio	0.22	0.01	0.59	0.39	0.31	
Uniform Delay, d1	19.0	18.8	12.9	1.9	9.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.0	1.4	0.4	0.3	
Delay (s)	19.6	18.9	14.3	2.3	9.3	
Level of Service	B	B	B	A	A	
Approach Delay (s)	19.3			6.2	9.3	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	41.4	Sum of lost time (s)	12.3
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	35	460	35	20	355
Future Vol, veh/h	25	35	460	35	20	355
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	27	38	500	38	22	386

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	949	520	0	0	539	0
Stage 1	520	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	288	554	-	-	1024	-
Stage 1	595	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	280	553	-	-	1024	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	594	-	-	-	-	-
Stage 2	637	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	482	1024	-
HCM Lane V/C Ratio	-	-	0.135	0.021	-
HCM Control Delay (s)	-	-	13.6	8.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	5	50	65	490	25	35	325
Future Vol, veh/h	5	50	65	490	25	35	325
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	0	-	-	0
Grade, %	-	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	2	3	3	3	3	3	3
Mvmt Flow	5	54	71	533	27	38	353

Major/Minor	Minor1			Major1		Major2	
Conflicting Flow All	0	975	546	0	0	560	0
Stage 1	0	546	-	-	-	-	-
Stage 2	0	429	-	-	-	-	-
Critical Hdwy	-	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	-	5.43	-	-	-	-	-
Critical Hdwy Stg 2	-	5.43	-	-	-	-	-
Follow-up Hdwy	-	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	0	278	536	-	-	1006	-
Stage 1	0	578	-	-	-	-	-
Stage 2	0	655	-	-	-	-	-
Platoon blocked, %	-			-	-		-
Mov Cap-1 Maneuver	0	265	536	-	-	1006	-
Mov Cap-2 Maneuver	0	395	-	-	-	-	-
Stage 1	0	578	-	-	-	-	-
Stage 2	0	624	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.6	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	464	1006	-
HCM Lane V/C Ratio	-	-	0.269	0.038	-
HCM Control Delay (s)	-	-	15.6	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

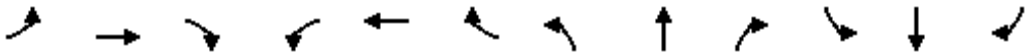
Intersection	
Int Delay, s/veh	16.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	10	10	65	10	135	10	425	100	120	300	10
Future Vol, veh/h	15	10	10	65	10	135	10	425	100	120	300	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	11	11	74	11	153	11	483	114	136	341	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1264	1238	347	1194	1188	540	352	0	0	597	0	0
Stage 1	619	619	-	563	563	-	-	-	-	-	-	-
Stage 2	645	619	-	631	625	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	146	176	696	163	188	542	1207	-	-	980	-	-
Stage 1	476	480	-	511	509	-	-	-	-	-	-	-
Stage 2	461	480	-	469	477	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	85	144	696	130	153	542	1207	-	-	980	-	-
Mov Cap-2 Maneuver	85	144	-	130	153	-	-	-	-	-	-	-
Stage 1	469	397	-	504	502	-	-	-	-	-	-	-
Stage 2	319	473	-	371	394	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.8	80.1	0.1	2.6
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1207	-	-	134	258	980	-	-
HCM Lane V/C Ratio	0.009	-	-	0.297	0.925	0.139	-	-
HCM Control Delay (s)	8	0	-	42.8	80.1	9.3	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	8.3	0.5	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	240	120	210	430	180	280	285	185	145	250	80
Future Volume (vph)	25	240	120	210	430	180	280	285	185	145	250	80
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1540	1593	3539	1548	1593	3307		1593	3394	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1540	1593	3539	1548	1593	3307		1593	3394	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	261	130	228	467	196	304	310	201	158	272	87
RTOR Reduction (vph)	0	0	105	0	0	118	0	98	0	0	31	0
Lane Group Flow (vph)	27	261	25	228	467	78	304	413	0	158	328	0
Confl. Peds. (#/hr)			1			9			4			6
Confl. Bikes (#/hr)			3			3			2			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.9	18.0	18.0	23.0	38.1	38.1	20.2	23.9		13.5	17.2	
Effective Green, g (s)	2.9	18.0	18.0	23.0	38.1	38.1	20.2	23.9		13.5	17.2	
Actuated g/C Ratio	0.03	0.19	0.19	0.24	0.40	0.40	0.21	0.25		0.14	0.18	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	48	667	290	384	1413	618	337	828		225	611	
v/s Ratio Prot	0.02	c0.07		c0.14	0.13		c0.19	c0.12		0.10	0.10	
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.56	0.39	0.08	0.59	0.33	0.13	0.90	0.50		0.70	0.54	
Uniform Delay, d1	45.6	33.9	31.9	32.1	19.8	18.1	36.6	30.6		39.0	35.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.7	0.8	0.3	6.6	0.3	0.2	25.5	1.0		7.8	1.7	
Delay (s)	54.3	34.7	32.2	38.7	20.1	18.3	62.2	31.6		46.9	37.1	
Level of Service	D	C	C	D	C	B	E	C		D	D	
Approach Delay (s)		35.2			24.5			43.0			40.1	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	50	10	10	105	10	25	5	100	540	80	25	455
Future Volume (vph)	50	10	10	105	10	25	5	100	540	80	25	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.93		1.00	0.89			1.00	0.98		1.00	0.98
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	1723		1770	1664			1770	3471		1770	3474
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	1723		1770	1664			1770	3471		1770	3474
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	11	114	11	27	5	109	587	87	27	495
RTOR Reduction (vph)	0	10	0	0	23	0	0	0	10	0	0	8
Lane Group Flow (vph)	54	12	0	114	15	0	0	114	664	0	27	547
Confl. Peds. (#/hr)												
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	4.2	4.5		9.0	9.3			7.4	22.9		2.3	17.8
Effective Green, g (s)	4.2	4.5		9.0	9.3			7.4	22.9		2.3	17.8
Actuated g/C Ratio	0.07	0.08		0.16	0.16			0.13	0.40		0.04	0.31
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	131	136		280	272			231	1401		71	1090
v/s Ratio Prot	0.03	0.01		c0.06	c0.01			c0.06	c0.19		0.02	0.16
v/s Ratio Perm												
v/c Ratio	0.41	0.09		0.41	0.06			0.49	0.47		0.38	0.50
Uniform Delay, d1	25.1	24.2		21.5	20.0			22.9	12.5		26.5	15.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	0.3		1.0	0.1			1.7	0.3		3.4	0.4
Delay (s)	27.2	24.5		22.4	20.1			24.6	12.7		29.9	16.2
Level of Service	C	C		C	C			C	B		C	B
Approach Delay (s)		26.4			21.8				14.4			16.8
Approach LOS		C			C				B			B

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	55
Future Volume (vph)	55
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	60
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

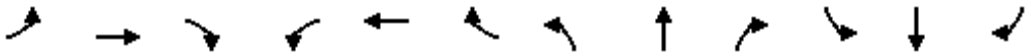
Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	145	560	15	35	425
Future Vol, veh/h	30	145	560	15	35	425
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	33	158	609	16	38	462

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	924	313	0	0	625	0
Stage 1	617	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.88	6.98	-	-	4.18	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.34	-	-	2.24	-
Pot Cap-1 Maneuver	265	677	-	-	939	-
Stage 1	495	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	251	677	-	-	939	-
Mov Cap-2 Maneuver	370	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	675	-	-	-	-	-

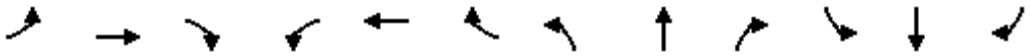
Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	593	939	-
HCM Lane V/C Ratio	-	-	0.321	0.041	-
HCM Control Delay (s)	-	-	13.9	9	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.4	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	10	80	20	25	25	120	600	25	20	350	160
Future Volume (vph)	180	10	80	20	25	25	120	600	25	20	350	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.95		1.00	0.99		1.00	0.95	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1722			1748		1593	3515		1593	3341	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1722			1748		1593	3515		1593	3341	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	11	87	22	27	27	130	652	27	22	380	174
RTOR Reduction (vph)	0	15	0	0	25	0	0	3	0	0	57	0
Lane Group Flow (vph)	0	279	0	0	51	0	130	676	0	22	497	0
Confl. Peds. (#/hr)			7						1			8
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		17.5			5.4		8.2	26.3		2.2	20.3	
Effective Green, g (s)		17.5			5.4		8.2	26.3		2.2	20.3	
Actuated g/C Ratio		0.26			0.08		0.12	0.39		0.03	0.30	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		443			139		192	1361		51	998	
v/s Ratio Prot		c0.16			c0.03		c0.08	c0.19		0.01	0.15	
v/s Ratio Perm												
v/c Ratio		0.63			0.37		0.68	0.50		0.43	0.50	
Uniform Delay, d1		22.3			29.6		28.6	15.8		32.2	19.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1			0.6		7.2	0.6		2.1	0.8	
Delay (s)		24.5			30.2		35.8	16.4		34.4	20.4	
Level of Service		C			C		D	B		C	C	
Approach Delay (s)		24.5			30.2			19.5			20.9	
Approach LOS		C			C			B			C	

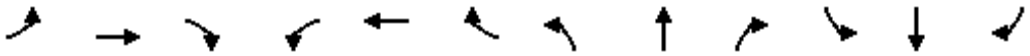
Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	65	60	45	0	10	40	775	60	190	665	60
Future Volume (vph)	75	65	60	45	0	10	40	775	60	190	665	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.92		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1755			1608		1593	3493		1593	3484	
Flt Permitted		0.86			0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1535			1327		1593	3493		1593	3484	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	85	74	68	51	0	11	45	881	68	216	756	68
RTOR Reduction (vph)	0	10	0	0	59	0	0	5	0	0	6	0
Lane Group Flow (vph)	0	217	0	0	3	0	45	944	0	216	818	0
Confl. Peds. (#/hr)						149			6			10
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		27.3			4.6		17.7	36.7		18.7	37.7	
Effective Green, g (s)		27.3			4.6		17.7	36.7		18.7	37.7	
Actuated g/C Ratio		0.26			0.04		0.17	0.35		0.18	0.36	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		403			58		271	1235		286	1265	
v/s Ratio Prot							0.03	c0.27		c0.14	0.23	
v/s Ratio Perm		c0.14			c0.00							
v/c Ratio		0.54			0.05		0.17	0.76		0.76	0.65	
Uniform Delay, d1		32.8			47.5		36.7	29.7		40.4	27.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.1		1.3	3.9		9.6	2.0	
Delay (s)		33.5			47.6		38.1	33.6		50.0	29.5	
Level of Service		C			D		D	C		D	C	
Approach Delay (s)		33.5			47.6			33.8			33.8	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

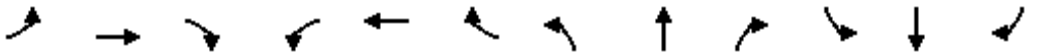
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	280	160	255	510	230	280	700	200	130	475	110
Future Volume (vph)	140	280	160	255	510	230	280	700	200	130	475	110
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1525	1593	3539	1529	1593	3395		1593	3424	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1525	1593	3539	1529	1593	3395		1593	3424	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	304	174	277	554	250	304	761	217	141	516	120
RTOR Reduction (vph)	0	0	117	0	0	126	0	17	0	0	15	0
Lane Group Flow (vph)	152	304	57	277	554	124	304	961	0	141	621	0
Confl. Peds. (#/hr)			24			21			19			8
Confl. Bikes (#/hr)			1			2			2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	10.3	24.4	24.4	23.8	37.9	37.9	17.2	31.8		14.7	29.0	
Effective Green, g (s)	10.3	24.4	24.4	23.8	37.9	37.9	17.2	31.8		14.7	29.0	
Actuated g/C Ratio	0.09	0.22	0.22	0.21	0.34	0.34	0.16	0.29		0.13	0.26	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	286	778	335	341	1209	522	247	973		211	895	
v/s Ratio Prot	0.05	0.09		c0.17	c0.16		c0.19	c0.28		0.09	0.18	
v/s Ratio Perm			0.04			0.08						
v/c Ratio	0.53	0.39	0.17	0.81	0.46	0.24	1.23	0.99		0.67	0.69	
Uniform Delay, d1	48.0	36.9	35.0	41.4	28.5	26.2	46.9	39.4		45.8	36.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.7	0.5	13.0	0.6	0.5	134.0	25.7		6.1	3.0	
Delay (s)	48.9	37.6	35.6	54.4	29.1	26.6	180.8	65.1		51.9	39.9	
Level of Service	D	D	D	D	C	C	F	E		D	D	
Approach Delay (s)		39.8			35.0			92.5			42.1	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	56.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	95	80	565	85	230	50	550	415	360	800	20
Future Volume (vph)	20	95	80	565	85	230	50	550	415	360	800	20
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1562	3471	1533	3030	1601	1456	1562	3471	1544	3030	3471	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1562	3471	1533	3030	1601	1456	1562	3471	1544	3030	3471	1520
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	99	83	589	89	240	52	573	432	375	833	21
RTOR Reduction (vph)	0	0	70	0	0	0	0	0	135	0	0	14
Lane Group Flow (vph)	21	99	13	589	171	158	52	573	297	375	833	7
Confl. Peds. (#/hr)			1									1
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	18.4	18.4	18.4	30.4	30.4	30.4	8.9	26.8	57.2	19.9	37.8	37.8
Effective Green, g (s)	18.4	18.4	18.4	30.4	30.4	30.4	8.9	26.8	57.2	19.9	37.8	37.8
Actuated g/C Ratio	0.16	0.16	0.16	0.26	0.26	0.26	0.08	0.23	0.49	0.17	0.33	0.33
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	248	552	244	796	421	382	120	804	763	521	1134	497
v/s Ratio Prot	0.01	c0.03		c0.19	0.11		0.03	0.17	0.10	c0.12	c0.24	
v/s Ratio Perm			0.01			0.11			0.09			0.00
v/c Ratio	0.08	0.18	0.05	0.74	0.41	0.41	0.43	0.71	0.39	0.72	0.73	0.01
Uniform Delay, d1	41.4	42.1	41.2	39.0	35.2	35.2	50.9	40.9	18.3	45.2	34.5	26.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	3.6	0.6	0.7	2.5	3.7	0.3	4.7	3.0	0.0
Delay (s)	41.6	42.2	41.3	42.6	35.8	36.0	53.4	44.6	18.6	50.0	37.5	26.3
Level of Service	D	D	D	D	D	D	D	D	B	D	D	C
Approach Delay (s)		41.8			40.2			34.4			41.1	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	115.6	Sum of lost time (s)	20.1
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	20	55	645	100	5	535	690	50	80	60	435	100
Future Volume (vph)	20	55	645	100	5	535	690	50	80	60	435	100
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1900	1900	1710
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	60	701	109	5	582	750	54	87	65	473	109
RTOR Reduction (vph)	0	0	0	72	0	0	0	25	0	0	422	0
Lane Group Flow (vph)	0	82	701	37	0	587	750	29	87	65	51	109
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2				6			3	
Actuated Green, G (s)		9.6	31.0	31.0		37.0	58.4	58.4	11.8	11.8	11.8	12.3
Effective Green, g (s)		9.6	31.0	31.0		37.0	58.4	58.4	11.8	11.8	11.8	12.3
Actuated g/C Ratio		0.09	0.28	0.28		0.34	0.53	0.53	0.11	0.11	0.11	0.11
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		136	981	439		527	1849	810	168	196	167	175
v/s Ratio Prot		0.05	c0.20			c0.38	0.22		c0.06	0.04		c0.07
v/s Ratio Perm				0.02				0.02			0.03	
v/c Ratio		0.60	0.71	0.08		1.11	0.41	0.04	0.52	0.33	0.30	0.62
Uniform Delay, d1		48.2	35.3	28.9		36.3	15.3	12.2	46.2	45.3	45.1	46.4
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.1	4.4	0.3		74.3	0.6	0.1	1.1	0.4	0.4	4.9
Delay (s)		53.2	39.8	29.2		110.6	15.9	12.3	47.3	45.6	45.5	51.3
Level of Service		D	D	C		F	B	B	D	D	D	D
Approach Delay (s)			39.7				55.7			45.8		
Approach LOS			D				E			D		

Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	109.6	Sum of lost time (s)	17.5
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

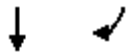


Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	75	50
Future Volume (vph)	75	50
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.94	
Flt Protected	1.00	
Satd. Flow (prot)	1718	
Flt Permitted	1.00	
Satd. Flow (perm)	1718	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	82	54
RTOR Reduction (vph)	19	0
Lane Group Flow (vph)	117	0
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	12.3	
Effective Green, g (s)	12.3	
Actuated g/C Ratio	0.11	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	192	
v/s Ratio Prot	0.07	
v/s Ratio Perm		
v/c Ratio	0.61	
Uniform Delay, d1	46.4	
Progression Factor	1.00	
Incremental Delay, d2	4.0	
Delay (s)	50.4	
Level of Service	D	
Approach Delay (s)	50.8	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	50	1060	10	5	10	1155	235	15	20	15	380
Future Volume (vph)	5	50	1060	10	5	10	1155	235	15	20	15	380
Ideal Flow (vphpl)	1900	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		0.96		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (prot)		1577	3500			1577	3505	1532		1738		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (perm)		1577	3500			1577	3505	1532		1738		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	54	1152	11	5	11	1255	255	16	22	16	413
RTOR Reduction (vph)	0	0	1	0	0	0	0	159	0	14	0	0
Lane Group Flow (vph)	0	59	1162	0	0	16	1255	96	0	40	0	0
Confl. Peds. (#/hr)								1			1	
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		6.5	41.6			2.4	37.1	37.1		9.8		
Effective Green, g (s)		6.5	41.6			2.4	37.1	37.1		9.8		
Actuated g/C Ratio		0.07	0.42			0.02	0.38	0.38		0.10		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		104	1484			38	1325	579		173		
v/s Ratio Prot		c0.04	0.33			0.01	c0.36			c0.02		
v/s Ratio Perm								0.06				
v/c Ratio		0.57	0.78			0.42	0.95	0.17		0.23		
Uniform Delay, d1		44.4	24.4			47.2	29.6	20.2		40.7		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		4.2	3.9			2.7	14.9	0.5		0.3		
Delay (s)		48.6	28.3			49.9	44.5	20.8		40.9		
Level of Service		D	C			D	D	C		D		
Approach Delay (s)			29.2				40.5			40.9		
Approach LOS			C				D			D		

Intersection Summary			
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	98.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	45
Future Volume (vph)	10	45
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	0.96	
Satd. Flow (prot)	1731	
Flt Permitted	0.96	
Satd. Flow (perm)	1731	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	11	49
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	470	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	33%	3%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	26.5	
Effective Green, g (s)	26.5	
Actuated g/C Ratio	0.27	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	467	
v/s Ratio Prot	c0.27	
v/s Ratio Perm		
v/c Ratio	1.01	
Uniform Delay, d1	35.8	
Progression Factor	1.00	
Incremental Delay, d2	43.3	
Delay (s)	79.1	
Level of Service	E	
Approach Delay (s)	79.1	
Approach LOS	E	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	30	1430	10	5	30	1395	65	15	0	20	40
Future Volume (vph)	5	30	1430	10	5	30	1395	65	15	0	20	40
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1547	3434			1547	3411			1619		
Flt Permitted		0.95	1.00			0.95	1.00			0.88		
Satd. Flow (perm)		1547	3434			1547	3411			1462		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	31	1474	10	5	31	1438	67	15	0	21	41
RTOR Reduction (vph)	0	0	0	0	0	0	2	0	0	34	0	0
Lane Group Flow (vph)	0	36	1484	0	0	36	1503	0	0	2	0	0
Confl. Peds. (#/hr)				1				4			4	
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		4.7	65.6			4.7	65.6			6.0		
Effective Green, g (s)		4.7	65.6			4.7	65.6			6.0		
Actuated g/C Ratio		0.05	0.73			0.05	0.73			0.07		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		80	2503			80	2486			97		
v/s Ratio Prot		c0.02	0.43			0.02	c0.44					
v/s Ratio Perm										0.00		
v/c Ratio		0.45	0.59			0.45	0.60			0.02		
Uniform Delay, d1		41.4	5.8			41.4	5.9			39.3		
Progression Factor		1.00	1.00			1.22	1.28			1.00		
Incremental Delay, d2		1.5	1.0			1.0	0.7			0.0		
Delay (s)		42.9	6.9			51.4	8.3			39.3		
Level of Service		D	A			D	A			D		
Approach Delay (s)			7.7				9.3			39.3		
Approach LOS			A				A			D		

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	25
Future Volume (vph)	0	25
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	0.99	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1655	
Flt Permitted	0.79	
Satd. Flow (perm)	1351	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	0	26
RTOR Reduction (vph)	63	0
Lane Group Flow (vph)	4	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	5%	5%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	6.0	
Effective Green, g (s)	6.0	
Actuated g/C Ratio	0.07	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	90	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.05	
Uniform Delay, d1	39.3	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	39.4	
Level of Service	D	
Approach Delay (s)	39.4	
Approach LOS	D	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	165	1270	25	5	30	1120	235	30	25	40	475	15
Future Volume (vph)	165	1270	25	5	30	1120	235	30	25	40	475	15
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (prot)	1577	3493			1752	3505	1568		1796	1568	1498	1674
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (perm)	1577	3493			1752	3505	1568		1796	1568	1498	1674
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	170	1309	26	5	31	1155	242	31	26	41	490	15
RTOR Reduction (vph)	0	1	0	0	0	0	146	0	0	39	0	0
Lane Group Flow (vph)	170	1334	0	0	36	1155	96	0	57	2	250	255
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	13.6	46.8			3.4	35.6	35.6		5.0	5.0	18.1	18.1
Effective Green, g (s)	13.6	46.8			3.4	35.6	35.6		5.0	5.0	18.1	18.1
Actuated g/C Ratio	0.15	0.52			0.04	0.40	0.40		0.06	0.06	0.20	0.20
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	238	1816			66	1386	620		99	87	301	336
v/s Ratio Prot	c0.11	0.38			0.02	c0.33			c0.03		c0.17	0.15
v/s Ratio Perm							0.06			0.00		
v/c Ratio	0.71	0.73			0.55	0.83	0.16		0.58	0.03	0.83	0.76
Uniform Delay, d1	36.4	16.8			42.5	24.5	17.5		41.5	40.2	34.5	33.9
Progression Factor	1.13	0.69			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	2.3			4.9	6.0	0.5		5.0	0.0	16.7	8.4
Delay (s)	48.1	13.8			47.4	30.5	18.1		46.4	40.2	51.2	42.3
Level of Service	D	B			D	C	B		D	D	D	D
Approach Delay (s)		17.7				28.9			43.8			40.2
Approach LOS		B				C			D			D

Intersection Summary			
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	315
Future Volume (vph)	315
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	325
RTOR Reduction (vph)	260
Lane Group Flow (vph)	65
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	18.1
Effective Green, g (s)	18.1
Actuated g/C Ratio	0.20
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	315
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.21
Uniform Delay, d1	30.0
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	30.1
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

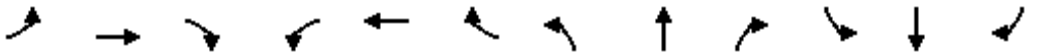
Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1770	20	5	1390	0	30
Future Vol, veh/h	1770	20	5	1390	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1924	22	5	1511	0	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1946	0	-	973
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	5.34	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.12	-	-	3.92
Pot Cap-1 Maneuver	-	-	133	-	0	216
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	133	-	-	216
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	24.6
HCM LOS			C

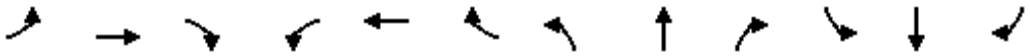
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	216	-	-	133	-
HCM Lane V/C Ratio	0.151	-	-	0.041	-
HCM Control Delay (s)	24.6	-	-	33.2	-
HCM Lane LOS	C	-	-	D	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1225	545	340	830	0	0	0	0	285	0	520
Future Volume (vph)	0	1225	545	340	830	0	0	0	0	285	0	520
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6346	1532	1577	3505						1752	1568
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6346	1532	1577	3505						1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1303	580	362	883	0	0	0	0	303	0	553
RTOR Reduction (vph)	0	0	342	0	0	0	0	0	0	0	0	177
Lane Group Flow (vph)	0	1303	238	362	883	0	0	0	0	0	303	376
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		29.6	29.6	20.9	54.7						15.5	15.5
Effective Green, g (s)		29.6	29.6	20.9	54.7						15.5	15.5
Actuated g/C Ratio		0.37	0.37	0.26	0.68						0.19	0.19
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2350	567	412	2399						339	304
v/s Ratio Prot		c0.21		c0.23	0.25						0.17	
v/s Ratio Perm			0.16									c0.24
v/c Ratio		0.55	0.42	0.88	0.37						0.89	1.24
Uniform Delay, d1		19.9	18.8	28.3	5.3						31.4	32.2
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.7	18.2	0.1						24.3	131.2
Delay (s)		20.3	19.4	46.5	5.4						55.7	163.4
Level of Service		C	B	D	A						E	F
Approach Delay (s)		20.0			17.4			0.0			125.3	
Approach LOS		C			B			A			F	

Intersection Summary					
HCM 2000 Control Delay	41.8	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	79.9	Sum of lost time (s)	13.9		
Intersection Capacity Utilization	82.3%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	580	915	0	0	855	380	325	5	295	0	0	0
Future Volume (vph)	580	915	0	0	855	380	325	5	295	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1758	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1758	1568			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	611	963	0	0	900	400	342	5	311	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	161	0	0	105	0	0	0
Lane Group Flow (vph)	611	963	0	0	900	239	0	347	206	0	0	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	21.7	58.3			32.4	32.4		22.0	22.0			
Effective Green, g (s)	21.7	58.3			32.4	32.4		22.0	22.0			
Actuated g/C Ratio	0.24	0.65			0.36	0.36		0.24	0.24			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	737	2270			1261	564		429	383			
v/s Ratio Prot	c0.20	0.27			c0.26			c0.20				
v/s Ratio Perm						0.15			0.13			
v/c Ratio	0.83	0.42			0.71	0.42		0.81	0.54			
Uniform Delay, d1	32.4	7.7			24.8	21.7		32.0	29.6			
Progression Factor	1.00	1.00			1.30	1.82		1.00	1.00			
Incremental Delay, d2	7.3	0.6			2.5	1.6		10.8	1.5			
Delay (s)	39.7	8.3			34.6	41.2		42.9	31.1			
Level of Service	D	A			C	D		D	C			
Approach Delay (s)		20.5			36.6			37.3			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	465	675	80	35	580	185	125	10	25	195	15
Future Volume (vph)	15	465	675	80	35	580	185	125	10	25	195	15
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.96			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3060	3505	1568	1577	3365			1763	1534		1763
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3060	3505	1568	1577	3365			1763	1534		1763
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	495	718	85	37	617	197	133	11	27	207	16
RTOR Reduction (vph)	0	0	0	44	0	26	0	0	0	23	0	0
Lane Group Flow (vph)	0	511	718	41	37	788	0	0	144	4	0	223
Confl. Peds. (#/hr)							3			9		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		17.2	43.7	43.7	3.4	29.0			12.1	12.1		13.6
Effective Green, g (s)		17.2	43.7	43.7	3.4	29.0			12.1	12.1		13.6
Actuated g/C Ratio		0.19	0.49	0.49	0.04	0.32			0.13	0.13		0.15
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		584	1701	761	59	1084			237	206		266
v/s Ratio Prot		c0.17	0.20		0.02	c0.23			c0.08			c0.13
v/s Ratio Perm				0.03						0.00		
v/c Ratio		0.88	0.42	0.05	0.63	0.73			0.61	0.02		0.84
Uniform Delay, d1		35.4	15.0	12.2	42.7	27.0			36.7	33.8		37.1
Progression Factor		0.92	1.14	2.27	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		12.3	0.7	0.1	14.0	4.3			3.0	0.0		19.3
Delay (s)		45.0	17.8	27.9	56.7	31.3			39.7	33.8		56.4
Level of Service		D	B	C	E	C			D	C		E
Approach Delay (s)			29.0			32.4			38.8			40.8
Approach LOS			C			C			D			D

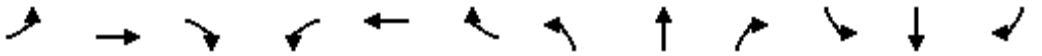
Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	540
Future Volume (vph)	540
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	574
RTOR Reduction (vph)	487
Lane Group Flow (vph)	87
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	13.6
Effective Green, g (s)	13.6
Actuated g/C Ratio	0.15
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	236
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.37
Uniform Delay, d1	34.3
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	34.7
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	805	5	5	705	25	10	5	5	20	0	80
Future Volume (Veh/h)	80	805	5	5	705	25	10	5	5	20	0	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	84	847	5	5	742	26	11	5	5	21	0	84
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.81			0.81	0.81	0.81	0.81	0.81	
vC, conflicting volume	768			852			1482	1796	850	1791	1785	384
vC1, stage 1 conf vol							1018	1018		765	765	
vC2, stage 2 conf vol							465	778		1026	1020	
vCu, unblocked vol	768			704			1478	1863	702	1858	1850	384
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			99			94	97	98	88	100	86
cM capacity (veh/h)	835			719			189	200	308	171	212	611

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	936	376	397	21	21	84
Volume Left	84	5	0	11	21	0
Volume Right	5	0	26	5	0	84
cSH	835	719	1700	211	171	611
Volume to Capacity	0.10	0.01	0.23	0.10	0.12	0.14
Queue Length 95th (ft)	8	1	0	8	10	12
Control Delay (s)	2.7	0.2	0.0	23.9	29.0	11.8
Lane LOS	A	A		C	D	B
Approach Delay (s)	2.7	0.1		23.9	15.3	
Approach LOS				C	C	

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	85.5%	ICU Level of Service		E
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	715	65	10	645	90	15
Future Vol, veh/h	715	65	10	645	90	15
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	753	68	11	679	95	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	822	0	1488	788
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	700	-
Critical Hdwy	-	-	4.14	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.236	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	799	-	135	388
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	799	-	132	388
Mov Cap-2 Maneuver	-	-	-	-	132	-
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	478	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	81.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	146	-	-	799	-
HCM Lane V/C Ratio	0.757	-	-	0.013	-
HCM Control Delay (s)	81.7	-	-	9.6	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	4.6	-	-	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	710	15	10	645	10	10	0	10	10	0	10
Future Vol, veh/h	20	710	15	10	645	10	10	0	10	10	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	747	16	11	679	11	11	0	11	11	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	689	0	0	763	0	0	1508	1508	755	1508	1510	684
Stage 1	-	-	-	-	-	-	797	797	-	705	705	-
Stage 2	-	-	-	-	-	-	711	711	-	803	805	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	905	-	-	850	-	-	99	121	409	99	120	449
Stage 1	-	-	-	-	-	-	380	399	-	427	439	-
Stage 2	-	-	-	-	-	-	424	436	-	377	395	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	905	-	-	850	-	-	92	114	409	92	113	449
Mov Cap-2 Maneuver	-	-	-	-	-	-	92	114	-	92	113	-
Stage 1	-	-	-	-	-	-	365	383	-	410	430	-
Stage 2	-	-	-	-	-	-	405	427	-	353	379	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	32.9	32.2
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	150	905	-	-	850	-	-	153
HCM Lane V/C Ratio	0.14	0.023	-	-	0.012	-	-	0.138
HCM Control Delay (s)	32.9	9.1	0	-	9.3	0	-	32.2
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	66.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	200	530	455	90	105	210
Future Vol, veh/h	200	530	455	90	105	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	217	576	495	98	114	228

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	592	0	-	0	1554	543
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	1011	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	984	-	-	-	125	540
Stage 1	-	-	-	-	582	-
Stage 2	-	-	-	-	352	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	984	-	-	-	~ 97	540
Mov Cap-2 Maneuver	-	-	-	-	~ 97	-
Stage 1	-	-	-	-	582	-
Stage 2	-	-	-	-	274	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	$ 331
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	984	-	-	-	214
HCM Lane V/C Ratio	0.221	-	-	-	1.6
HCM Control Delay (s)	9.7	-	-	-	$ 331
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.8	-	-	-	21.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	19.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	445	210	170	50	40	355
Future Vol, veh/h	445	210	170	50	40	355
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	484	228	185	54	43	386

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	239	0	-	0	1408	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	1196	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1328	-	-	-	153	828
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	287	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1328	-	-	-	97	828
Mov Cap-2 Maneuver	-	-	-	-	97	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	182	-

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	52.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1328	-	-	-	470
HCM Lane V/C Ratio	0.364	-	-	-	0.914
HCM Control Delay (s)	9.3	-	-	-	52.6
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	1.7	-	-	-	10.4

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	55	410	365	30	25	50
Future Vol, veh/h	55	410	365	30	25	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	423	376	31	26	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	407	0	-	0	928	392
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	536	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1152	-	-	-	297	657
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	587	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1152	-	-	-	278	657
Mov Cap-2 Maneuver	-	-	-	-	278	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	549	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1152	-	-	-	452
HCM Lane V/C Ratio	0.049	-	-	-	0.171
HCM Control Delay (s)	8.3	0	-	-	14.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

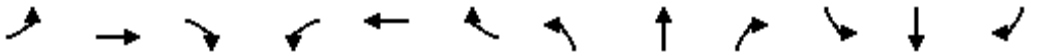
Intersection	
Int Delay, s/veh	15.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	105	190	115	40	250	55	80	90	30	45	40	80
Future Vol, veh/h	105	190	115	40	250	55	80	90	30	45	40	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	135	-	-	-	-	275	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	109	198	120	42	260	57	83	94	31	47	42	83

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	260	0	0	318	0	0	883	821	258	883	880	260
Stage 1	-	-	-	-	-	-	477	477	-	344	344	-
Stage 2	-	-	-	-	-	-	406	344	-	539	536	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1304	-	-	1242	-	-	266	309	781	266	286	779
Stage 1	-	-	-	-	-	-	569	556	-	671	637	-
Stage 2	-	-	-	-	-	-	622	637	-	527	523	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1304	-	-	1242	-	-	189	272	781	171	251	779
Mov Cap-2 Maneuver	-	-	-	-	-	-	189	272	-	171	251	-
Stage 1	-	-	-	-	-	-	521	510	-	615	611	-
Stage 2	-	-	-	-	-	-	496	611	-	378	479	-

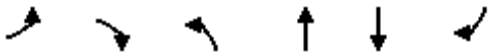
Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.9	63	20.7
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	252	1304	-	-	1242	-	-	171	458
HCM Lane V/C Ratio	0.827	0.084	-	-	0.034	-	-	0.274	0.273
HCM Control Delay (s)	63	8	-	-	8	0	-	33.8	15.8
HCM Lane LOS	F	A	-	-	A	A	-	D	C
HCM 95th %tile Q(veh)	6.5	0.3	-	-	0.1	-	-	1.1	1.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	10	70	20	20	25	165	505	20	15	505	180
Future Volume (vph)	150	10	70	20	20	25	165	505	20	15	505	180
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1619		1593	1709		1593	1852		1593	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1619		1593	1709		1593	1852		1593	1863	1549
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	11	76	22	22	27	179	549	22	16	549	196
RTOR Reduction (vph)	0	62	0	0	25	0	0	1	0	0	0	115
Lane Group Flow (vph)	163	25	0	22	24	0	179	570	0	16	549	81
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	10.6	13.4		2.2	5.0		10.6	40.1		1.4	30.9	30.9
Effective Green, g (s)	10.6	13.4		2.2	5.0		10.6	40.1		1.4	30.9	30.9
Actuated g/C Ratio	0.14	0.18		0.03	0.07		0.14	0.53		0.02	0.41	0.41
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	224	288		46	113		224	988		29	766	637
v/s Ratio Prot	c0.10	0.02		0.01	c0.01		c0.11	0.31		0.01	c0.29	
v/s Ratio Perm												0.05
v/c Ratio	0.73	0.09		0.48	0.21		0.80	0.58		0.55	0.72	0.13
Uniform Delay, d1	30.9	25.7		35.9	33.2		31.2	11.8		36.5	18.4	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.2	0.1		7.6	0.9		17.8	0.8		20.8	3.2	0.1
Delay (s)	42.0	25.9		43.5	34.1		49.0	12.6		57.3	21.7	13.8
Level of Service	D	C		D	C		D	B		E	C	B
Approach Delay (s)		36.4			37.0			21.3			20.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	75.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	60	70	20	400	670	20
Future Volume (vph)	60	70	20	400	670	20
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3521	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3521	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	76	22	435	728	22
RTOR Reduction (vph)	0	66	0	0	1	0
Lane Group Flow (vph)	65	10	22	435	749	0
Confl. Peds. (#/hr)						1
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	5.2	5.2	1.0	27.1	22.6	
Effective Green, g (s)	5.2	5.2	1.0	27.1	22.6	
Actuated g/C Ratio	0.13	0.13	0.02	0.66	0.55	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	201	200	38	1228	1936	
v/s Ratio Prot	c0.04		0.01	c0.23	0.21	
v/s Ratio Perm		0.01				
v/c Ratio	0.32	0.05	0.58	0.35	0.39	
Uniform Delay, d1	16.3	15.8	19.8	3.1	5.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.0	12.6	0.4	0.3	
Delay (s)	16.7	15.8	32.4	3.5	5.5	
Level of Service	B	B	C	A	A	
Approach Delay (s)	16.2			4.9	5.5	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	41.1	Sum of lost time (s)	12.3
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	20	430	30	15	670
Future Vol, veh/h	30	20	430	30	15	670
Conflicting Peds, #/hr	0	1	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	22	467	33	16	728

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1246	486	0	0	501	0
Stage 1	485	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	192	581	-	-	1063	-
Stage 1	619	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	187	580	-	-	1062	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	449	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	389	1062	-
HCM Lane V/C Ratio	-	-	0.14	0.015	-
HCM Control Delay (s)	-	-	15.8	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	40	435	25	55	685
Future Vol, veh/h	20	40	435	25	55	685
Conflicting Peds, #/hr	0	2	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	43	473	27	60	745

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1352	490	0	0	502	0
Stage 1	488	-	-	-	-	-
Stage 2	864	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	165	578	-	-	1062	-
Stage 1	617	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	149	576	-	-	1060	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	616	-	-	-	-	-
Stage 2	373	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	421	1060	-
HCM Lane V/C Ratio	-	-	0.155	0.056	-
HCM Control Delay (s)	-	-	15.1	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

Intersection	
Int Delay, s/veh	40.5

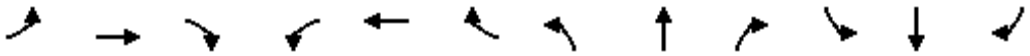
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	10	10	85	10	60	10	415	60	115	695	20
Future Vol, veh/h	15	10	10	85	10	60	10	415	60	115	695	20
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	11	11	92	11	65	11	451	65	125	755	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1563	1558	770	1536	1536	488	779	0	0	518	0	0
Stage 1	1018	1018	-	507	507	-	-	-	-	-	-	-
Stage 2	545	540	-	1029	1029	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	91	112	401	95	116	580	838	-	-	1048	-	-
Stage 1	286	315	-	548	539	-	-	-	-	-	-	-
Stage 2	523	521	-	282	311	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	60	86	399	~ 69	89	578	836	-	-	1046	-	-
Mov Cap-2 Maneuver	60	86	-	~ 69	89	-	-	-	-	-	-	-
Stage 1	280	248	-	537	528	-	-	-	-	-	-	-
Stage 2	445	510	-	207	245	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	72.8	$ 369.3	0.2	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	836	-	-	89	107	1046	-	-
HCM Lane V/C Ratio	0.013	-	-	0.427	1.575	0.12	-	-
HCM Control Delay (s)	9.4	0	-	72.8	$ 369.3	8.9	0	-
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.8	12.7	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	540	310	270	420	130	160	340	190	215	400	50
Future Volume (vph)	50	540	310	270	420	130	160	340	190	215	400	50
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.5	4.5	3.5	4.5		3.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1540	1593	3539	1563	1593	3331		1593	3475	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1540	1593	3539	1563	1593	3331		1593	3475	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	587	337	293	457	141	174	370	207	234	435	54
RTOR Reduction (vph)	0	0	259	0	0	85	0	86	0	0	11	0
Lane Group Flow (vph)	54	587	78	293	457	56	174	491	0	234	478	0
Confl. Peds. (#/hr)			3						2			2
Confl. Bikes (#/hr)			2			2			1			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.1	20.2	20.2	18.2	34.3	34.3	12.1	17.2		15.2	20.3	
Effective Green, g (s)	4.1	20.2	20.2	18.2	34.3	34.3	12.1	17.2		15.2	20.3	
Actuated g/C Ratio	0.05	0.23	0.23	0.21	0.40	0.40	0.14	0.20		0.18	0.23	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	75	823	358	334	1398	617	222	660		278	812	
v/s Ratio Prot	0.03	c0.17		c0.18	0.13		0.11	c0.15		c0.15	c0.14	
v/s Ratio Perm			0.05			0.04						
v/c Ratio	0.72	0.71	0.22	0.88	0.33	0.09	0.78	0.74		0.84	0.59	
Uniform Delay, d1	40.8	30.6	26.9	33.2	18.2	16.5	36.1	32.7		34.6	29.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.9	2.5	0.1	21.3	0.1	0.0	15.2	4.0		19.3	0.7	
Delay (s)	64.7	33.1	27.0	54.5	18.3	16.5	51.3	36.7		53.9	30.3	
Level of Service	E	C	C	D	B	B	D	D		D	C	
Approach Delay (s)		32.7			29.9			40.1			37.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	45	30	15	190	30	50	5	90	555	165	40	700
Future Volume (vph)	45	30	15	190	30	50	5	90	555	165	40	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frt	1.00	0.95		1.00	0.91			1.00	0.97		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	1772		1770	1689			1770	3418		1770	3507
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	1772		1770	1689			1770	3418		1770	3507
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	33	16	207	33	54	5	98	603	179	43	761
RTOR Reduction (vph)	0	15	0	0	43	0	0	0	22	0	0	4
Lane Group Flow (vph)	49	34	0	207	44	0	0	103	760	0	43	806
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	4.3	4.0		14.6	14.3			7.7	28.5		4.1	24.9
Effective Green, g (s)	4.3	4.0		14.6	14.3			7.7	28.5		4.1	24.9
Actuated g/C Ratio	0.06	0.06		0.21	0.21			0.11	0.41		0.06	0.36
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	109	102		373	349			196	1407		104	1261
v/s Ratio Prot	0.03	c0.02		c0.12	0.03			c0.06	c0.22		0.02	c0.23
v/s Ratio Perm												
v/c Ratio	0.45	0.33		0.55	0.13			0.53	0.54		0.41	0.64
Uniform Delay, d1	31.3	31.3		24.4	22.4			29.0	15.4		31.4	18.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.9	1.9		1.8	0.2			2.5	0.4		2.7	1.1
Delay (s)	34.2	33.2		26.2	22.5			31.6	15.8		34.0	19.5
Level of Service	C	C		C	C			C	B		C	B
Approach Delay (s)		33.7			25.1				17.7			20.2
Approach LOS		C			C				B			C

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	49
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

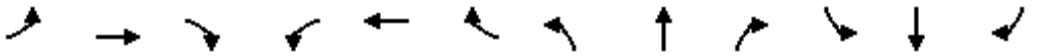
Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	50	600	15	60	740
Future Vol, veh/h	15	50	600	15	60	740
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	54	652	16	65	804

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1193	334	0	0	668	0
Stage 1	660	-	-	-	-	-
Stage 2	533	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	180	662	-	-	918	-
Stage 1	476	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	157	662	-	-	918	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	476	-	-	-	-	-
Stage 2	482	-	-	-	-	-

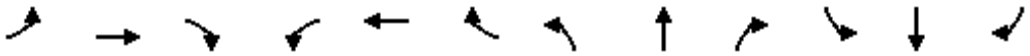
Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	511	918	-
HCM Lane V/C Ratio	-	-	0.138	0.071	-
HCM Control Delay (s)	-	-	13.2	9.2	0.5
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	10	90	20	15	20	55	565	20	25	710	110
Future Volume (vph)	110	10	90	20	15	20	55	565	20	25	710	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.95		1.00	0.99		1.00	0.98	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684			1712		1577	3484		1577	3423	
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1684			1712		1577	3484		1577	3423	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	118	11	97	22	16	22	59	608	22	27	763	118
RTOR Reduction (vph)	0	28	0	0	21	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	198	0	0	39	0	59	628	0	27	870	0
Confl. Peds. (#/hr)			1						1			4
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.8			3.7		4.3	29.6		2.3	27.6	
Effective Green, g (s)		13.8			3.7		4.3	29.6		2.3	27.6	
Actuated g/C Ratio		0.21			0.06		0.07	0.45		0.03	0.42	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		352			96		102	1564		55	1433	
v/s Ratio Prot		c0.12			c0.02		c0.04	0.18		0.02	c0.25	
v/s Ratio Perm												
v/c Ratio		0.56			0.41		0.58	0.40		0.49	0.61	
Uniform Delay, d1		23.3			30.0		29.9	12.2		31.2	14.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			1.0		4.9	0.3		2.5	1.1	
Delay (s)		24.6			31.1		34.8	12.5		33.7	16.0	
Level of Service		C			C		C	B		C	B	
Approach Delay (s)		24.6			31.1			14.4			16.5	
Approach LOS		C			C			B			B	

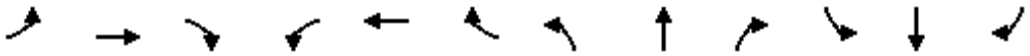
Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	5	30	15	0	5	30	800	10	25	800	35
Future Volume (vph)	40	5	30	15	0	5	30	800	10	25	800	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1706			1737		1593	3531		1593	3513	
Flt Permitted		0.82			0.70		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1438			1265		1593	3531		1593	3513	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	5	32	16	0	5	32	851	11	27	851	37
RTOR Reduction (vph)	0	19	0	0	19	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	61	0	0	2	0	32	861	0	27	885	0
Confl. Peds. (#/hr)			4						4			6
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		7.8			5.4		2.2	23.8		2.1	23.7	
Effective Green, g (s)		7.8			5.4		2.2	23.8		2.1	23.7	
Actuated g/C Ratio		0.14			0.10		0.04	0.43		0.04	0.43	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		201			122		63	1511		60	1497	
v/s Ratio Prot							c0.02	0.24		0.02	c0.25	
v/s Ratio Perm		c0.04			c0.00							
v/c Ratio		0.30			0.02		0.51	0.57		0.45	0.59	
Uniform Delay, d1		21.5			22.7		26.2	12.0		26.2	12.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.0		2.3	1.1		1.9	1.3	
Delay (s)		21.8			22.7		28.5	13.2		28.1	13.5	
Level of Service		C			C		C	B		C	B	
Approach Delay (s)		21.8			22.7			13.7			13.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	55.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	500	170	255	395	290	145	540	200	365	650	185
Future Volume (vph)	200	500	170	255	395	290	145	540	200	365	650	185
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1542	1593	3539	1543	1593	3366		1593	3397	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1542	1593	3539	1543	1593	3366		1593	3397	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	526	179	268	416	305	153	568	211	384	684	195
RTOR Reduction (vph)	0	0	76	0	0	209	0	27	0	0	17	0
Lane Group Flow (vph)	211	526	103	268	416	96	153	752	0	384	862	0
Confl. Peds. (#/hr)			11			10			14			15
Confl. Bikes (#/hr)			2			3			2			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	13.2	27.9	27.9	25.0	39.7	39.7	14.9	30.6		26.7	42.1	
Effective Green, g (s)	13.2	27.9	27.9	25.0	39.7	39.7	14.9	30.6		26.7	42.1	
Actuated g/C Ratio	0.10	0.22	0.22	0.20	0.31	0.31	0.12	0.24		0.21	0.33	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	322	781	340	315	1111	484	187	814		336	1131	
v/s Ratio Prot	0.07	c0.15		c0.17	0.12		0.10	c0.22		c0.24	0.25	
v/s Ratio Perm			0.07			0.06						
v/c Ratio	0.66	0.67	0.30	0.85	0.37	0.20	0.82	0.92		1.14	0.76	
Uniform Delay, d1	54.4	45.1	41.1	48.9	33.7	31.7	54.4	46.8		49.9	37.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	3.0	1.1	18.6	0.4	0.4	22.4	16.7		93.7	3.6	
Delay (s)	58.0	48.1	42.2	67.5	34.1	32.1	76.8	63.5		143.5	41.3	
Level of Service	E	D	D	E	C	C	E	E		F	D	
Approach Delay (s)		49.2			42.6			65.7			72.4	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	126.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	5	45	90	345	70	160	5	65	485	375	5
Future Volume (vph)	5	5	45	90	345	70	160	5	65	485	375	5
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710
Total Lost time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.94	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1593	3539	1562	3090	1660	1504		1593	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1593	3539	1562	3090	1660	1504		1593	3539	1583	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	5	46	93	356	72	165	5	67	500	387	5
RTOR Reduction (vph)	0	0	0	79	0	19	86	0	0	0	198	0
Lane Group Flow (vph)	0	10	46	14	356	104	28	0	72	500	189	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)				1								
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot
Protected Phases	8	8	8		7	7		1	1	6	7	5
Permitted Phases				8			7				6	
Actuated Green, G (s)		14.2	14.2	14.2	23.3	23.3	23.3		9.2	23.0	46.3	
Effective Green, g (s)		14.2	14.2	14.2	23.3	23.3	23.3		9.2	23.0	46.3	
Actuated g/C Ratio		0.15	0.15	0.15	0.25	0.25	0.25		0.10	0.24	0.49	
Clearance Time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	
Lane Grp Cap (vph)		238	530	233	759	407	369		154	858	773	
v/s Ratio Prot		0.01	c0.01		c0.12	0.06			0.05	c0.14	0.06	
v/s Ratio Perm				0.01			0.02				0.06	
v/c Ratio		0.04	0.09	0.06	0.47	0.26	0.08		0.47	0.58	0.24	
Uniform Delay, d1		34.5	34.7	34.6	30.5	28.8	27.5		40.5	31.7	14.1	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.1	0.1	0.5	0.3	0.1		2.2	1.6	0.2	
Delay (s)		34.6	34.8	34.7	30.9	29.1	27.6		42.7	33.2	14.3	
Level of Service		C	C	C	C	C	C		D	C	B	
Approach Delay (s)			34.7			29.9				26.3		
Approach LOS			C			C				C		

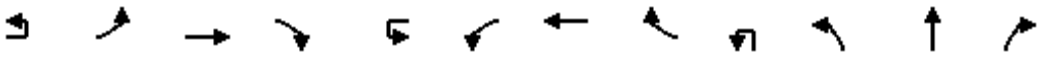
Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	20.1
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	195	450	20
Future Volume (vph)	195	450	20
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.1	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3090	3539	1537
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3090	3539	1537
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	201	464	21
RTOR Reduction (vph)	0	0	15
Lane Group Flow (vph)	206	464	6
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	14.2	28.0	28.0
Effective Green, g (s)	14.2	28.0	28.0
Actuated g/C Ratio	0.15	0.30	0.30
Clearance Time (s)	4.1	6.5	6.5
Vehicle Extension (s)	3.0	5.0	5.0
Lane Grp Cap (vph)	462	1045	453
v/s Ratio Prot	c0.07	0.13	
v/s Ratio Perm			0.00
v/c Ratio	0.45	0.44	0.01
Uniform Delay, d1	36.7	27.1	23.6
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.6	0.0
Delay (s)	37.4	27.7	23.7
Level of Service	D	C	C
Approach Delay (s)		30.5	
Approach LOS		C	

Intersection Summary



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	20	40	490	65	5	250	500	55	5	90	40	320
Future Volume (vph)	20	40	490	65	5	250	500	55	5	90	40	320
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1710	1900	1900
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00		1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1582	3505	1568		1577	3505	1568		1578	1845	1568
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1582	3505	1568		1577	3505	1568		1578	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	43	533	71	5	272	543	60	5	98	43	348
RTOR Reduction (vph)	0	0	0	48	0	0	0	30	0	0	0	302
Lane Group Flow (vph)	0	65	533	23	0	277	543	30	0	103	43	46
Heavy Vehicles (%)	2%	3%	3%	3%	2%	3%	3%	3%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	Split	NA	Perm
Protected Phases	5	5	2		1	1	6		3	3	3	
Permitted Phases				2				6				3
Actuated Green, G (s)		6.6	26.7	26.7		20.3	40.4	40.4		10.9	10.9	10.9
Effective Green, g (s)		6.6	26.7	26.7		20.3	40.4	40.4		10.9	10.9	10.9
Actuated g/C Ratio		0.08	0.33	0.33		0.25	0.49	0.49		0.13	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0		2.0	2.0	2.0
Lane Grp Cap (vph)		127	1139	509		389	1724	771		209	244	208
v/s Ratio Prot		0.04	c0.15			c0.18	0.15			c0.07	0.02	
v/s Ratio Perm				0.01				0.02				0.03
v/c Ratio		0.51	0.47	0.05		0.71	0.31	0.04		0.49	0.18	0.22
Uniform Delay, d1		36.2	22.0	19.0		28.2	12.5	10.8		33.0	31.6	31.8
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		1.4	1.3	0.2		5.1	0.5	0.1		0.7	0.1	0.2
Delay (s)		37.7	23.3	19.1		33.3	13.0	10.9		33.7	31.7	32.0
Level of Service		D	C	B		C	B	B		C	C	C
Approach Delay (s)			24.3				19.2				32.3	
Approach LOS			C				B				C	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

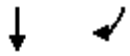


Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	55	40	25
Future Volume (vph)	55	40	25
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.5	4.5	
Lane Util. Factor	1.00	1.00	
Frt	1.00	0.94	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1577	1738	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1577	1738	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	60	43	27
RTOR Reduction (vph)	0	18	0
Lane Group Flow (vph)	60	52	0
Heavy Vehicles (%)	3%	3%	3%
Turn Type	Split	NA	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)	6.7	6.7	
Effective Green, g (s)	6.7	6.7	
Actuated g/C Ratio	0.08	0.08	
Clearance Time (s)	4.5	4.5	
Vehicle Extension (s)	2.0	2.0	
Lane Grp Cap (vph)	128	141	
v/s Ratio Prot	c0.04	0.03	
v/s Ratio Perm			
v/c Ratio	0.47	0.37	
Uniform Delay, d1	36.0	35.7	
Progression Factor	1.00	1.00	
Incremental Delay, d2	1.0	0.6	
Delay (s)	37.0	36.3	
Level of Service	D	D	
Approach Delay (s)		36.6	
Approach LOS		D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	70	800	0	5	10	735	170	5	5	0	165
Future Volume (vph)	5	70	800	0	5	10	735	170	5	5	0	165
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		1.00		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (prot)		1593	3539			1593	3539	1550		1817		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (perm)		1593	3539			1593	3539	1550		1817		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	73	833	0	5	10	766	177	5	5	0	172
RTOR Reduction (vph)	0	0	0	0	0	0	0	102	0	0	0	0
Lane Group Flow (vph)	0	78	833	0	0	15	766	75	0	10	0	0
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		6.6	35.7			0.9	29.6	29.6		0.8		
Effective Green, g (s)		6.6	35.7			0.9	29.6	29.6		0.8		
Actuated g/C Ratio		0.09	0.51			0.01	0.42	0.42		0.01		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		149	1797			20	1490	652		20		
v/s Ratio Prot		c0.05	0.24			0.01	c0.22			c0.01		
v/s Ratio Perm								0.05				
v/c Ratio		0.52	0.46			0.75	0.51	0.11		0.50		
Uniform Delay, d1		30.4	11.1			34.6	15.0	12.4		34.6		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		1.5	0.8			83.6	1.1	0.3		7.0		
Delay (s)		31.9	11.9			118.2	16.1	12.7		41.5		
Level of Service		C	B			F	B	B		D		
Approach Delay (s)			13.6				17.1			41.5		
Approach LOS			B				B			D		

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	18.2
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

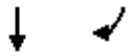


Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	20	70
Future Volume (vph)	20	70
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.96	
Flt Protected	0.97	
Satd. Flow (prot)	1738	
Flt Permitted	0.97	
Satd. Flow (perm)	1738	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	21	73
RTOR Reduction (vph)	11	0
Lane Group Flow (vph)	255	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	15.1	
Effective Green, g (s)	15.1	
Actuated g/C Ratio	0.21	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	373	
v/s Ratio Prot	c0.15	
v/s Ratio Perm		
v/c Ratio	0.68	
Uniform Delay, d1	25.4	
Progression Factor	1.00	
Incremental Delay, d2	4.1	
Delay (s)	29.5	
Level of Service	C	
Approach Delay (s)	29.5	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	25	930	30	5	25	835	40	15	0	20	45
Future Volume (vph)	5	25	930	30	5	25	835	40	15	0	20	45
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1593	3523			1593	3511			1684		
Flt Permitted		0.95	1.00			0.95	1.00			0.89		
Satd. Flow (perm)		1593	3523			1593	3511			1533		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	26	969	31	5	26	870	42	16	0	21	47
RTOR Reduction (vph)	0	0	2	0	0	0	2	0	0	34	0	0
Lane Group Flow (vph)	0	31	998	0	0	31	910	0	0	3	0	0
Confl. Bikes (#/hr)								2				
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		2.4	33.4			2.2	33.2			4.5		
Effective Green, g (s)		2.4	33.4			2.2	33.2			4.5		
Actuated g/C Ratio		0.04	0.62			0.04	0.62			0.08		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		71	2187			65	2166			128		
v/s Ratio Prot		c0.02	c0.28			0.02	0.26					
v/s Ratio Perm										0.00		
v/c Ratio		0.44	0.46			0.48	0.42			0.02		
Uniform Delay, d1		25.0	5.4			25.2	5.3			22.6		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		1.6	0.6			2.0	0.5			0.0		
Delay (s)		26.6	6.0			27.2	5.8			22.7		
Level of Service		C	A			C	A			C		
Approach Delay (s)			6.6				6.5			22.7		
Approach LOS			A				A			C		

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	13.7
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	60
Future Volume (vph)	0	60
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.92	
Flt Protected	0.98	
Satd. Flow (prot)	1683	
Flt Permitted	0.84	
Satd. Flow (perm)	1452	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	0	62
RTOR Reduction (vph)	97	0
Lane Group Flow (vph)	13	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	4.5	
Effective Green, g (s)	4.5	
Actuated g/C Ratio	0.08	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	121	
v/s Ratio Prot		
v/s Ratio Perm	c0.01	
v/c Ratio	0.11	
Uniform Delay, d1	22.8	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	22.9	
Level of Service	C	
Approach Delay (s)	22.9	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	135	830	10	5	15	730	175	10	20	20	5	175
Future Volume (vph)	135	830	10	5	15	730	175	10	20	20	5	175
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1710
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00		0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (prot)	1593	3532			1593	3539	1564		1833	1583		1513
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (perm)	1593	3532			1593	3539	1564		1833	1583		1513
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	141	865	10	5	16	760	182	10	21	21	5	182
RTOR Reduction (vph)	0	0	0	0	0	0	85	0	0	20	0	0
Lane Group Flow (vph)	141	875	0	0	21	760	97	0	31	1	0	98
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			1				1					
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	Split
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	11.9	58.7			2.1	47.9	47.9		3.1	3.1		9.4
Effective Green, g (s)	11.9	58.7			2.1	47.9	47.9		3.1	3.1		9.4
Actuated g/C Ratio	0.13	0.65			0.02	0.53	0.53		0.03	0.03		0.10
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2		0.2
Lane Grp Cap (vph)	210	2303			37	1883	832		63	54		158
v/s Ratio Prot	c0.09	0.25			0.01	c0.21			c0.02			c0.06
v/s Ratio Perm							0.06			0.00		
v/c Ratio	0.67	0.38			0.57	0.40	0.12		0.49	0.01		0.62
Uniform Delay, d1	37.2	7.2			43.5	12.5	10.5		42.7	42.0		38.6
Progression Factor	1.00	1.00			1.20	0.60	0.52		1.00	1.00		1.00
Incremental Delay, d2	6.5	0.5			10.6	0.6	0.3		2.2	0.0		5.3
Delay (s)	43.7	7.7			62.9	8.2	5.7		44.9	42.0		43.9
Level of Service	D	A			E	A	A		D	D		D
Approach Delay (s)		12.7				8.9			43.7			
Approach LOS		B				A			D			

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	175
Future Volume (vph)	10	175
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.4	4.4
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.96	1.00
Satd. Flow (prot)	1693	1558
Flt Permitted	0.96	1.00
Satd. Flow (perm)	1693	1558
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	10	182
RTOR Reduction (vph)	0	163
Lane Group Flow (vph)	99	19
Confl. Peds. (#/hr)		2
Confl. Bikes (#/hr)		1
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	9.4	9.4
Effective Green, g (s)	9.4	9.4
Actuated g/C Ratio	0.10	0.10
Clearance Time (s)	4.4	4.4
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	176	162
v/s Ratio Prot	0.06	
v/s Ratio Perm		0.01
v/c Ratio	0.56	0.12
Uniform Delay, d1	38.3	36.5
Progression Factor	1.00	1.00
Incremental Delay, d2	2.4	0.1
Delay (s)	40.8	36.7
Level of Service	D	D
Approach Delay (s)	39.6	
Approach LOS	D	

Intersection Summary

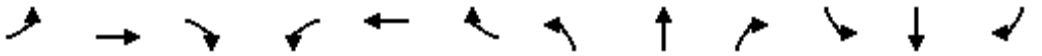
Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	1030	0	5	35	935	0	35
Future Vol, veh/h	1030	0	5	35	935	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	50	-	-	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1051	0	5	36	954	0	36

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	767	1051	0	-	526
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	-	5.64	5.34	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.32	3.12	-	-	3.92
Pot Cap-1 Maneuver	-	-	591	370	-	0	425
Stage 1	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	0	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	385	385	-	-	425
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-

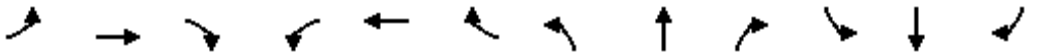
Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	425	-	-	385	-
HCM Lane V/C Ratio	0.084	-	-	0.106	-
HCM Control Delay (s)	14.2	-	-	15.4	-
HCM Lane LOS	B	-	-	C	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	-



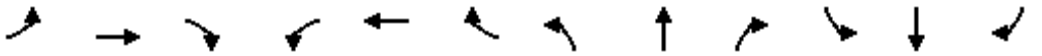
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	835	230	220	595	0	0	0	0	170	0	380
Future Volume (vph)	0	835	230	220	595	0	0	0	0	170	0	380
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6408	1549	1593	3539						1770	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6408	1549	1593	3539						1770	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	852	235	224	607	0	0	0	0	173	0	388
RTOR Reduction (vph)	0	0	113	0	0	0	0	0	0	0	0	314
Lane Group Flow (vph)	0	852	122	224	607	0	0	0	0	0	173	74
Confl. Peds. (#/hr)			1									
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		46.7	46.7	16.4	67.3						13.0	13.0
Effective Green, g (s)		46.7	46.7	16.4	67.3						13.0	13.0
Actuated g/C Ratio		0.52	0.52	0.18	0.75						0.14	0.14
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		3325	803	290	2646						255	228
v/s Ratio Prot		c0.13		c0.14	0.17						c0.10	
v/s Ratio Perm			0.08									0.05
v/c Ratio		0.26	0.15	0.77	0.23						0.68	0.32
Uniform Delay, d1		12.0	11.3	35.0	3.5						36.5	34.6
Progression Factor		0.82	1.23	0.78	1.81						1.00	1.00
Incremental Delay, d2		0.2	0.4	10.3	0.2						6.4	0.6
Delay (s)		10.1	14.3	37.8	6.5						42.9	35.2
Level of Service		B	B	D	A						D	D
Approach Delay (s)		11.0			14.9			0.0			37.5	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	550	0	0	605	300	220	0	240	0	0	0
Future Volume (vph)	450	550	0	0	605	300	220	0	240	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3090	3539			3539	1563		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3090	3539			3539	1563		1770	1583			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	469	573	0	0	630	312	229	0	250	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	154	0	0	201	0	0	0
Lane Group Flow (vph)	469	573	0	0	630	159	0	229	49	0	0	0
Confl. Peds. (#/hr)			3			1						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	17.7	62.7			40.8	40.8		17.6	17.6			
Effective Green, g (s)	17.7	62.7			40.8	40.8		17.6	17.6			
Actuated g/C Ratio	0.20	0.70			0.45	0.45		0.20	0.20			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	607	2465			1604	708		346	309			
v/s Ratio Prot	c0.15	0.16			c0.18			c0.13				
v/s Ratio Perm						0.10			0.03			
v/c Ratio	0.77	0.23			0.39	0.22		0.66	0.16			
Uniform Delay, d1	34.2	4.9			16.4	15.0		33.5	30.1			
Progression Factor	0.66	0.43			1.45	3.28		1.00	1.00			
Incremental Delay, d2	5.4	0.2			0.6	0.6		4.8	0.3			
Delay (s)	28.0	2.3			24.4	49.8		38.2	30.3			
Level of Service	C	A			C	D		D	C			
Approach Delay (s)		13.9			32.8			34.1			0.0	
Approach LOS		B			C			C			A	

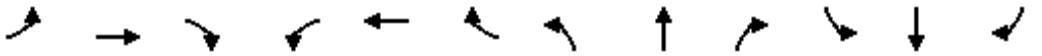
Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	350	405	20	20	485	135	30	30	10	120	40	360
Future Volume (vph)	350	405	20	20	485	135	30	30	10	120	40	360
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	1.00
Satd. Flow (prot)	3090	3539	1548	1593	3413			1817	1563		1796	1562
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	1.00
Satd. Flow (perm)	3090	3539	1548	1593	3413			1817	1563		1796	1562
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	372	431	21	21	516	144	32	32	11	128	43	383
RTOR Reduction (vph)	0	0	9	0	18	0	0	0	10	0	0	335
Lane Group Flow (vph)	372	431	12	21	642	0	0	64	1	0	171	48
Confl. Peds. (#/hr)			1			1			1			
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2						3			4
Actuated Green, G (s)	13.6	51.0	51.0	2.1	38.6			8.5	8.5		11.2	11.2
Effective Green, g (s)	13.6	51.0	51.0	2.1	38.6			8.5	8.5		11.2	11.2
Actuated g/C Ratio	0.15	0.57	0.57	0.02	0.43			0.09	0.09		0.12	0.12
Clearance Time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Vehicle Extension (s)	0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	466	2005	877	37	1463			171	147		223	194
v/s Ratio Prot	c0.12	0.12		0.01	c0.19			c0.04			c0.10	
v/s Ratio Perm			0.01						0.00			0.03
v/c Ratio	0.80	0.21	0.01	0.57	0.44			0.37	0.01		0.77	0.25
Uniform Delay, d1	36.9	9.6	8.5	43.5	18.1			38.3	36.9		38.1	35.6
Progression Factor	0.93	1.56	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.4	0.2	0.0	11.3	1.0			0.5	0.0		13.2	0.2
Delay (s)	42.6	15.2	8.5	54.8	19.0			38.8	36.9		51.3	35.8
Level of Service	D	B	A	D	B			D	D		D	D
Approach Delay (s)		27.4			20.1			38.5			40.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	465	5	0	520	30	10	0	5	15	0	90
Future Volume (Veh/h)	75	465	5	0	520	30	10	0	5	15	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	78	484	5	0	542	31	10	0	5	16	0	94
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	573			489			1008	1216	486	1205	1202	286
vC1, stage 1 conf vol							642	642		558	558	
vC2, stage 2 conf vol							365	573		648	645	
vCu, unblocked vol	573			384			956	1186	381	1174	1171	286
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			97	100	99	95	100	87
cM capacity (veh/h)	996			1061			331	328	559	322	352	710

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	567	271	302	15	16	94
Volume Left	78	0	0	10	16	0
Volume Right	5	0	31	5	0	94
cSH	996	1061	1700	383	322	710
Volume to Capacity	0.08	0.00	0.18	0.04	0.05	0.13
Queue Length 95th (ft)	6	0	0	3	4	11
Control Delay (s)	2.1	0.0	0.0	14.8	16.8	10.8
Lane LOS	A			B	C	B
Approach Delay (s)	2.1	0.0		14.8	11.7	
Approach LOS				B	B	

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	61.8%	ICU Level of Service		B
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	440	30	25	525	25	10
Future Vol, veh/h	440	30	25	525	25	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	463	32	26	553	26	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	495	0	1084	479
Stage 1	-	-	-	-	479	-
Stage 2	-	-	-	-	605	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1069	-	240	587
Stage 1	-	-	-	-	623	-
Stage 2	-	-	-	-	545	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1069	-	232	587
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	623	-
Stage 2	-	-	-	-	526	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	280	-	-	1069	-
HCM Lane V/C Ratio	0.132	-	-	0.025	-
HCM Control Delay (s)	19.8	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	425	15	5	515	40	5	0	20	65	0	30
Future Vol, veh/h	30	425	15	5	515	40	5	0	20	65	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	457	16	5	554	43	5	0	22	70	0	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	597	0	0	473	0	0	1132	1138	465	1126	1124	575
Stage 1	-	-	-	-	-	-	530	530	-	586	586	-
Stage 2	-	-	-	-	-	-	602	608	-	540	538	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	980	-	-	1089	-	-	180	201	597	182	205	518
Stage 1	-	-	-	-	-	-	533	527	-	496	497	-
Stage 2	-	-	-	-	-	-	486	486	-	526	522	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	980	-	-	1089	-	-	162	191	597	169	195	518
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	191	-	169	195	-
Stage 1	-	-	-	-	-	-	510	504	-	474	494	-
Stage 2	-	-	-	-	-	-	453	483	-	485	499	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.1	15	36
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	388	980	-	-	1089	-	-	215
HCM Lane V/C Ratio	0.069	0.033	-	-	0.005	-	-	0.475
HCM Control Delay (s)	15	8.8	0	-	8.3	0	-	36
HCM Lane LOS	C	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	2.3

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	130	330	350	75	75	195
Future Vol, veh/h	130	330	350	75	75	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	141	359	380	82	82	212

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	462	0	-	0	1062	421
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	641	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1099	-	-	-	247	632
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	525	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1099	-	-	-	215	632
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	458	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	32.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1099	-	-	-	411
HCM Lane V/C Ratio	0.129	-	-	-	0.714
HCM Control Delay (s)	8.8	-	-	-	32.8
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	-	5.5

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	225	180	165	20	20	275
Future Vol, veh/h	225	180	165	20	20	275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	245	196	179	22	22	299

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	201	0	-	0	875	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	685	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1371	-	-	-	320	852
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	500	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1371	-	-	-	263	852
Mov Cap-2 Maneuver	-	-	-	-	263	-
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	411	-

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1371	-	-	-	740
HCM Lane V/C Ratio	0.178	-	-	-	0.433
HCM Control Delay (s)	8.2	-	-	-	13.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.6	-	-	-	2.2

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	245	265	30	35	60
Future Vol, veh/h	30	245	265	30	35	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	255	276	31	36	63

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	307	0	-	0	610	292
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	318	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1254	-	-	-	458	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	738	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1254	-	-	-	445	747
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	717	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1254	-	-	-	598
HCM Lane V/C Ratio	0.025	-	-	-	0.165
HCM Control Delay (s)	7.9	0	-	-	12.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

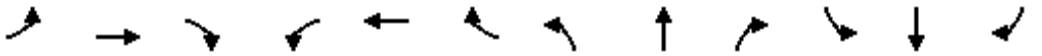
Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	130	80	30	155	40	55	65	20	50	30	65
Future Vol, veh/h	65	130	80	30	155	40	55	65	20	50	30	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	135	-	-	-	-	275	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	92	92	94	94	92	92	92	94	92	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	69	138	87	33	165	43	60	71	22	53	33	69

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	165	0	0	225	0	0	601	550	182	596	594	165
Stage 1	-	-	-	-	-	-	320	320	-	230	230	-
Stage 2	-	-	-	-	-	-	281	230	-	366	364	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1413	-	-	1344	-	-	412	443	861	415	418	879
Stage 1	-	-	-	-	-	-	692	652	-	773	714	-
Stage 2	-	-	-	-	-	-	726	714	-	653	624	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1413	-	-	1344	-	-	335	410	861	331	386	879
Mov Cap-2 Maneuver	-	-	-	-	-	-	335	410	-	331	386	-
Stage 1	-	-	-	-	-	-	658	620	-	735	694	-
Stage 2	-	-	-	-	-	-	620	694	-	536	594	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	1.1	19.1	14
HCM LOS			C	B

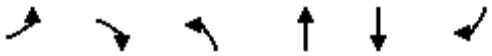
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	405	1413	-	-	1344	-	-	331	624
HCM Lane V/C Ratio	0.376	0.049	-	-	0.024	-	-	0.161	0.163
HCM Control Delay (s)	19.1	7.7	-	-	7.7	0	-	17.9	11.9
HCM Lane LOS	C	A	-	-	A	A	-	C	B
HCM 95th %tile Q(veh)	1.7	0.2	-	-	0.1	-	-	0.6	0.6



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	20	75	5	15	20	85	365	15	15	315	125
Future Volume (vph)	150	20	75	5	15	20	85	365	15	15	315	125
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1607		1593	1678		1593	1850		1593	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1607		1593	1678		1593	1850		1593	1863	1548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	21	79	5	16	21	89	384	16	16	332	132
RTOR Reduction (vph)	0	62	0	0	20	0	0	1	0	0	0	87
Lane Group Flow (vph)	158	38	0	5	17	0	89	399	0	16	332	45
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			4			1			2			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.0	11.3		0.7	3.0		5.3	22.9		0.7	18.3	18.3
Effective Green, g (s)	9.0	11.3		0.7	3.0		5.3	22.9		0.7	18.3	18.3
Actuated g/C Ratio	0.17	0.21		0.01	0.06		0.10	0.43		0.01	0.34	0.34
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	267	338		20	93		157	790		20	636	528
v/s Ratio Prot	c0.10	c0.02		0.00	0.01		c0.06	c0.22		0.01	0.18	
v/s Ratio Perm												0.03
v/c Ratio	0.59	0.11		0.25	0.18		0.57	0.50		0.80	0.52	0.09
Uniform Delay, d1	20.6	17.1		26.2	24.1		23.1	11.2		26.4	14.1	12.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1		6.5	1.0		4.6	0.5		110.1	0.8	0.1
Delay (s)	24.1	17.2		32.7	25.1		27.7	11.7		136.5	14.9	12.0
Level of Service	C	B		C	C		C	B		F	B	B
Approach Delay (s)		21.4			26.0			14.6			18.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	10	10	335	345	5
Future Volume (vph)	10	10	10	335	345	5
Ideal Flow (vphpl)	1710	1900	1710	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	5.3	5.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1593	1583	1593	1863	3531	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1593	1583	1593	1863	3531	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	11	11	360	371	5
RTOR Reduction (vph)	0	11	0	0	1	0
Lane Group Flow (vph)	11	0	11	360	375	0
Confl. Bikes (#/hr)						1
Turn Type	Prot	Perm	Prot	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	0.5	0.5	0.5	9.9	5.9	
Effective Green, g (s)	0.5	0.5	0.5	9.9	5.9	
Actuated g/C Ratio	0.03	0.03	0.03	0.52	0.31	
Clearance Time (s)	3.5	3.5	3.5	5.3	5.3	
Vehicle Extension (s)	2.0	2.0	2.0	4.9	4.9	
Lane Grp Cap (vph)	41	41	41	960	1085	
v/s Ratio Prot	c0.01		0.01	c0.19	0.11	
v/s Ratio Perm		0.00				
v/c Ratio	0.27	0.01	0.27	0.38	0.35	
Uniform Delay, d1	9.2	9.1	9.2	2.8	5.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.0	1.3	0.5	0.4	
Delay (s)	10.5	9.1	10.5	3.3	5.5	
Level of Service	B	A	B	A	A	
Approach Delay (s)	9.8			3.5	5.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	19.2	Sum of lost time (s)	12.3
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	25	315	35	20	340
Future Vol, veh/h	30	25	315	35	20	340
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	27	342	38	22	370

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	774	361	0	0	380	0
Stage 1	361	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	367	684	-	-	1178	-
Stage 1	705	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	358	684	-	-	1178	-
Mov Cap-2 Maneuver	472	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	652	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	549	1178	-
HCM Lane V/C Ratio	-	-	0.109	0.018	-
HCM Control Delay (s)	-	-	12.4	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	45	310	15	40	340
Future Vol, veh/h	15	45	310	15	40	340
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	47	326	16	42	358

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	777	335	0	0	343	0
Stage 1	335	-	-	-	-	-
Stage 2	442	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	365	707	-	-	1216	-
Stage 1	725	-	-	-	-	-
Stage 2	648	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	349	706	-	-	1216	-
Mov Cap-2 Maneuver	462	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	620	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	624	1216	-
HCM Lane V/C Ratio	-	-	0.101	0.035	-
HCM Control Delay (s)	-	-	11.4	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

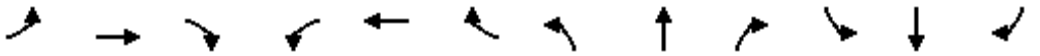
Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	5	30	50	20	45	15	305	40	40	300	10
Future Vol, veh/h	20	5	30	50	20	45	15	305	40	40	300	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	5	32	53	21	48	16	324	43	43	319	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	822	810	324	807	794	347	330	0	0	368	0	0
Stage 1	410	410	-	379	379	-	-	-	-	-	-	-
Stage 2	412	400	-	428	415	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	293	314	717	300	321	696	1229	-	-	1191	-	-
Stage 1	619	595	-	643	615	-	-	-	-	-	-	-
Stage 2	617	602	-	605	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	247	295	717	270	302	695	1229	-	-	1191	-	-
Mov Cap-2 Maneuver	247	295	-	270	302	-	-	-	-	-	-	-
Stage 1	609	569	-	632	605	-	-	-	-	-	-	-
Stage 2	545	592	-	547	566	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	19.8	0.3	0.9
HCM LOS	C	C		

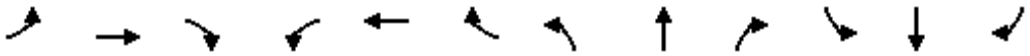
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1229	-	-	394	364	1191	-	-
HCM Lane V/C Ratio	0.013	-	-	0.149	0.336	0.036	-	-
HCM Control Delay (s)	8	0	-	15.7	19.8	8.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.4	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	255	115	160	275	115	95	250	120	135	230	35
Future Volume (vph)	20	255	115	160	275	115	95	250	120	135	230	35
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1546	1593	3539	1557	1593	3352		1593	3462	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1546	1593	3539	1557	1593	3352		1593	3462	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	271	122	170	293	122	101	266	128	144	245	37
RTOR Reduction (vph)	0	0	96	0	0	79	0	56	0	0	11	0
Lane Group Flow (vph)	21	271	26	170	293	43	101	338	0	144	271	0
Confl. Peds. (#/hr)						6			2			5
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.2	15.9	15.9	12.5	26.2	26.2	7.9	16.8		11.4	20.3	
Effective Green, g (s)	2.2	15.9	15.9	12.5	26.2	26.2	7.9	16.8		11.4	20.3	
Actuated g/C Ratio	0.03	0.22	0.22	0.17	0.36	0.36	0.11	0.23		0.15	0.28	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	764	333	270	1259	554	170	765		246	954	
v/s Ratio Prot	0.01	c0.08		c0.11	0.08		0.06	c0.10		c0.09	c0.08	
v/s Ratio Perm			0.02			0.03						
v/c Ratio	0.45	0.35	0.08	0.63	0.23	0.08	0.59	0.44		0.59	0.28	
Uniform Delay, d1	35.1	24.5	23.0	28.4	16.6	15.7	31.3	24.4		28.9	20.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.6	0.2	3.3	0.2	0.1	3.7	0.9		2.3	0.3	
Delay (s)	37.6	25.1	23.2	31.7	16.8	15.8	35.0	25.2		31.2	21.3	
Level of Service	D	C	C	C	B	B	C	C		C	C	
Approach Delay (s)		25.2			20.9			27.2			24.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	73.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	35	15	225	35	60	45	410	210	50	415	75
Future Volume (vph)	40	35	15	225	35	60	45	410	210	50	415	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.91		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1780		1770	1686		1770	3354		1770	3444	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1780		1770	1686		1770	3354		1770	3444	
Peak-hour factor, PHF	0.96	0.92	0.96	0.92	0.92	0.92	0.96	0.96	0.92	0.92	0.96	0.96
Adj. Flow (vph)	42	38	16	245	38	65	47	427	228	54	432	78
RTOR Reduction (vph)	0	15	0	0	48	0	0	65	0	0	13	0
Lane Group Flow (vph)	42	39	0	245	55	0	47	590	0	54	497	0
Confl. Peds. (#/hr)												2
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.9	3.8		15.8	15.7		4.0	18.8		4.1	18.9	
Effective Green, g (s)	3.9	3.8		15.8	15.7		4.0	18.8		4.1	18.9	
Actuated g/C Ratio	0.06	0.06		0.26	0.26		0.07	0.31		0.07	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	114	111		462	437		117	1042		119	1075	
v/s Ratio Prot	0.02	c0.02		c0.14	0.03		0.03	c0.18		c0.03	0.14	
v/s Ratio Perm												
v/c Ratio	0.37	0.35		0.53	0.13		0.40	0.57		0.45	0.46	
Uniform Delay, d1	27.1	27.2		19.2	17.1		27.1	17.4		27.1	16.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.9		1.2	0.1		2.3	0.7		2.7	0.3	
Delay (s)	29.1	29.1		20.3	17.3		29.4	18.2		29.9	17.0	
Level of Service	C	C		C	B		C	B		C	B	
Approach Delay (s)		29.1			19.4			18.9			18.3	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

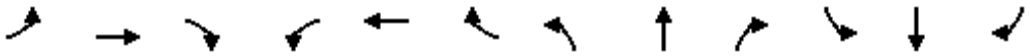
Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	90	440	25	45	450
Future Vol, veh/h	20	90	440	25	45	450
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	97	473	27	48	484

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	826	250	0	0	500	0
Stage 1	487	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	310	750	-	-	1060	-
Stage 1	583	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	291	750	-	-	1060	-
Mov Cap-2 Maneuver	413	-	-	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	650	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	1
HCM LOS	B		

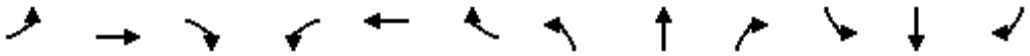
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	653	1060	-
HCM Lane V/C Ratio	-	-	0.181	0.046	-
HCM Control Delay (s)	-	-	11.7	8.6	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	30	30	15	10	45	470	10	10	490	65
Future Volume (vph)	45	0	30	30	15	10	45	470	10	10	490	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1702			1768		1593	3526		1593	3468	
Flt Permitted		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1702			1768		1593	3526		1593	3468	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	48	0	32	32	16	11	48	505	11	11	527	70
RTOR Reduction (vph)	0	68	0	0	10	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	12	0	0	49	0	48	514	0	11	586	0
Confl. Peds. (#/hr)			2						1			
Confl. Bikes (#/hr)									2			1
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8			6.7		2.4	18.7		0.7	17.0	
Effective Green, g (s)		7.8			6.7		2.4	18.7		0.7	17.0	
Actuated g/C Ratio		0.15			0.13		0.05	0.37		0.01	0.34	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		263			235		75	1308		22	1169	
v/s Ratio Prot		c0.01			c0.03		c0.03	0.15		0.01	c0.17	
v/s Ratio Perm												
v/c Ratio		0.05			0.21		0.64	0.39		0.50	0.50	
Uniform Delay, d1		18.1			19.5		23.6	11.7		24.7	13.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.2		13.1	0.4		6.4	0.7	
Delay (s)		18.2			19.7		36.7	12.1		31.0	14.0	
Level of Service		B			B		D	B		C	B	
Approach Delay (s)		18.2			19.7			14.2			14.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

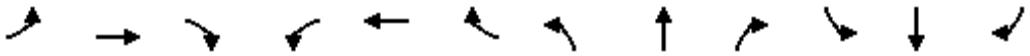
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	20	5	0	0	20	555	10	15	550	20
Future Volume (vph)	25	0	20	5	0	0	20	555	10	15	550	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1692			1770		1593	3528		1593	3517	
Flt Permitted		0.83			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1436			1863		1593	3528		1593	3517	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	27	0	22	5	0	0	22	597	11	16	591	22
RTOR Reduction (vph)	0	44	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	5	0	0	5	0	22	607	0	16	611	0
Confl. Peds. (#/hr)			5			8			7			
Confl. Bikes (#/hr)									1			3
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		5.0			0.7		0.8	29.8		0.7	29.7	
Effective Green, g (s)		5.0			0.7		0.8	29.8		0.7	29.7	
Actuated g/C Ratio		0.09			0.01		0.02	0.57		0.01	0.56	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		136			24		24	1994		21	1982	
v/s Ratio Prot							c0.01	0.17		0.01	c0.17	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.03			0.21		0.92	0.30		0.76	0.31	
Uniform Delay, d1		21.7			25.7		25.9	6.0		25.9	6.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			1.6		143.4	0.3		85.5	0.3	
Delay (s)		21.7			27.3		169.3	6.3		111.4	6.4	
Level of Service		C			C		F	A		F	A	
Approach Delay (s)		21.7			27.3			12.0			9.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	240	90	175	260	335	100	420	130	285	425	170
Future Volume (vph)	110	240	90	175	260	335	100	420	130	285	425	170
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1545	1593	3539	1551	1593	3399		1593	3370	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1545	1593	3539	1551	1593	3399		1593	3370	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	116	253	95	184	274	353	105	442	137	300	447	179
RTOR Reduction (vph)	0	0	79	0	0	265	0	24	0	0	36	0
Lane Group Flow (vph)	116	253	16	184	274	88	105	555	0	300	590	0
Confl. Peds. (#/hr)			4			10			5			4
Confl. Bikes (#/hr)			7						2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.9	16.2	16.2	15.6	23.9	23.9	9.0	24.9		22.6	38.2	
Effective Green, g (s)	7.9	16.2	16.2	15.6	23.9	23.9	9.0	24.9		22.6	38.2	
Actuated g/C Ratio	0.08	0.17	0.17	0.16	0.25	0.25	0.09	0.26		0.24	0.40	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	255	600	262	260	885	388	150	886		376	1348	
v/s Ratio Prot	0.04	c0.07		c0.12	0.08		0.07	c0.16		c0.19	0.18	
v/s Ratio Perm			0.01			0.06						
v/c Ratio	0.45	0.42	0.06	0.71	0.31	0.23	0.70	0.63		0.80	0.44	
Uniform Delay, d1	41.7	35.5	33.3	37.8	29.1	28.5	41.9	31.2		34.3	20.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.0	0.2	7.0	0.4	0.6	10.9	2.0		10.5	0.5	
Delay (s)	42.2	36.5	33.5	44.8	29.5	29.1	52.9	33.1		44.8	21.3	
Level of Service	D	D	C	D	C	C	D	C		D	C	
Approach Delay (s)		37.3			32.8			36.2			28.9	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	93	70	370	98	335	5	65	775	428	269	350
Future Volume (vph)	15	93	70	370	98	335	5	65	775	428	269	350
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.92	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1490	3312	1461	2891	1516	1408		1490	3312	1482	2891	3312
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1490	3312	1461	2891	1516	1408		1490	3312	1482	2891	3312
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	101	76	402	107	364	5	71	842	465	292	380
RTOR Reduction (vph)	0	0	64	0	35	173	0	0	0	149	0	0
Lane Group Flow (vph)	16	101	12	402	210	53	0	76	842	316	292	380
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot	NA
Protected Phases	8	8		7	7		1	1	6	7	5	2
Permitted Phases			8			7				6		
Actuated Green, G (s)	18.3	18.3	18.3	26.5	26.5	26.5		9.6	31.8	58.3	17.1	39.3
Effective Green, g (s)	18.3	18.3	18.3	26.5	26.5	26.5		9.6	31.8	58.3	17.1	39.3
Actuated g/C Ratio	0.16	0.16	0.16	0.23	0.23	0.23		0.08	0.28	0.51	0.15	0.35
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	4.1	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	3.0	5.0
Lane Grp Cap (vph)	239	532	234	673	353	327		125	925	759	434	1143
v/s Ratio Prot	0.01	c0.03		c0.14	0.14			0.05	c0.25	0.10	c0.10	0.11
v/s Ratio Perm			0.01			0.04				0.12		
v/c Ratio	0.07	0.19	0.05	0.60	0.59	0.16		0.61	0.91	0.42	0.67	0.33
Uniform Delay, d1	40.5	41.3	40.4	38.9	38.9	34.8		50.3	39.6	17.2	45.7	27.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	1.4	2.7	0.2		8.1	13.5	0.4	4.1	0.4
Delay (s)	40.6	41.5	40.5	40.3	41.5	35.0		58.4	53.1	17.6	49.8	27.9
Level of Service	D	D	D	D	D	D		E	D	B	D	C
Approach Delay (s)		41.0			39.3				41.4			37.2
Approach LOS		D			D				D			D

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	20.1
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1448
Flt Permitted	1.00
Satd. Flow (perm)	1448
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	11
RTOR Reduction (vph)	7
Lane Group Flow (vph)	4
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	9%
Turn Type	Perm
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	39.3
Effective Green, g (s)	39.3
Actuated g/C Ratio	0.35
Clearance Time (s)	6.5
Vehicle Extension (s)	5.0
Lane Grp Cap (vph)	500
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.01
Uniform Delay, d1	24.5
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	24.5
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	35	90	650	50	273	628	123	110	140	589	88	60
Future Volume (vph)	35	90	650	50	273	628	123	110	140	589	88	60
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900
Total Lost time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1533	3406	1524	1533	3406	1484	1533	1792	1524	1533	1666
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1533	3406	1524	1533	3406	1484	1533	1792	1524	1533	1666
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	98	707	54	297	683	134	120	152	640	96	65
RTOR Reduction (vph)	0	0	0	38	0	0	77	0	0	456	0	21
Lane Group Flow (vph)	0	136	707	16	297	683	57	120	152	184	96	93
Confl. Peds. (#/hr)							3					
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2			6			3		
Actuated Green, G (s)		12.4	31.7	31.7	25.4	44.7	44.7	17.3	17.3	17.3	14.1	14.1
Effective Green, g (s)		12.4	31.7	31.7	25.4	44.7	44.7	17.3	17.3	17.3	14.1	14.1
Actuated g/C Ratio		0.12	0.30	0.30	0.24	0.42	0.42	0.16	0.16	0.16	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0	3.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0	2.0	8.0	8.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		179	1018	455	367	1436	625	250	292	248	203	221
v/s Ratio Prot		0.09	c0.21		c0.19	0.20		0.08	0.08		c0.06	0.06
v/s Ratio Perm				0.01			0.04			c0.12		
v/c Ratio		0.76	0.69	0.04	0.81	0.48	0.09	0.48	0.52	0.74	0.47	0.42
Uniform Delay, d1		45.4	32.9	26.3	38.0	22.2	18.4	40.3	40.6	42.2	42.5	42.2
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		15.1	3.9	0.1	11.7	1.1	0.3	0.5	0.8	10.0	0.6	0.5
Delay (s)		60.4	36.8	26.5	49.7	23.2	18.7	40.8	41.3	52.2	43.1	42.7
Level of Service		E	D	C	D	C	B	D	D	D	D	D
Approach Delay (s)			39.7			29.8			48.9			42.9
Approach LOS			D			C			D			D

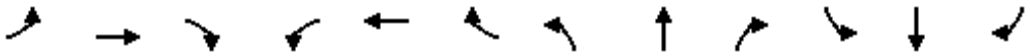
Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	49
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1222	30	45	939	390	10	10	20	286	20	50
Future Volume (vph)	45	1222	30	45	939	390	10	10	20	286	20	50
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.93			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (prot)	1533	3393		1533	3406	1486		1651			1688	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (perm)	1533	3393		1533	3406	1486		1651			1688	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	1328	33	49	1021	424	11	11	22	311	22	54
RTOR Reduction (vph)	0	1	0	0	0	260	0	21	0	0	4	0
Lane Group Flow (vph)	49	1360	0	49	1021	164	0	23	0	0	383	0
Confl. Peds. (#/hr)						3						
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						
Actuated Green, G (s)	4.9	35.0		4.9	34.6	34.6		5.9			25.7	
Effective Green, g (s)	4.9	35.0		4.9	34.6	34.6		5.9			25.7	
Actuated g/C Ratio	0.05	0.39		0.05	0.39	0.39		0.07			0.29	
Clearance Time (s)	3.5	5.3		3.5	5.7	5.7		4.5			4.5	
Vehicle Extension (s)	2.0	7.9		2.0	7.3	7.3		2.0			2.0	
Lane Grp Cap (vph)	84	1329		84	1319	575		109			485	
v/s Ratio Prot	c0.03	c0.40		0.03	0.30			c0.01			c0.23	
v/s Ratio Perm						0.11						
v/c Ratio	0.58	1.02		0.58	0.77	0.29		0.22			0.79	
Uniform Delay, d1	41.2	27.1		41.2	23.9	18.8		39.5			29.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	6.5	30.7		6.5	4.0	1.0		0.4			7.7	
Delay (s)	47.7	57.9		47.7	28.0	19.9		39.9			37.0	
Level of Service	D	E		D	C	B		D			D	
Approach Delay (s)		57.5			26.3			39.9			37.0	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	18.2
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	1473	15	5	10	1329	48	10	0	15	38	0
Future Volume (vph)	20	1473	15	5	10	1329	48	10	0	15	38	0
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00			1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00			1.00
Frt	1.00	1.00			1.00	0.99			0.92			0.95
Flt Protected	0.95	1.00			0.95	1.00			0.98			0.97
Satd. Flow (prot)	1518	3368			1518	3354			1601			1631
Flt Permitted	0.95	1.00			0.95	1.00			0.88			0.80
Satd. Flow (perm)	1518	3368			1518	3354			1436			1344
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1601	16	5	11	1445	52	11	0	16	41	0
RTOR Reduction (vph)	0	0	0	0	0	1	0	0	26	0	0	65
Lane Group Flow (vph)	22	1617	0	0	16	1496	0	0	1	0	0	3
Confl. Peds. (#/hr)			1				1					
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	NA
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	3.0	78.6			2.8	78.4			4.9			4.9
Effective Green, g (s)	3.0	78.6			2.8	78.4			4.9			4.9
Actuated g/C Ratio	0.03	0.79			0.03	0.78			0.05			0.05
Clearance Time (s)	3.5	5.7			3.5	5.7			4.5			4.5
Vehicle Extension (s)	2.0	7.3			2.0	7.3			2.0			2.0
Lane Grp Cap (vph)	45	2647			42	2629			70			65
v/s Ratio Prot	c0.01	c0.48			0.01	0.45						
v/s Ratio Perm									0.00			c0.00
v/c Ratio	0.49	0.61			0.38	0.57			0.02			0.05
Uniform Delay, d1	47.7	4.4			47.7	4.2			45.3			45.3
Progression Factor	1.00	1.00			1.00	1.00			1.00			1.00
Incremental Delay, d2	3.0	1.1			2.1	0.9			0.0			0.1
Delay (s)	50.8	5.5			49.8	5.1			45.3			45.5
Level of Service	D	A			D	A			D			D
Approach Delay (s)		6.1				5.6			45.3			45.5
Approach LOS		A				A			D			D

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	25
Future Volume (vph)	25
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	27
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	7%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	362	1129	20	10	40	1163	505	25	25	25	347	15
Future Volume (vph)	362	1129	20	10	40	1163	505	25	25	25	347	15
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (prot)	1533	3397			1533	3406	1524		1749	1524	1456	1628
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (perm)	1533	3397			1533	3406	1524		1749	1524	1456	1628
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	393	1227	22	11	43	1264	549	27	27	27	377	16
RTOR Reduction (vph)	0	1	0	0	0	0	348	0	0	26	0	0
Lane Group Flow (vph)	393	1248	0	0	54	1264	201	0	54	2	196	197
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	25.3	48.4			5.4	27.5	27.5		5.0	5.0	14.5	14.5
Effective Green, g (s)	25.3	48.4			5.4	27.5	27.5		5.0	5.0	14.5	14.5
Actuated g/C Ratio	0.28	0.54			0.06	0.31	0.31		0.06	0.06	0.16	0.16
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	430	1826			91	1040	465		97	84	234	262
v/s Ratio Prot	c0.26	0.37			0.04	c0.37			c0.03		c0.13	0.12
v/s Ratio Perm							0.13			0.00		
v/c Ratio	0.91	0.68			0.59	1.22	0.43		0.56	0.02	0.84	0.75
Uniform Delay, d1	31.3	15.2			41.2	31.2	25.0		41.4	40.2	36.6	36.0
Progression Factor	1.00	1.00			1.13	0.67	1.02		1.00	1.00	1.00	1.00
Incremental Delay, d2	23.3	2.1			3.0	101.0	1.3		3.9	0.0	21.3	10.3
Delay (s)	54.6	17.3			49.7	122.1	26.9		45.3	40.2	57.9	46.3
Level of Service	D	B			D	F	C		D	D	E	D
Approach Delay (s)		26.2				92.0			43.6			45.2
Approach LOS		C				F			D			D

Intersection Summary			
HCM 2000 Control Delay	58.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	197
Future Volume (vph)	197
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	214
RTOR Reduction (vph)	180
Lane Group Flow (vph)	34
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	14.5
Effective Green, g (s)	14.5
Actuated g/C Ratio	0.16
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	245
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.14
Uniform Delay, d1	32.4
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	32.5
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

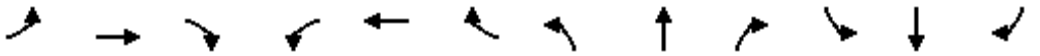
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1512	0	30	1634	186	0	0	30	0	0	74
Future Vol, veh/h	0	1512	0	30	1634	186	0	0	30	0	0	74
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	6	6	6	6	2	6	2	6	2	2	2
Mvmt Flow	0	1643	0	33	1776	202	0	0	33	0	0	80

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1644	0	0	-	-	823	-	-	989
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	5.42	-	-	-	-	7.22	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.16	-	-	-	-	3.96	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	181	-	-	0	0	265	0	0	211
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	181	-	-	-	-	265	-	-	211
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	20.5	32.2
HCM LOS			C	D

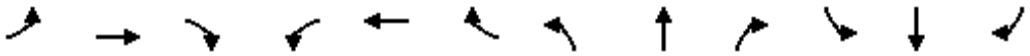
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	265	-	-	181	-	-	211
HCM Lane V/C Ratio	0.123	-	-	0.18	-	-	0.381
HCM Control Delay (s)	20.5	-	-	29.2	-	-	32.2
HCM Lane LOS	C	-	-	D	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	0.6	-	-	1.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1160	387	240	1090	0	0	0	0	235	5	774
Future Volume (vph)	0	1160	387	240	1090	0	0	0	0	235	5	774
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6285	1517	1562	3471						1742	1553
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6285	1517	1562	3471						1742	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1261	421	261	1185	0	0	0	0	255	5	841
RTOR Reduction (vph)	0	0	270	0	0	0	0	0	0	0	0	88
Lane Group Flow (vph)	0	1261	151	261	1185	0	0	0	0	0	260	753
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		32.2	32.2	18.1	54.5						25.8	25.8
Effective Green, g (s)		32.2	32.2	18.1	54.5						25.8	25.8
Actuated g/C Ratio		0.36	0.36	0.20	0.61						0.29	0.29
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2248	542	314	2101						499	445
v/s Ratio Prot		0.20		c0.17	c0.34						0.15	
v/s Ratio Perm			0.10									c0.48
v/c Ratio		0.56	0.28	0.83	0.56						0.52	1.69
Uniform Delay, d1		23.2	20.6	34.5	10.6						26.9	32.1
Progression Factor		0.67	0.69	0.95	0.98						1.00	1.00
Incremental Delay, d2		0.8	1.0	4.7	0.3						0.8	320.6
Delay (s)		16.3	15.3	37.4	10.7						27.7	352.7
Level of Service		B	B	D	B						C	F
Approach Delay (s)		16.0			15.6			0.0			275.9	
Approach LOS		B			B			A			F	

Intersection Summary			
HCM 2000 Control Delay	83.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	601	814	0	0	704	560	611	0	310	0	0	0
Future Volume (vph)	601	814	0	0	704	560	611	0	310	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1752	1568			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	653	885	0	0	765	609	664	0	337	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	312	0	0	119	0	0	0
Lane Group Flow (vph)	653	885	0	0	765	297	0	664	218	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	22.6	54.6			27.8	27.8		25.7	25.7			
Effective Green, g (s)	22.6	54.6			27.8	27.8		25.7	25.7			
Actuated g/C Ratio	0.25	0.61			0.31	0.31		0.29	0.29			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	768	2126			1082	484		500	447			
v/s Ratio Prot	c0.21	0.25			c0.22			c0.38				
v/s Ratio Perm						0.19			0.14			
v/c Ratio	0.85	0.42			0.71	0.61		1.33	0.49			
Uniform Delay, d1	32.1	9.3			27.5	26.5		32.1	26.7			
Progression Factor	0.58	0.24			1.34	2.58		1.00	1.00			
Incremental Delay, d2	7.9	0.5			2.7	4.0		161.0	0.9			
Delay (s)	26.5	2.8			39.4	72.3		193.1	27.6			
Level of Service	C	A			D	E		F	C			
Approach Delay (s)		12.9			54.0			137.4			0.0	
Approach LOS		B			D			F			A	

Intersection Summary			
HCM 2000 Control Delay	59.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



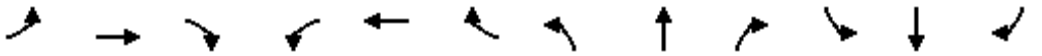
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	490	465	170	65	686	190	160	30	65	155	25
Future Volume (vph)	15	490	465	170	65	686	190	160	30	65	155	25
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3090	3539	1549	1593	3414			1788	1558		1786
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3090	3539	1549	1593	3414			1788	1558		1786
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	516	489	179	68	722	200	168	32	68	163	26
RTOR Reduction (vph)	0	0	0	97	0	22	0	0	0	57	0	0
Lane Group Flow (vph)	0	532	489	82	68	900	0	0	200	11	0	189
Confl. Peds. (#/hr)				1			2			4		
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		17.6	41.2	41.2	5.4	28.1			14.1	14.1		12.1
Effective Green, g (s)		17.6	41.2	41.2	5.4	28.1			14.1	14.1		12.1
Actuated g/C Ratio		0.20	0.46	0.46	0.06	0.31			0.16	0.16		0.13
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		604	1620	709	95	1065			280	244		240
v/s Ratio Prot		c0.17	0.14		0.04	c0.26			c0.11			c0.11
v/s Ratio Perm				0.05						0.01		
v/c Ratio		0.88	0.30	0.12	0.72	0.85			0.71	0.04		0.79
Uniform Delay, d1		35.2	15.4	14.0	41.5	28.9			36.0	32.2		37.7
Progression Factor		0.87	1.18	2.62	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		12.6	0.4	0.3	19.1	8.2			7.0	0.0		14.5
Delay (s)		43.2	18.6	36.9	60.6	37.2			43.0	32.3		52.2
Level of Service		D	B	D	E	D			D	C		D
Approach Delay (s)			32.2			38.8			40.3			40.4
Approach LOS			C			D			D			D

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	413
Future Volume (vph)	413
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1583
Flt Permitted	1.00
Satd. Flow (perm)	1583
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	435
RTOR Reduction (vph)	377
Lane Group Flow (vph)	58
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	12.1
Effective Green, g (s)	12.1
Actuated g/C Ratio	0.13
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	212
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.28
Uniform Delay, d1	35.0
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	35.3
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	618	10	5	821	15	0	0	0	15	0	110
Future Volume (Veh/h)	45	618	10	5	821	15	0	0	0	15	0	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	672	11	5	892	16	0	0	0	16	0	120
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	908			683			1352	1694	678	1686	1691	454
vC1, stage 1 conf vol							776	776		910	910	
vC2, stage 2 conf vol							576	918		776	781	
vCu, unblocked vol	908			564			1330	1722	558	1712	1719	454
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			100	100	100	93	100	78
cM capacity (veh/h)	733			864			233	233	409	215	252	548

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	732	451	462	0	16	120
Volume Left	49	5	0	0	16	0
Volume Right	11	0	16	0	0	120
cSH	733	864	1700	1700	215	548
Volume to Capacity	0.07	0.01	0.27	0.00	0.07	0.22
Queue Length 95th (ft)	5	0	0	0	6	21
Control Delay (s)	1.8	0.2	0.0	0.0	23.1	13.4
Lane LOS	A	A		A	C	B
Approach Delay (s)	1.8	0.1		0.0	14.5	
Approach LOS				A	B	

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	72.3%	ICU Level of Service		C
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	503	155	75	821	30	10
Future Vol, veh/h	503	155	75	821	30	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	547	168	82	892	33	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	715	0	1686	631
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	1055	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	872	-	102	476
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	331	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	872	-	83	476
Mov Cap-2 Maneuver	-	-	-	-	83	-
Stage 1	-	-	-	-	525	-
Stage 2	-	-	-	-	269	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	61.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	105	-	-	872	-
HCM Lane V/C Ratio	0.414	-	-	0.093	-
HCM Control Delay (s)	61.6	-	-	9.6	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	493	10	10	856	10	20	0	10	10	0	20
Future Vol, veh/h	10	493	10	10	856	10	20	0	10	10	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	536	11	11	930	11	22	0	11	11	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	941	0	0	547	0	0	1531	1526	541	1526	1526	936
Stage 1	-	-	-	-	-	-	563	563	-	958	958	-
Stage 2	-	-	-	-	-	-	968	963	-	568	568	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	729	-	-	1022	-	-	96	118	541	96	118	321
Stage 1	-	-	-	-	-	-	511	509	-	309	336	-
Stage 2	-	-	-	-	-	-	305	334	-	508	506	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	729	-	-	1022	-	-	86	113	541	91	113	321
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	113	-	91	113	-
Stage 1	-	-	-	-	-	-	500	498	-	302	328	-
Stage 2	-	-	-	-	-	-	278	326	-	487	495	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	45.8	30.4
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	120	729	-	-	1022	-	-	174
HCM Lane V/C Ratio	0.272	0.015	-	-	0.011	-	-	0.187
HCM Control Delay (s)	45.8	10	0	-	8.6	0	-	30.4
HCM Lane LOS	E	B	A	-	A	A	-	D
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.7

Intersection	
Int Delay, s/veh	18.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	135	378	598	60	45	258
Future Vol, veh/h	135	378	598	60	45	258
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	147	411	650	65	49	280

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	715	0	-	0	1387	683
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	704	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	885	-	-	-	158	449
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	490	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	885	-	-	-	132	449
Mov Cap-2 Maneuver	-	-	-	-	132	-
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	409	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	84.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	885	-	-	-	331
HCM Lane V/C Ratio	0.166	-	-	-	0.995
HCM Control Delay (s)	9.9	-	-	-	84.5
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.6	-	-	-	11

Intersection	
Int Delay, s/veh	23.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	320	103	168	50	50	495
Future Vol, veh/h	320	103	168	50	50	495
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	348	112	183	54	54	538

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	237	0	-	0	1018	210
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	808	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1330	-	-	-	263	830
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	438	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1330	-	-	-	194	830
Mov Cap-2 Maneuver	-	-	-	-	194	-
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	323	-

Approach	EB	WB	SB
HCM Control Delay, s	6.6	0	45.7
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1330	-	-	-	638
HCM Lane V/C Ratio	0.262	-	-	-	0.929
HCM Control Delay (s)	8.7	-	-	-	45.7
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	1.1	-	-	-	12.3

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	285	464	35	45	81
Future Vol, veh/h	45	285	464	35	45	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	310	504	38	49	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	542	0	-	0	931	523
Stage 1	-	-	-	-	523	-
Stage 2	-	-	-	-	408	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1027	-	-	-	296	554
Stage 1	-	-	-	-	595	-
Stage 2	-	-	-	-	671	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1027	-	-	-	279	554
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	595	-
Stage 2	-	-	-	-	632	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1027	-	-	-	410
HCM Lane V/C Ratio	0.048	-	-	-	0.334
HCM Control Delay (s)	8.7	0	-	-	18.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.4

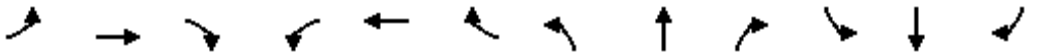
Intersection	
Int Delay, s/veh	41.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	265	55	15	238	30	150	90	65	70	40	116
Future Vol, veh/h	55	265	55	15	238	30	150	90	65	70	40	116
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	135	-	-	-	-	275	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	4	4	2	2	2	4	2	4
Mvmt Flow	60	288	60	16	259	33	163	98	71	76	43	126

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	259	0	0	348	0	0	813	728	318	813	758	259
Stage 1	-	-	-	-	-	-	437	437	-	291	291	-
Stage 2	-	-	-	-	-	-	376	291	-	522	467	-
Critical Hdwy	4.14	-	-	4.12	-	-	7.12	6.52	6.22	7.14	6.52	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.14	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.14	5.52	-
Follow-up Hdwy	2.236	-	-	2.218	-	-	3.518	4.018	3.318	3.536	4.018	3.336
Pot Cap-1 Maneuver	1294	-	-	1211	-	-	297	350	723	295	336	775
Stage 1	-	-	-	-	-	-	598	579	-	713	672	-
Stage 2	-	-	-	-	-	-	645	672	-	534	562	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1294	-	-	1211	-	-	212	328	723	196	315	775
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	328	-	196	315	-
Stage 1	-	-	-	-	-	-	570	552	-	680	661	-
Stage 2	-	-	-	-	-	-	496	661	-	378	536	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0.4	143.6	20.4
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	285	1294	-	-	1211	-	-	196	564
HCM Lane V/C Ratio	1.163	0.046	-	-	0.013	-	-	0.388	0.301
HCM Control Delay (s)	143.6	7.9	-	-	8	0	-	34.6	14.1
HCM Lane LOS	F	A	-	-	A	A	-	D	B
HCM 95th %tile Q(veh)	14.4	0.1	-	-	0	-	-	1.7	1.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	25	135	10	10	10	70	470	20	15	460	158
Future Volume (vph)	265	25	135	10	10	10	70	470	20	15	460	158
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1547	1580		1547	1674		1547	1798		1547	1810	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1547	1580		1547	1674		1547	1798		1547	1810	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	288	27	147	11	11	11	76	511	22	16	500	172
RTOR Reduction (vph)	0	124	0	0	11	0	0	1	0	0	0	97
Lane Group Flow (vph)	288	50	0	11	11	0	76	532	0	16	500	75
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	8.7	9.1		0.8	1.2		5.1	30.0		0.8	25.7	25.7
Effective Green, g (s)	8.7	9.1		0.8	1.2		5.1	30.0		0.8	25.7	25.7
Actuated g/C Ratio	0.15	0.16		0.01	0.02		0.09	0.51		0.01	0.44	0.44
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	229	244		21	34		134	918		21	792	673
v/s Ratio Prot	c0.19	c0.03		0.01	0.01		c0.05	c0.30		0.01	0.28	
v/s Ratio Perm												0.05
v/c Ratio	1.26	0.20		0.52	0.33		0.57	0.58		0.76	0.63	0.11
Uniform Delay, d1	25.0	21.6		28.8	28.4		25.7	10.0		28.9	12.8	9.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	146.3	0.4		21.6	5.6		5.4	0.9		92.1	1.6	0.1
Delay (s)	171.3	22.1		50.3	34.0		31.2	10.9		120.9	14.5	9.8
Level of Service	F	C		D	C		C	B		F	B	A
Approach Delay (s)		115.1			39.4			13.4			15.8	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	0	10	153	0	7	53	240	505	24	50	332
Future Volume (vph)	15	0	10	153	0	7	53	240	505	24	50	332
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1710	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.98
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1681	1681	1583		1593	1863	1583	1770	3470
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1681	1681	1583		1593	1863	1583	1770	3470
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	0	11	166	0	8	58	261	549	26	54	361
RTOR Reduction (vph)	0	0	11	0	0	7	0	0	0	13	0	11
Lane Group Flow (vph)	0	16	0	83	83	1	0	319	549	13	54	404
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		1.8	1.8	7.2	7.2	7.2		18.8	33.8	33.8	4.5	19.5
Effective Green, g (s)		1.8	1.8	7.2	7.2	7.2		18.8	33.8	33.8	4.5	19.5
Actuated g/C Ratio		0.03	0.03	0.11	0.11	0.11		0.28	0.51	0.51	0.07	0.30
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		48	43	183	183	172		453	952	809	120	1023
v/s Ratio Prot		c0.01		c0.05	0.05			c0.20	c0.29		0.03	0.12
v/s Ratio Perm			0.00			0.00				0.01		
v/c Ratio		0.33	0.01	0.45	0.45	0.01		0.70	0.58	0.02	0.45	0.40
Uniform Delay, d1		31.6	31.3	27.6	27.6	26.3		21.2	11.2	8.0	29.6	18.6
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.0	1.8	1.8	0.0		4.0	1.3	0.0	2.7	0.5
Delay (s)		33.1	31.3	29.4	29.4	26.3		25.2	12.5	8.0	32.3	19.1
Level of Service		C	C	C	C	C		C	B	A	C	B
Approach Delay (s)		32.3			29.2				16.9			20.6
Approach LOS		C			C				B			C

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	18.8
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	50
Future Volume (vph)	50
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	54
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	35	481	35	20	379
Future Vol, veh/h	25	35	481	35	20	379
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	27	38	523	38	22	412

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	998	543	0	0	562	0
Stage 1	543	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	269	538	-	-	1004	-
Stage 1	580	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	261	537	-	-	1004	-
Mov Cap-2 Maneuver	392	-	-	-	-	-
Stage 1	579	-	-	-	-	-
Stage 2	619	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	465	1004	-
HCM Lane V/C Ratio	-	-	0.14	0.022	-
HCM Control Delay (s)	-	-	14	8.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	5	53	65	508	28	35	346
Future Vol, veh/h	5	53	65	508	28	35	346
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	0	-	-	0
Grade, %	-	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	2	3	3	3	3	3	3
Mvmt Flow	5	58	71	552	30	38	376

Major/Minor	Minor1			Major1		Major2	
Conflicting Flow All	0	1019	567	0	0	583	0
Stage 1	0	567	-	-	-	-	-
Stage 2	0	452	-	-	-	-	-
Critical Hdwy	-	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	-	5.43	-	-	-	-	-
Critical Hdwy Stg 2	-	5.43	-	-	-	-	-
Follow-up Hdwy	-	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	0	261	521	-	-	986	-
Stage 1	0	566	-	-	-	-	-
Stage 2	0	639	-	-	-	-	-
Platoon blocked, %	-			-	-		-
Mov Cap-1 Maneuver	0	248	521	-	-	986	-
Mov Cap-2 Maneuver	0	380	-	-	-	-	-
Stage 1	0	566	-	-	-	-	-
Stage 2	0	608	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	447	986	-
HCM Lane V/C Ratio	-	-	0.287	0.039	-
HCM Control Delay (s)	-	-	16.3	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

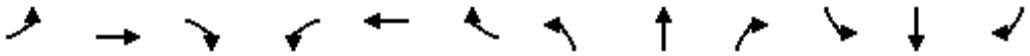
Intersection	
Int Delay, s/veh	22.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	10	10	74	10	135	10	435	108	120	312	10
Future Vol, veh/h	15	10	10	74	10	135	10	435	108	120	312	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	11	11	84	11	153	11	494	123	136	355	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1294	1273	360	1222	1217	556	366	0	0	617	0	0
Stage 1	633	633	-	578	578	-	-	-	-	-	-	-
Stage 2	661	640	-	644	639	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	139	167	684	156	181	531	1193	-	-	963	-	-
Stage 1	468	473	-	501	501	-	-	-	-	-	-	-
Stage 2	452	470	-	461	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	135	684	123	147	531	1193	-	-	963	-	-
Mov Cap-2 Maneuver	80	135	-	123	147	-	-	-	-	-	-	-
Stage 1	461	389	-	494	494	-	-	-	-	-	-	-
Stage 2	310	463	-	362	386	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.8	116.9	0.1	2.5
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1193	-	-	127	237	963	-	-
HCM Lane V/C Ratio	0.01	-	-	0.313	1.05	0.142	-	-
HCM Control Delay (s)	8	0	-	45.8	116.9	9.4	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	10.4	0.5	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	240	126	210	430	180	285	285	185	145	250	80
Future Volume (vph)	25	240	126	210	430	180	285	285	185	145	250	80
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1540	1593	3539	1549	1593	3307		1593	3394	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1540	1593	3539	1549	1593	3307		1593	3394	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	261	137	228	467	196	310	310	201	158	272	87
RTOR Reduction (vph)	0	0	111	0	0	119	0	99	0	0	31	0
Lane Group Flow (vph)	27	261	26	228	467	77	310	412	0	158	328	0
Confl. Peds. (#/hr)			1			9			4			6
Confl. Bikes (#/hr)			3			3			2			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.8	17.8	17.8	22.0	37.0	37.0	20.4	24.2		13.3	17.1	
Effective Green, g (s)	2.8	17.8	17.8	22.0	37.0	37.0	20.4	24.2		13.3	17.1	
Actuated g/C Ratio	0.03	0.19	0.19	0.23	0.39	0.39	0.22	0.26		0.14	0.18	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	668	290	371	1388	607	344	848		224	615	
v/s Ratio Prot	0.02	c0.07		c0.14	0.13		c0.19	c0.12		0.10	0.10	
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.57	0.39	0.09	0.61	0.34	0.13	0.90	0.49		0.71	0.53	
Uniform Delay, d1	45.2	33.5	31.6	32.4	20.1	18.3	36.0	29.8		38.6	35.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.1	0.8	0.3	7.4	0.3	0.2	25.0	0.9		8.0	1.6	
Delay (s)	55.3	34.3	31.8	39.8	20.4	18.5	61.0	30.7		46.6	36.6	
Level of Service	E	C	C	D	C	B	E	C		D	D	
Approach Delay (s)		34.8			24.9			42.1			39.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	94.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	50	10	10	105	10	25	5	100	556	80	25	473
Future Volume (vph)	50	10	10	105	10	25	5	100	556	80	25	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.93		1.00	0.89			1.00	0.98		1.00	0.98
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	1723		1770	1664			1770	3472		1770	3476
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	1723		1770	1664			1770	3472		1770	3476
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	11	114	11	27	5	109	604	87	27	514
RTOR Reduction (vph)	0	10	0	0	23	0	0	0	9	0	0	8
Lane Group Flow (vph)	54	12	0	114	15	0	0	114	682	0	27	566
Confl. Peds. (#/hr)												
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	7.0	8.3		7.8	9.1			9.8	26.7		2.5	19.4
Effective Green, g (s)	7.0	8.3		7.8	9.1			9.8	26.7		2.5	19.4
Actuated g/C Ratio	0.11	0.13		0.12	0.14			0.15	0.42		0.04	0.31
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	195	225		218	239			274	1464		69	1065
v/s Ratio Prot	0.03	0.01		c0.06	c0.01			c0.06	c0.20		0.02	c0.16
v/s Ratio Perm												
v/c Ratio	0.28	0.06		0.52	0.06			0.42	0.47		0.39	0.53
Uniform Delay, d1	25.8	24.1		26.0	23.4			24.2	13.2		29.7	18.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.1		2.3	0.1			1.0	0.2		3.6	0.5
Delay (s)	26.6	24.2		28.3	23.5			25.2	13.4		33.3	18.7
Level of Service	C	C		C	C			C	B		C	B
Approach Delay (s)		25.9			27.1				15.1			19.4
Approach LOS		C			C				B			B

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	55
Future Volume (vph)	55
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	60
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

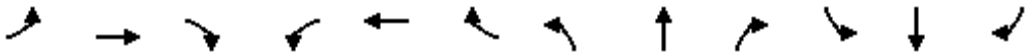
Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	145	576	15	35	443
Future Vol, veh/h	30	145	576	15	35	443
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	33	158	626	16	38	482

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	951	321	0	0	642	0
Stage 1	634	-	-	-	-	-
Stage 2	317	-	-	-	-	-
Critical Hdwy	6.88	6.98	-	-	4.18	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.34	-	-	2.24	-
Pot Cap-1 Maneuver	254	669	-	-	925	-
Stage 1	485	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	240	669	-	-	925	-
Mov Cap-2 Maneuver	361	-	-	-	-	-
Stage 1	485	-	-	-	-	-
Stage 2	666	-	-	-	-	-

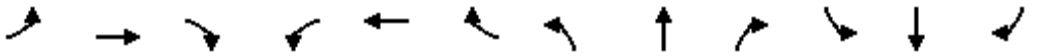
Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	584	925	-
HCM Lane V/C Ratio	-	-	0.326	0.041	-
HCM Control Delay (s)	-	-	14.1	9.1	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.4	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	13	80	20	28	25	120	616	25	20	368	163
Future Volume (vph)	182	13	80	20	28	25	120	616	25	20	368	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.95		1.00	0.99		1.00	0.95	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1724			1752		1593	3516		1593	3345	
Flt Permitted		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1724			1752		1593	3516		1593	3345	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	198	14	87	22	30	27	130	670	27	22	400	177
RTOR Reduction (vph)	0	15	0	0	23	0	0	3	0	0	54	0
Lane Group Flow (vph)	0	284	0	0	56	0	130	694	0	22	523	0
Confl. Peds. (#/hr)			7						1			8
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		17.8			5.6		8.2	26.6		2.2	20.6	
Effective Green, g (s)		17.8			5.6		8.2	26.6		2.2	20.6	
Actuated g/C Ratio		0.26			0.08		0.12	0.39		0.03	0.30	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		446			142		190	1361		51	1003	
v/s Ratio Prot		c0.16			c0.03		c0.08	c0.20		0.01	0.16	
v/s Ratio Perm												
v/c Ratio		0.64			0.39		0.68	0.51		0.43	0.52	
Uniform Delay, d1		22.6			29.9		29.0	16.1		32.6	20.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.2			0.7		7.9	0.6		2.1	0.9	
Delay (s)		24.8			30.6		36.9	16.7		34.8	20.9	
Level of Service		C			C		D	B		C	C	
Approach Delay (s)		24.8			30.6			19.9			21.4	
Approach LOS		C			C			B			C	

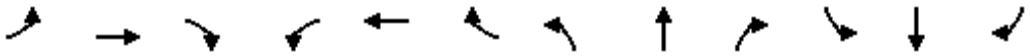
Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	65	60	45	0	10	40	791	60	190	683	60
Future Volume (vph)	75	65	60	45	0	10	40	791	60	190	683	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.92		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1755			1602		1593	3493		1593	3485	
Flt Permitted		0.86			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1538			1346		1593	3493		1593	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	71	65	49	0	11	43	860	65	207	742	65
RTOR Reduction (vph)	0	10	0	0	57	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	208	0	0	3	0	43	921	0	207	801	0
Confl. Peds. (#/hr)						149			6			10
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		27.3			4.5		20.7	36.9		18.0	34.2	
Effective Green, g (s)		27.3			4.5		20.7	36.9		18.0	34.2	
Actuated g/C Ratio		0.26			0.04		0.20	0.36		0.17	0.33	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		406			58		319	1248		277	1154	
v/s Ratio Prot							0.03	c0.26		c0.13	0.23	
v/s Ratio Perm		c0.14			c0.00							
v/c Ratio		0.51			0.05		0.13	0.74		0.75	0.69	
Uniform Delay, d1		32.3			47.3		33.9	28.9		40.4	30.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5			0.1		0.9	3.4		9.2	2.9	
Delay (s)		32.7			47.4		34.8	32.3		49.7	32.9	
Level of Service		C			D		C	C		D	C	
Approach Delay (s)		32.7			47.4			32.4			36.3	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	103.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	280	160	264	510	230	280	708	208	130	484	110
Future Volume (vph)	140	280	160	264	510	230	280	708	208	130	484	110
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1525	1593	3539	1529	1593	3392		1593	3426	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1525	1593	3539	1529	1593	3392		1593	3426	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	304	174	287	554	250	304	770	226	141	526	120
RTOR Reduction (vph)	0	0	117	0	0	125	0	18	0	0	15	0
Lane Group Flow (vph)	152	304	57	287	554	125	304	978	0	141	631	0
Confl. Peds. (#/hr)			24			21			19			8
Confl. Bikes (#/hr)			1			2			2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	10.3	24.4	24.4	24.7	38.8	38.8	17.1	31.8		14.7	29.1	
Effective Green, g (s)	10.3	24.4	24.4	24.7	38.8	38.8	17.1	31.8		14.7	29.1	
Actuated g/C Ratio	0.09	0.22	0.22	0.22	0.35	0.35	0.15	0.28		0.13	0.26	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	284	772	332	351	1228	530	243	964		209	891	
v/s Ratio Prot	0.05	0.09		c0.18	c0.16		c0.19	c0.29		0.09	0.18	
v/s Ratio Perm			0.04			0.08						
v/c Ratio	0.54	0.39	0.17	0.82	0.45	0.24	1.25	1.01		0.67	0.71	
Uniform Delay, d1	48.5	37.4	35.5	41.4	28.3	26.0	47.3	40.0		46.3	37.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.7	0.5	13.1	0.6	0.5	142.3	32.7		6.6	3.3	
Delay (s)	49.4	38.1	36.0	54.5	28.8	26.4	189.6	72.7		52.9	40.8	
Level of Service	D	D	D	D	C	C	F	E		D	D	
Approach Delay (s)		40.2			35.0			100.0			42.9	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	59.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	111.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	3	528	13	3	402
Future Vol, veh/h	30	3	528	13	3	402
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	3	574	14	3	437

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1024	581	0	0	588	0
Stage 1	581	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	261	514	-	-	987	-
Stage 1	559	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	260	514	-	-	987	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	272	987	-
HCM Lane V/C Ratio	-	-	0.132	0.003	-
HCM Control Delay (s)	-	-	20.2	8.7	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	6.2

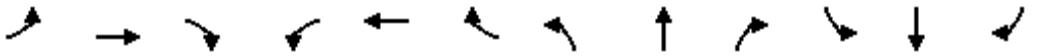
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	210	51	703	157	0	366
Future Vol, veh/h	210	51	703	157	0	366
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	55	764	171	0	398

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1049	468	0	0	-	-
Stage 1	850	-	-	-	-	-
Stage 2	199	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	~ 223	542	-	-	0	-
Stage 1	379	-	-	-	0	-
Stage 2	815	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 223	542	-	-	-	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	379	-	-	-	-	-
Stage 2	815	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	35.5	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBT
Capacity (veh/h)	-	-	316	542	-
HCM Lane V/C Ratio	-	-	0.722	0.102	-
HCM Control Delay (s)	-	-	41.1	12.4	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	5.3	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	98	80	578	88	249	50	550	427	378	800	20
Future Volume (vph)	20	98	80	578	88	249	50	550	427	378	800	20
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1562	3471	1533	3030	1596	1456	1562	3471	1544	3030	3471	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1562	3471	1533	3030	1596	1456	1562	3471	1544	3030	3471	1520
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	102	83	602	92	259	52	573	445	394	833	21
RTOR Reduction (vph)	0	0	70	0	0	0	0	0	130	0	0	14
Lane Group Flow (vph)	21	102	13	602	183	168	52	573	315	394	833	7
Confl. Peds. (#/hr)			1									1
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	8	8		7	7		1	6	7	5	2	
Permitted Phases			8			7			6			2
Actuated Green, G (s)	18.4	18.4	18.4	30.8	30.8	30.8	8.9	26.7	57.5	20.6	38.4	38.4
Effective Green, g (s)	18.4	18.4	18.4	30.8	30.8	30.8	8.9	26.7	57.5	20.6	38.4	38.4
Actuated g/C Ratio	0.16	0.16	0.16	0.26	0.26	0.26	0.08	0.23	0.49	0.18	0.33	0.33
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.1	6.5	4.9	4.1	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	246	547	241	800	421	384	119	794	761	535	1143	500
v/s Ratio Prot	0.01	c0.03		c0.20	0.11		0.03	0.17	0.11	c0.13	c0.24	
v/s Ratio Perm			0.01			0.12			0.09			0.00
v/c Ratio	0.09	0.19	0.05	0.75	0.43	0.44	0.44	0.72	0.41	0.74	0.73	0.01
Uniform Delay, d1	41.9	42.6	41.7	39.4	35.7	35.7	51.5	41.5	18.8	45.4	34.5	26.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	0.1	4.0	0.7	0.8	2.6	4.0	0.4	5.2	2.9	0.0
Delay (s)	42.1	42.8	41.8	43.4	36.4	36.5	54.0	45.5	19.2	50.7	37.4	26.4
Level of Service	D	D	D	D	D	D	D	D	B	D	D	C
Approach Delay (s)		42.3			40.9			35.0			41.4	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	116.6	Sum of lost time (s)	20.1
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	20	55	678	100	5	544	725	53	80	60	444	103
Future Volume (vph)	20	55	678	100	5	544	725	53	80	60	444	103
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1900	1900	1710
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)		1562	3471	1553		1562	3471	1521	1562	1827	1553	1562
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	60	737	109	5	591	788	58	87	65	483	112
RTOR Reduction (vph)	0	0	0	72	0	0	0	27	0	0	431	0
Lane Group Flow (vph)	0	82	737	37	0	596	788	31	87	65	52	112
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2				6			3	
Actuated Green, G (s)		9.6	31.8	31.8		37.0	59.2	59.2	11.9	11.9	11.9	12.5
Effective Green, g (s)		9.6	31.8	31.8		37.0	59.2	59.2	11.9	11.9	11.9	12.5
Actuated g/C Ratio		0.09	0.29	0.29		0.33	0.53	0.53	0.11	0.11	0.11	0.11
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)		135	997	446		522	1856	813	167	196	166	176
v/s Ratio Prot		0.05	c0.21			c0.38	0.23		c0.06	0.04		c0.07
v/s Ratio Perm				0.02				0.02			0.03	
v/c Ratio		0.61	0.74	0.08		1.14	0.42	0.04	0.52	0.33	0.31	0.64
Uniform Delay, d1		48.7	35.7	28.8		36.9	15.5	12.2	46.7	45.7	45.6	46.9
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.2	4.9	0.3		84.7	0.7	0.1	1.4	0.4	0.4	5.4
Delay (s)		53.9	40.6	29.1		121.6	16.2	12.3	48.1	46.1	46.0	52.4
Level of Service		D	D	C		F	B	B	D	D	D	D
Approach Delay (s)			40.4				59.6			46.3		
Approach LOS			D				E			D		

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.7	Sum of lost time (s)	17.5
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	75	50
Future Volume (vph)	75	50
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.94	
Flt Protected	1.00	
Satd. Flow (prot)	1718	
Flt Permitted	1.00	
Satd. Flow (perm)	1718	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	82	54
RTOR Reduction (vph)	19	0
Lane Group Flow (vph)	117	0
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	12.5	
Effective Green, g (s)	12.5	
Actuated g/C Ratio	0.11	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	193	
v/s Ratio Prot	0.07	
v/s Ratio Perm		
v/c Ratio	0.61	
Uniform Delay, d1	46.8	
Progression Factor	1.00	
Incremental Delay, d2	3.7	
Delay (s)	50.5	
Level of Service	D	
Approach Delay (s)	51.3	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	50	1105	10	5	10	1202	241	15	20	15	386
Future Volume (vph)	5	50	1105	10	5	10	1202	241	15	20	15	386
Ideal Flow (vphpl)	1900	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		0.96		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (prot)		1577	3500			1577	3505	1532		1738		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.99		
Satd. Flow (perm)		1577	3500			1577	3505	1532		1738		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	54	1201	11	5	11	1307	262	16	22	16	420
RTOR Reduction (vph)	0	0	1	0	0	0	0	163	0	14	0	0
Lane Group Flow (vph)	0	59	1211	0	0	16	1307	99	0	40	0	0
Confl. Peds. (#/hr)								1			1	
Confl. Bikes (#/hr)								1				
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		6.5	41.6			2.4	37.1	37.1		9.8		
Effective Green, g (s)		6.5	41.6			2.4	37.1	37.1		9.8		
Actuated g/C Ratio		0.07	0.42			0.02	0.38	0.38		0.10		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		104	1484			38	1325	579		173		
v/s Ratio Prot		c0.04	0.35			0.01	c0.37			c0.02		
v/s Ratio Perm								0.06				
v/c Ratio		0.57	0.82			0.42	0.99	0.17		0.23		
Uniform Delay, d1		44.4	24.9			47.2	30.3	20.3		40.7		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		4.2	4.6			2.7	21.7	0.5		0.3		
Delay (s)		48.6	29.5			49.9	51.9	20.8		40.9		
Level of Service		D	C			D	D	C		D		
Approach Delay (s)			30.4				46.8			40.9		
Approach LOS			C				D			D		

Intersection Summary			
HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	98.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	45
Future Volume (vph)	10	45
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	0.96	
Satd. Flow (prot)	1731	
Flt Permitted	0.96	
Satd. Flow (perm)	1731	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	11	49
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	477	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	33%	3%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	26.5	
Effective Green, g (s)	26.5	
Actuated g/C Ratio	0.27	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	467	
v/s Ratio Prot	c0.28	
v/s Ratio Perm		
v/c Ratio	1.02	
Uniform Delay, d1	35.8	
Progression Factor	1.00	
Incremental Delay, d2	47.2	
Delay (s)	83.0	
Level of Service	F	
Approach Delay (s)	83.0	
Approach LOS	F	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	30	1481	10	5	30	1448	68	15	0	20	43
Future Volume (vph)	5	30	1481	10	5	30	1448	68	15	0	20	43
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1547	3434			1547	3411			1619		
Flt Permitted		0.95	1.00			0.95	1.00			0.88		
Satd. Flow (perm)		1547	3434			1547	3411			1454		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	31	1527	10	5	31	1493	70	15	0	21	44
RTOR Reduction (vph)	0	0	0	0	0	0	2	0	0	34	0	0
Lane Group Flow (vph)	0	36	1537	0	0	36	1561	0	0	2	0	0
Confl. Peds. (#/hr)				1				4			4	
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		4.7	65.5			4.7	65.5			6.1		
Effective Green, g (s)		4.7	65.5			4.7	65.5			6.1		
Actuated g/C Ratio		0.05	0.73			0.05	0.73			0.07		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		80	2499			80	2482			98		
v/s Ratio Prot		c0.02	0.45			0.02	c0.46					
v/s Ratio Perm										0.00		
v/c Ratio		0.45	0.61			0.45	0.63			0.02		
Uniform Delay, d1		41.4	6.0			41.4	6.1			39.2		
Progression Factor		1.00	1.00			1.16	1.50			1.00		
Incremental Delay, d2		1.5	1.1			0.5	0.4			0.0		
Delay (s)		42.9	7.2			48.4	9.6			39.2		
Level of Service		D	A			D	A			D		
Approach Delay (s)			8.0				10.5			39.2		
Approach LOS			A				B			D		

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	25
Future Volume (vph)	0	25
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1658	
Flt Permitted	0.79	
Satd. Flow (perm)	1347	
Peak-hour factor, PHF	0.97	0.97
Adj. Flow (vph)	0	26
RTOR Reduction (vph)	65	0
Lane Group Flow (vph)	5	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	5%	5%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	6.1	
Effective Green, g (s)	6.1	
Actuated g/C Ratio	0.07	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	91	
v/s Ratio Prot		
v/s Ratio Perm	c0.00	
v/c Ratio	0.05	
Uniform Delay, d1	39.2	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	39.3	
Level of Service	D	
Approach Delay (s)	39.3	
Approach LOS	D	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	258	1232	25	21	30	1158	431	30	25	40	901	15
Future Volume (vph)	258	1232	25	21	30	1158	431	30	25	40	901	15
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (prot)	1577	3493			1752	3505	1568		1796	1568	1498	1672
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (perm)	1577	3493			1752	3505	1568		1796	1568	1498	1672
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	266	1270	26	22	31	1194	444	31	26	41	929	15
RTOR Reduction (vph)	0	1	0	0	0	0	290	0	0	39	0	0
Lane Group Flow (vph)	266	1295	0	0	53	1194	154	0	57	2	474	470
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	18.4	43.6			4.9	29.1	29.1		5.0	5.0	19.8	19.8
Effective Green, g (s)	18.4	43.6			4.9	29.1	29.1		5.0	5.0	19.8	19.8
Actuated g/C Ratio	0.20	0.48			0.05	0.32	0.32		0.06	0.06	0.22	0.22
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	322	1692			95	1133	506		99	87	329	367
v/s Ratio Prot	c0.17	0.37			0.03	c0.34			c0.03		c0.32	0.28
v/s Ratio Perm							0.10			0.00		
v/c Ratio	0.83	0.77			0.56	1.05	0.30		0.58	0.03	1.44	1.28
Uniform Delay, d1	34.3	19.0			41.5	30.4	22.8		41.5	40.2	35.1	35.1
Progression Factor	1.16	0.73			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	12.8	2.8			4.0	42.1	1.5		5.0	0.0	214.8	145.7
Delay (s)	52.5	16.7			45.5	72.6	24.4		46.4	40.2	249.9	180.8
Level of Service	D	B			D	E	C		D	D	F	F
Approach Delay (s)		22.8				59.1			43.8			165.6
Approach LOS		C				E			D			F

Intersection Summary			
HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	345
Future Volume (vph)	345
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	356
RTOR Reduction (vph)	152
Lane Group Flow (vph)	204
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	19.8
Effective Green, g (s)	19.8
Actuated g/C Ratio	0.22
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	344
v/s Ratio Prot	
v/s Ratio Perm	0.13
v/c Ratio	0.59
Uniform Delay, d1	31.5
Progression Factor	1.00
Incremental Delay, d2	1.8
Delay (s)	33.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

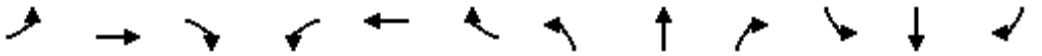
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	2212	20	5	1527	238	0	0	30	0	0	65
Future Vol, veh/h	0	2212	20	5	1527	238	0	0	30	0	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2404	22	5	1660	259	0	0	33	0	0	71

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	2426	0	0	-	-	1213	-	-	959
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	5.34	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	3.12	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	76	-	-	0	0	149	0	0	221
Stage 1	0	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	76	-	-	-	-	149	-	-	221
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	35.8	28.8
HCM LOS			E	D

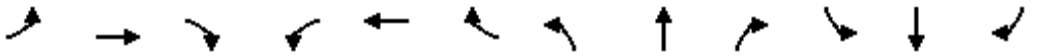
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	149	-	-	76	-	-	221
HCM Lane V/C Ratio	0.219	-	-	0.072	-	-	0.32
HCM Control Delay (s)	35.8	-	-	56	-	-	28.8
HCM Lane LOS	E	-	-	F	-	-	D
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-	-	1.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1459	710	340	1018	0	0	0	0	285	0	707
Future Volume (vph)	0	1459	710	340	1018	0	0	0	0	285	0	707
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6346	1532	1577	3505						1752	1568
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6346	1532	1577	3505						1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1552	755	362	1083	0	0	0	0	303	0	752
RTOR Reduction (vph)	0	0	317	0	0	0	0	0	0	0	0	124
Lane Group Flow (vph)	0	1552	438	362	1083	0	0	0	0	0	303	628
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		35.8	35.8	20.9	60.9						15.5	15.5
Effective Green, g (s)		35.8	35.8	20.9	60.9						15.5	15.5
Actuated g/C Ratio		0.42	0.42	0.24	0.71						0.18	0.18
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2638	636	382	2479						315	282
v/s Ratio Prot		0.24		c0.23	0.31						0.17	
v/s Ratio Perm			c0.29									c0.40
v/c Ratio		0.59	0.69	0.95	0.44						0.96	2.23
Uniform Delay, d1		19.5	20.6	32.1	5.3						35.0	35.3
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	3.4	32.2	0.2						40.3	563.8
Delay (s)		19.9	24.0	64.2	5.5						75.3	599.1
Level of Service		B	C	E	A						E	F
Approach Delay (s)		21.2			20.2			0.0			448.6	
Approach LOS		C			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	114.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	13.9
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	755	974	0	0	912	380	456	5	295	0	0	0
Future Volume (vph)	755	974	0	0	912	380	456	5	295	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568		1758	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568		1758	1568			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	795	1025	0	0	960	400	480	5	311	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	168	0	0	89	0	0	0
Lane Group Flow (vph)	795	1025	0	0	960	232	0	485	222	0	0	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	25.4	55.9			26.3	26.3		24.4	24.4			
Effective Green, g (s)	25.4	55.9			26.3	26.3		24.4	24.4			
Actuated g/C Ratio	0.28	0.62			0.29	0.29		0.27	0.27			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	863	2176			1024	458		476	425			
v/s Ratio Prot	c0.26	0.29			c0.27			c0.28				
v/s Ratio Perm						0.15			0.14			
v/c Ratio	0.92	0.47			0.94	0.51		1.02	0.52			
Uniform Delay, d1	31.3	9.1			31.0	26.5		32.8	27.9			
Progression Factor	1.00	1.00			1.25	1.74		1.00	1.00			
Incremental Delay, d2	14.7	0.7			12.2	2.7		46.1	1.2			
Delay (s)	46.1	9.9			51.0	48.7		78.9	29.1			
Level of Service	D	A			D	D		E	C			
Approach Delay (s)		25.7			50.3			59.4			0.0	
Approach LOS		C			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	483	716	80	35	619	185	125	10	25	195	15
Future Volume (vph)	15	483	716	80	35	619	185	125	10	25	195	15
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Lane Util. Factor		0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00
Frt		1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (prot)		3060	3505	1568	1577	3372			1763	1534		1763
Flt Permitted		0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96
Satd. Flow (perm)		3060	3505	1568	1577	3372			1763	1534		1763
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	514	762	85	37	659	197	133	11	27	207	16
RTOR Reduction (vph)	0	0	0	44	0	24	0	0	0	23	0	0
Lane Group Flow (vph)	0	530	762	41	37	832	0	0	144	4	0	223
Confl. Peds. (#/hr)							3			9		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2						3		
Actuated Green, G (s)		17.7	43.7	43.7	3.4	28.5			12.1	12.1		13.6
Effective Green, g (s)		17.7	43.7	43.7	3.4	28.5			12.1	12.1		13.6
Actuated g/C Ratio		0.20	0.49	0.49	0.04	0.32			0.13	0.13		0.15
Clearance Time (s)		4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4
Vehicle Extension (s)		0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2
Lane Grp Cap (vph)		601	1701	761	59	1067			237	206		266
v/s Ratio Prot		c0.17	0.22		0.02	c0.25			c0.08			c0.13
v/s Ratio Perm				0.03						0.00		
v/c Ratio		0.88	0.45	0.05	0.63	0.78			0.61	0.02		0.84
Uniform Delay, d1		35.1	15.2	12.2	42.7	27.9			36.7	33.8		37.1
Progression Factor		0.90	1.10	2.25	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2		12.6	0.8	0.1	14.0	5.7			3.0	0.0		19.3
Delay (s)		44.2	17.6	27.6	56.7	33.6			39.7	33.8		56.4
Level of Service		D	B	C	E	C			D	C		E
Approach Delay (s)			28.4			34.5			38.8			40.7
Approach LOS			C			C			D			D

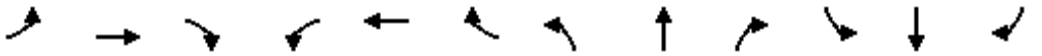
Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	558
Future Volume (vph)	558
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	594
RTOR Reduction (vph)	504
Lane Group Flow (vph)	90
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	13.6
Effective Green, g (s)	13.6
Actuated g/C Ratio	0.15
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	236
v/s Ratio Prot	
v/s Ratio Perm	0.06
v/c Ratio	0.38
Uniform Delay, d1	34.4
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	34.8
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	846	5	5	744	25	10	5	5	20	0	80
Future Volume (Veh/h)	80	846	5	5	744	25	10	5	5	20	0	80
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	84	891	5	5	783	26	11	5	5	21	0	84
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.80			0.80	0.80	0.80	0.80	0.80	
vC, conflicting volume	809			896			1547	1880	894	1876	1870	404
vC1, stage 1 conf vol							1062	1062		806	806	
vC2, stage 2 conf vol							486	819		1070	1064	
vCu, unblocked vol	809			744			1559	1976	742	1970	1963	404
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)							6.6	5.6		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			99			94	97	98	87	100	86
cM capacity (veh/h)	806			681			174	186	284	156	198	593

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	980	396	418	21	21	84
Volume Left	84	5	0	11	21	0
Volume Right	5	0	26	5	0	84
cSH	806	681	1700	195	156	593
Volume to Capacity	0.10	0.01	0.25	0.11	0.13	0.14
Queue Length 95th (ft)	9	1	0	9	11	12
Control Delay (s)	2.9	0.2	0.0	25.7	31.6	12.1
Lane LOS	A	A		D	D	B
Approach Delay (s)	2.9	0.1		25.7	16.0	
Approach LOS				D	C	

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	88.8%	ICU Level of Service		E
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	756	65	10	684	90	15
Future Vol, veh/h	756	65	10	684	90	15
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	796	68	11	720	95	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	865	0	1572	831
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	741	-
Critical Hdwy	-	-	4.14	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.236	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	770	-	120	366
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	770	-	117	366
Mov Cap-2 Maneuver	-	-	-	-	117	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	457	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	107.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	130	-	-	770	-
HCM Lane V/C Ratio	0.85	-	-	0.014	-
HCM Control Delay (s)	107.3	-	-	9.7	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	5.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	751	15	10	684	10	10	0	10	10	0	10
Future Vol, veh/h	20	751	15	10	684	10	10	0	10	10	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	791	16	11	720	11	11	0	11	11	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	731	0	0	806	0	0	1593	1593	798	1592	1594	725
Stage 1	-	-	-	-	-	-	841	841	-	746	746	-
Stage 2	-	-	-	-	-	-	752	752	-	846	848	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	873	-	-	819	-	-	86	107	386	87	107	425
Stage 1	-	-	-	-	-	-	359	380	-	405	421	-
Stage 2	-	-	-	-	-	-	402	418	-	357	378	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	873	-	-	819	-	-	80	100	386	80	100	425
Mov Cap-2 Maneuver	-	-	-	-	-	-	80	100	-	80	100	-
Stage 1	-	-	-	-	-	-	343	363	-	387	411	-
Stage 2	-	-	-	-	-	-	383	408	-	332	361	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	37.1	36.5
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	133	873	-	-	819	-	-	135
HCM Lane V/C Ratio	0.158	0.024	-	-	0.013	-	-	0.156
HCM Control Delay (s)	37.1	9.2	0	-	9.5	0	-	36.5
HCM Lane LOS	E	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	87.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	213	558	482	90	105	222
Future Vol, veh/h	213	558	482	90	105	222
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	232	607	524	98	114	241

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	622	0	-	0	1643	573
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	1070	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	959	-	-	-	~ 110	519
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	329	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	959	-	-	-	~ 83	519
Mov Cap-2 Maneuver	-	-	-	-	~ 83	-
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	249	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	$ 439.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	959	-	-	-	193
HCM Lane V/C Ratio	0.241	-	-	-	1.842
HCM Control Delay (s)	9.9	-	-	-	$ 439.6
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	25.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	26.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	470	213	173	50	40	379
Future Vol, veh/h	470	213	173	50	40	379
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	511	232	188	54	43	412

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	242	0	-	0	1468	215
Stage 1	-	-	-	-	215	-
Stage 2	-	-	-	-	1253	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1324	-	-	-	141	825
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	269	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1324	-	-	-	87	825
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	165	-

Approach	EB	WB	SB
HCM Control Delay, s	6.5	0	72.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1324	-	-	-	456
HCM Lane V/C Ratio	0.386	-	-	-	0.999
HCM Control Delay (s)	9.4	-	-	-	72.2
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	1.9	-	-	-	13

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	429	383	30	25	56
Future Vol, veh/h	61	429	383	30	25	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	442	395	31	26	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	426	0	-	0	978	410
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	568	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1133	-	-	-	278	642
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1133	-	-	-	257	642
Mov Cap-2 Maneuver	-	-	-	-	257	-
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	525	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1133	-	-	-	439
HCM Lane V/C Ratio	0.056	-	-	-	0.19
HCM Control Delay (s)	8.4	0	-	-	15.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

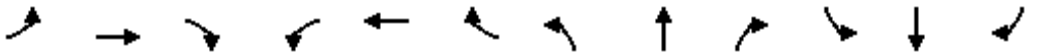
Intersection	
Int Delay, s/veh	20.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	111	203	115	40	262	55	80	90	30	45	40	86
Future Vol, veh/h	111	203	115	40	262	55	80	90	30	45	40	86
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	135	-	-	-	-	275	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	92	92	96	96	92	92	92	96	92	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	116	211	125	43	273	57	87	98	33	47	43	90

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	273	0	0	336	0	0	931	865	274	930	928	273
Stage 1	-	-	-	-	-	-	505	505	-	360	360	-
Stage 2	-	-	-	-	-	-	426	360	-	570	568	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1290	-	-	1223	-	-	247	292	765	248	268	766
Stage 1	-	-	-	-	-	-	549	540	-	658	626	-
Stage 2	-	-	-	-	-	-	606	626	-	506	506	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1290	-	-	1223	-	-	169	254	765	151	233	766
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	254	-	151	233	-
Stage 1	-	-	-	-	-	-	500	491	-	599	599	-
Stage 2	-	-	-	-	-	-	475	599	-	353	460	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.9	89.6	22.6
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	231	1290	-	-	1223	-	-	151	438
HCM Lane V/C Ratio	0.941	0.09	-	-	0.036	-	-	0.31	0.304
HCM Control Delay (s)	89.6	8.1	-	-	8.1	0	-	39.2	16.8
HCM Lane LOS	F	A	-	-	A	A	-	E	C
HCM 95th %tile Q(veh)	8.2	0.3	-	-	0.1	-	-	1.2	1.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	10	70	20	20	25	165	505	20	15	505	192
Future Volume (vph)	163	10	70	20	20	25	165	505	20	15	505	192
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1619		1593	1709		1593	1852		1593	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1619		1593	1709		1593	1852		1593	1863	1549
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	11	76	22	22	27	179	549	22	16	549	209
RTOR Reduction (vph)	0	62	0	0	25	0	0	1	0	0	0	123
Lane Group Flow (vph)	177	25	0	22	24	0	179	570	0	16	549	86
Confl. Peds. (#/hr)												1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	11.1	13.9		2.2	5.0		11.2	42.1		0.9	31.8	31.8
Effective Green, g (s)	11.1	13.9		2.2	5.0		11.2	42.1		0.9	31.8	31.8
Actuated g/C Ratio	0.14	0.18		0.03	0.06		0.15	0.55		0.01	0.41	0.41
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	229	291		45	110		231	1011		18	768	638
v/s Ratio Prot	c0.11	0.02		0.01	c0.01		c0.11	0.31		0.01	c0.29	
v/s Ratio Perm												0.06
v/c Ratio	0.77	0.08		0.49	0.22		0.77	0.56		0.89	0.71	0.14
Uniform Delay, d1	31.8	26.3		36.9	34.2		31.7	11.5		38.1	18.9	14.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.9	0.1		8.1	1.0		14.9	2.3		156.5	5.6	0.4
Delay (s)	46.7	26.4		45.0	35.2		46.7	13.8		194.6	24.5	14.5
Level of Service	D	C		D	D		D	B		F	C	B
Approach Delay (s)		40.0			38.2			21.6			25.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	77.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	60	0	70	429	0	20	58	20	403	160	71	671
Future Volume (vph)	60	0	70	429	0	20	58	20	403	160	71	671
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1710	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1681	1681	1583		1593	1863	1583	1770	3521
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1681	1681	1583		1593	1863	1583	1770	3521
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	0	76	466	0	22	63	22	438	174	77	729
RTOR Reduction (vph)	0	0	70	0	0	17	0	0	0	112	0	2
Lane Group Flow (vph)	0	65	6	233	233	5	0	85	438	62	77	749
Confl. Peds. (#/hr)												
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		5.9	5.9	16.5	16.5	16.5		7.1	26.3	26.3	6.6	25.8
Effective Green, g (s)		5.9	5.9	16.5	16.5	16.5		7.1	26.3	26.3	6.6	25.8
Actuated g/C Ratio		0.08	0.08	0.22	0.22	0.22		0.10	0.35	0.35	0.09	0.35
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		140	126	374	374	352		152	661	561	157	1225
v/s Ratio Prot		c0.04		c0.14	0.14			c0.05	c0.24		0.04	0.21
v/s Ratio Perm			0.00			0.00				0.04		
v/c Ratio		0.46	0.05	0.62	0.62	0.01		0.56	0.66	0.11	0.49	0.61
Uniform Delay, d1		32.6	31.5	26.0	26.0	22.5		32.0	20.2	16.0	32.1	20.0
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9	0.1	3.2	3.2	0.0		2.5	3.2	0.2	2.4	1.3
Delay (s)		33.5	31.6	29.2	29.2	22.5		34.5	23.4	16.2	34.6	21.3
Level of Service		C	C	C	C	C		C	C	B	C	C
Approach Delay (s)		32.4			28.9				23.0			22.5
Approach LOS		C			C				C			C

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	18.8
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	20	454	30	15	694
Future Vol, veh/h	30	20	454	30	15	694
Conflicting Peds, #/hr	0	1	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	22	493	33	16	754

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1298	512	0	0	527	0
Stage 1	511	-	-	-	-	-
Stage 2	787	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	178	562	-	-	1040	-
Stage 1	602	-	-	-	-	-
Stage 2	449	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	173	561	-	-	1039	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	601	-	-	-	-	-
Stage 2	437	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	375	1039	-
HCM Lane V/C Ratio	-	-	0.145	0.016	-
HCM Control Delay (s)	-	-	16.2	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	40	456	28	55	706
Future Vol, veh/h	23	40	456	28	55	706
Conflicting Peds, #/hr	0	2	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	43	496	30	60	767

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1400	515	0	0	528	0
Stage 1	513	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	155	560	-	-	1039	-
Stage 1	601	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	139	558	-	-	1037	-
Mov Cap-2 Maneuver	264	-	-	-	-	-
Stage 1	600	-	-	-	-	-
Stage 2	361	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.9	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	397	1037	-
HCM Lane V/C Ratio	-	-	0.172	0.058	-
HCM Control Delay (s)	-	-	15.9	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

Intersection	
Int Delay, s/veh	53.3

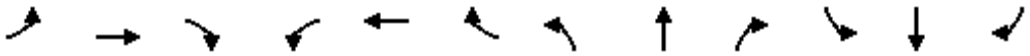
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	10	10	94	10	60	10	427	69	115	707	20
Future Vol, veh/h	15	10	10	94	10	60	10	427	69	115	707	20
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	0	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	11	11	102	11	65	11	464	75	125	768	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1594	1594	783	1567	1567	506	792	0	0	541	0	0
Stage 1	1031	1031	-	525	525	-	-	-	-	-	-	-
Stage 2	563	563	-	1042	1042	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	86	107	394	~ 90	111	566	829	-	-	1028	-	-
Stage 1	281	310	-	536	529	-	-	-	-	-	-	-
Stage 2	511	509	-	277	307	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	56	82	393	~ 65	85	564	827	-	-	1026	-	-
Mov Cap-2 Maneuver	56	82	-	~ 65	85	-	-	-	-	-	-	-
Stage 1	275	242	-	525	518	-	-	-	-	-	-	-
Stage 2	433	498	-	201	240	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	79.3	$ 479	0.2	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	827	-	-	84	98	1026	-	-
HCM Lane V/C Ratio	0.013	-	-	0.453	1.819	0.122	-	-
HCM Control Delay (s)	9.4	0	-	79.3	$ 479	9	0	-
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.9	14.6	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	540	316	270	420	130	166	340	190	215	400	50
Future Volume (vph)	50	540	316	270	420	130	166	340	190	215	400	50
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.5	4.5	3.5	4.5		3.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1557	1593	3539	1563	1593	3331		1593	3475	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1557	1593	3539	1563	1593	3331		1593	3475	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	587	343	293	457	141	180	370	207	234	435	54
RTOR Reduction (vph)	0	0	263	0	0	85	0	86	0	0	11	0
Lane Group Flow (vph)	54	587	80	293	457	56	180	491	0	234	478	0
Confl. Peds. (#/hr)			3						2			2
Confl. Bikes (#/hr)			2			2			1			2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.1	20.2	20.2	18.2	34.3	34.3	12.3	17.2		15.2	20.1	
Effective Green, g (s)	4.1	20.2	20.2	18.2	34.3	34.3	12.3	17.2		15.2	20.1	
Actuated g/C Ratio	0.05	0.23	0.23	0.21	0.40	0.40	0.14	0.20		0.18	0.23	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.5	4.5	3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	75	823	362	334	1398	617	225	660		278	804	
v/s Ratio Prot	0.03	c0.17		c0.18	0.13		0.11	c0.15		c0.15	c0.14	
v/s Ratio Perm			0.05			0.04						
v/c Ratio	0.72	0.71	0.22	0.88	0.33	0.09	0.80	0.74		0.84	0.59	
Uniform Delay, d1	40.8	30.6	26.9	33.2	18.2	16.5	36.1	32.7		34.6	29.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.9	2.5	0.1	21.3	0.1	0.0	17.2	4.0		19.3	0.8	
Delay (s)	64.7	33.1	27.0	54.5	18.3	16.5	53.3	36.7		53.9	30.5	
Level of Service	E	C	C	D	B	B	D	D		D	C	
Approach Delay (s)		32.7			29.9			40.7			38.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	45	30	15	190	30	50	5	90	573	165	40	718
Future Volume (vph)	45	30	15	190	30	50	5	90	573	165	40	718
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.95
Frt	1.00	0.95		1.00	0.91			1.00	0.97		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	1772		1770	1689			1770	3421		1770	3508
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	1772		1770	1689			1770	3421		1770	3508
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	33	16	207	33	54	5	98	623	179	43	780
RTOR Reduction (vph)	0	14	0	0	40	0	0	0	22	0	0	4
Lane Group Flow (vph)	49	35	0	207	47	0	0	103	780	0	43	825
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA		Prot	NA
Protected Phases	5	2		1	6		3	3	8		7	4
Permitted Phases												
Actuated Green, G (s)	4.6	9.8		14.5	19.7			7.9	28.6		4.4	25.1
Effective Green, g (s)	4.6	9.8		14.5	19.7			7.9	28.6		4.4	25.1
Actuated g/C Ratio	0.06	0.13		0.19	0.26			0.10	0.38		0.06	0.33
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	108	230		340	441			185	1299		103	1169
v/s Ratio Prot	0.03	c0.02		c0.12	0.03			c0.06	c0.23		0.02	c0.24
v/s Ratio Perm												
v/c Ratio	0.45	0.15		0.61	0.11			0.56	0.60		0.42	0.71
Uniform Delay, d1	34.1	29.1		27.8	21.1			32.0	18.8		34.2	21.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.0	0.3		3.1	0.1			3.6	0.8		2.7	2.0
Delay (s)	37.1	29.4		30.9	21.2			35.6	19.5		36.9	23.8
Level of Service	D	C		C	C			D	B		D	C
Approach Delay (s)		33.3			28.0				21.4			24.5
Approach LOS		C			C				C			C

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	49
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

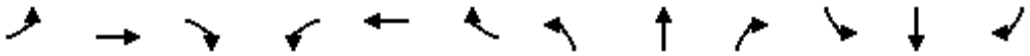
Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	50	618	15	60	758
Future Vol, veh/h	15	50	618	15	60	758
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	54	672	16	65	824

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1222	344	0	0	688	0
Stage 1	680	-	-	-	-	-
Stage 2	542	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	172	652	-	-	902	-
Stage 1	465	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	149	652	-	-	902	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	474	-	-	-	-	-

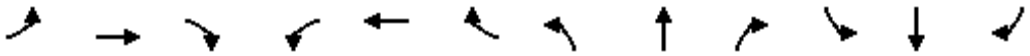
Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	500	902	-
HCM Lane V/C Ratio	-	-	0.141	0.072	-
HCM Control Delay (s)	-	-	13.4	9.3	0.5
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	13	90	20	18	20	55	583	20	25	728	113
Future Volume (vph)	113	13	90	20	18	20	55	583	20	25	728	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.95		1.00	0.99		1.00	0.98	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1687			1718		1577	3484		1577	3422	
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1687			1718		1577	3484		1577	3422	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	122	14	97	22	19	22	59	627	22	27	783	122
RTOR Reduction (vph)	0	27	0	0	21	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	206	0	0	42	0	59	647	0	27	894	0
Confl. Peds. (#/hr)			1						1			4
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		14.1			3.8		4.3	30.0		2.3	28.0	
Effective Green, g (s)		14.1			3.8		4.3	30.0		2.3	28.0	
Actuated g/C Ratio		0.21			0.06		0.06	0.45		0.03	0.42	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		356			97		101	1567		54	1436	
v/s Ratio Prot		c0.12			c0.02		c0.04	0.19		0.02	c0.26	
v/s Ratio Perm												
v/c Ratio		0.58			0.44		0.58	0.41		0.50	0.62	
Uniform Delay, d1		23.6			30.4		30.3	12.4		31.6	15.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.4			1.1		5.4	0.4		2.6	1.2	
Delay (s)		25.1			31.6		35.8	12.8		34.3	16.4	
Level of Service		C			C		D	B		C	B	
Approach Delay (s)		25.1			31.6			14.7			16.9	
Approach LOS		C			C			B			B	

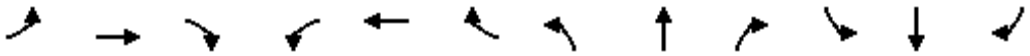
Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	5	30	15	0	5	30	818	10	25	818	35
Future Volume (vph)	40	5	30	15	0	5	30	818	10	25	818	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1706			1737		1593	3531		1593	3514	
Flt Permitted		0.82			0.70		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1438			1271		1593	3531		1593	3514	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	5	32	16	0	5	32	870	11	27	870	37
RTOR Reduction (vph)	0	19	0	0	19	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	61	0	0	2	0	32	880	0	27	904	0
Confl. Peds. (#/hr)			4						4			6
Confl. Bikes (#/hr)									2			
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		8.1			5.0		2.4	26.8		6.2	30.6	
Effective Green, g (s)		8.1			5.0		2.4	26.8		6.2	30.6	
Actuated g/C Ratio		0.13			0.08		0.04	0.43		0.10	0.49	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		186			101		61	1511		157	1717	
v/s Ratio Prot							c0.02	c0.25		0.02	c0.26	
v/s Ratio Perm		c0.04			c0.00							
v/c Ratio		0.33			0.02		0.52	0.58		0.17	0.53	
Uniform Delay, d1		24.8			26.5		29.5	13.6		25.8	11.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.0		3.7	1.2		0.2	0.8	
Delay (s)		25.1			26.6		33.3	14.8		26.0	11.8	
Level of Service		C			C		C	B		C	B	
Approach Delay (s)		25.1			26.6			15.5			12.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	62.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	500	170	264	395	290	145	549	209	365	659	185
Future Volume (vph)	200	500	170	264	395	290	145	549	209	365	659	185
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1541	1593	3539	1543	1593	3363		1593	3399	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1541	1593	3539	1543	1593	3363		1593	3399	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	526	179	278	416	305	153	578	220	384	694	195
RTOR Reduction (vph)	0	0	76	0	0	208	0	27	0	0	17	0
Lane Group Flow (vph)	211	526	103	278	416	97	153	771	0	384	872	0
Confl. Peds. (#/hr)			11			10			14			15
Confl. Bikes (#/hr)			2			3			2			1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	13.2	28.0	28.0	25.8	40.6	40.6	15.0	30.7		26.7	42.1	
Effective Green, g (s)	13.2	28.0	28.0	25.8	40.6	40.6	15.0	30.7		26.7	42.1	
Actuated g/C Ratio	0.10	0.22	0.22	0.20	0.32	0.32	0.12	0.24		0.21	0.33	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	320	777	338	322	1127	491	187	810		333	1123	
v/s Ratio Prot	0.07	c0.15		c0.17	0.12		0.10	c0.23		c0.24	0.26	
v/s Ratio Perm			0.07			0.06						
v/c Ratio	0.66	0.68	0.31	0.86	0.37	0.20	0.82	0.95		1.15	0.78	
Uniform Delay, d1	54.9	45.6	41.6	49.1	33.5	31.6	54.9	47.6		50.4	38.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	3.1	1.1	19.9	0.4	0.4	22.4	21.1		97.6	4.0	
Delay (s)	58.7	48.6	42.6	69.0	33.9	32.0	77.2	68.7		148.0	42.4	
Level of Service	E	D	D	E	C	C	E	E		F	D	
Approach Delay (s)		49.8			43.1			70.1			74.3	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	60.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	127.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	6	478	15	6	712
Future Vol, veh/h	60	6	478	15	6	712
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	7	520	16	7	774

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1315	528	0	0	536	0
Stage 1	528	-	-	-	-	-
Stage 2	787	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	174	550	-	-	1032	-
Stage 1	592	-	-	-	-	-
Stage 2	449	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	173	550	-	-	1032	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.5	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	184	1032	-
HCM Lane V/C Ratio	-	-	0.39	0.006	-
HCM Control Delay (s)	-	-	36.5	8.5	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	1.7	0	-

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	230	26	552	144	0	1006
Future Vol, veh/h	230	26	552	144	0	1006
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	250	28	600	157	0	1093

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1226	379	0	0	-	-
Stage 1	679	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	~ 171	619	-	-	0	-
Stage 1	465	-	-	-	0	-
Stage 2	544	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 171	619	-	-	-	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	544	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	48.9	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBT
Capacity (veh/h)	-	-	306	619	-
HCM Lane V/C Ratio	-	-	0.817	0.046	-
HCM Control Delay (s)	-	-	53.2	11.1	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	6.8	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	5	50	90	365	75	190	5	65	485	395	5
Future Volume (vph)	5	5	50	90	365	75	190	5	65	485	395	5
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1900	1900	1710	1710	1900	1900	1710
Total Lost time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.93	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1593	3539	1562	3090	1648	1504		1593	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1593	3539	1562	3090	1648	1504		1593	3539	1583	
Peak-hour factor, PHF	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.97	0.97	0.97	0.92
Adj. Flow (vph)	5	5	52	93	376	77	196	5	67	500	407	5
RTOR Reduction (vph)	0	0	0	79	0	23	98	0	0	0	209	0
Lane Group Flow (vph)	0	10	52	14	376	119	33	0	72	500	198	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)				1								
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	pm+ov	Prot
Protected Phases	8	8	8		7	7		1	1	6	7	5
Permitted Phases				8			7				6	
Actuated Green, G (s)		14.2	14.2	14.2	23.8	23.8	23.8		9.1	22.9	46.7	
Effective Green, g (s)		14.2	14.2	14.2	23.8	23.8	23.8		9.1	22.9	46.7	
Actuated g/C Ratio		0.15	0.15	0.15	0.25	0.25	0.25		0.09	0.24	0.49	
Clearance Time (s)		4.6	4.6	4.6	4.9	4.9	4.9		4.1	6.5	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	5.0	3.0	
Lane Grp Cap (vph)		235	524	231	766	408	373		151	845	770	
v/s Ratio Prot		0.01	c0.01		c0.12	0.07			0.05	c0.14	0.06	
v/s Ratio Perm				0.01			0.02				0.06	
v/c Ratio		0.04	0.10	0.06	0.49	0.29	0.09		0.48	0.59	0.26	
Uniform Delay, d1		35.0	35.3	35.1	30.9	29.2	27.7		41.1	32.4	14.4	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.1	0.1	0.1	0.5	0.4	0.1		2.4	1.7	0.2	
Delay (s)		35.1	35.4	35.2	31.4	29.6	27.8		43.5	34.0	14.6	
Level of Service		D	D	D	C	C	C		D	C	B	
Approach Delay (s)			35.3			30.3				26.7		
Approach LOS			D			C				C		

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	95.9	Sum of lost time (s)	20.1
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	225	450	20
Future Volume (vph)	225	450	20
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.1	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3090	3539	1537
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3090	3539	1537
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	232	464	21
RTOR Reduction (vph)	0	0	15
Lane Group Flow (vph)	237	464	6
Confl. Peds. (#/hr)			8
Confl. Bikes (#/hr)			
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	14.9	28.7	28.7
Effective Green, g (s)	14.9	28.7	28.7
Actuated g/C Ratio	0.16	0.30	0.30
Clearance Time (s)	4.1	6.5	6.5
Vehicle Extension (s)	3.0	5.0	5.0
Lane Grp Cap (vph)	480	1059	459
v/s Ratio Prot	c0.08	0.13	
v/s Ratio Perm			0.00
v/c Ratio	0.49	0.44	0.01
Uniform Delay, d1	37.0	27.1	23.6
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.6	0.0
Delay (s)	37.9	27.7	23.7
Level of Service	D	C	C
Approach Delay (s)		30.9	
Approach LOS		C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	20	40	545	65	5	265	555	60	5	90	40	335
Future Volume (vph)	20	40	545	65	5	265	555	60	5	90	40	335
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1710	1710	1900	1900
Total Lost time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00		1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1582	3505	1568		1577	3505	1568		1578	1845	1568
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1582	3505	1568		1577	3505	1568		1578	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	43	592	71	5	288	603	65	5	98	43	364
RTOR Reduction (vph)	0	0	0	47	0	0	0	32	0	0	0	317
Lane Group Flow (vph)	0	65	592	24	0	293	603	33	0	103	43	47
Heavy Vehicles (%)	2%	3%	3%	3%	2%	3%	3%	3%	2%	3%	3%	3%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	Split	NA	Perm
Protected Phases	5	5	2		1	1	6		3	3	3	
Permitted Phases				2				6				3
Actuated Green, G (s)		6.7	28.6	28.6		21.9	43.8	43.8		11.1	11.1	11.1
Effective Green, g (s)		6.7	28.6	28.6		21.9	43.8	43.8		11.1	11.1	11.1
Actuated g/C Ratio		0.08	0.33	0.33		0.25	0.51	0.51		0.13	0.13	0.13
Clearance Time (s)		3.5	5.0	5.0		3.5	5.0	5.0		4.5	4.5	4.5
Vehicle Extension (s)		2.0	8.0	8.0		2.0	8.0	8.0		2.0	2.0	2.0
Lane Grp Cap (vph)		123	1164	520		401	1783	797		203	237	202
v/s Ratio Prot		0.04	c0.17			c0.19	0.17			c0.07	0.02	
v/s Ratio Perm				0.02				0.02				0.03
v/c Ratio		0.53	0.51	0.05		0.73	0.34	0.04		0.51	0.18	0.23
Uniform Delay, d1		38.2	23.1	19.5		29.4	12.5	10.6		35.0	33.4	33.7
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		1.9	1.5	0.2		5.8	0.5	0.1		0.7	0.1	0.2
Delay (s)		40.1	24.6	19.6		35.2	13.0	10.7		35.7	33.6	33.9
Level of Service		D	C	B		D	B	B		D	C	C
Approach Delay (s)			25.5				19.6				34.2	
Approach LOS			C				B				C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

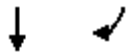


Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	60	40	25
Future Volume (vph)	60	40	25
Ideal Flow (vphpl)	1710	1900	1900
Total Lost time (s)	4.5	4.5	
Lane Util. Factor	1.00	1.00	
Frt	1.00	0.94	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1577	1738	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1577	1738	
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	65	43	27
RTOR Reduction (vph)	0	18	0
Lane Group Flow (vph)	65	52	0
Heavy Vehicles (%)	3%	3%	3%
Turn Type	Split	NA	
Protected Phases	4	4	
Permitted Phases			
Actuated Green, G (s)	7.0	7.0	
Effective Green, g (s)	7.0	7.0	
Actuated g/C Ratio	0.08	0.08	
Clearance Time (s)	4.5	4.5	
Vehicle Extension (s)	2.0	2.0	
Lane Grp Cap (vph)	128	141	
v/s Ratio Prot	c0.04	0.03	
v/s Ratio Perm			
v/c Ratio	0.51	0.37	
Uniform Delay, d1	37.9	37.4	
Progression Factor	1.00	1.00	
Incremental Delay, d2	1.2	0.6	
Delay (s)	39.1	38.0	
Level of Service	D	D	
Approach Delay (s)		38.5	
Approach LOS		D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	70	875	0	5	10	810	180	5	5	0	175
Future Volume (vph)	5	70	875	0	5	10	810	180	5	5	0	175
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95	1.00		1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.98		1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00		
Frt		1.00	1.00			1.00	1.00	0.85		1.00		
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (prot)		1593	3539			1593	3539	1550		1817		
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.98		
Satd. Flow (perm)		1593	3539			1593	3539	1550		1817		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	73	911	0	5	10	844	188	5	5	0	182
RTOR Reduction (vph)	0	0	0	0	0	0	0	108	0	0	0	0
Lane Group Flow (vph)	0	78	911	0	0	15	844	80	0	10	0	0
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA		Prot	Prot	NA	Perm	Split	NA		Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases								6				
Actuated Green, G (s)		6.6	37.1			1.0	31.1	31.1		0.9		
Effective Green, g (s)		6.6	37.1			1.0	31.1	31.1		0.9		
Actuated g/C Ratio		0.09	0.51			0.01	0.43	0.43		0.01		
Clearance Time (s)		3.5	5.3			3.5	5.7	5.7		4.5		
Vehicle Extension (s)		2.0	7.9			2.0	7.3	7.3		2.0		
Lane Grp Cap (vph)		144	1806			21	1513	663		22		
v/s Ratio Prot		c0.05	0.26			0.01	c0.24			c0.01		
v/s Ratio Perm								0.05				
v/c Ratio		0.54	0.50			0.71	0.56	0.12		0.45		
Uniform Delay, d1		31.6	11.7			35.7	15.6	12.6		35.7		
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00		
Incremental Delay, d2		2.2	0.9			65.4	1.2	0.3		5.3		
Delay (s)		33.8	12.7			101.1	16.9	12.9		41.0		
Level of Service		C	B			F	B	B		D		
Approach Delay (s)			14.3				17.4			41.0		
Approach LOS			B				B			D		

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	18.2
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

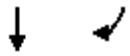


Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	20	70
Future Volume (vph)	20	70
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.96	
Flt Protected	0.97	
Satd. Flow (prot)	1739	
Flt Permitted	0.97	
Satd. Flow (perm)	1739	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	21	73
RTOR Reduction (vph)	11	0
Lane Group Flow (vph)	265	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	15.9	
Effective Green, g (s)	15.9	
Actuated g/C Ratio	0.22	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	380	
v/s Ratio Prot	c0.15	
v/s Ratio Perm		
v/c Ratio	0.70	
Uniform Delay, d1	26.2	
Progression Factor	1.00	
Incremental Delay, d2	4.5	
Delay (s)	30.6	
Level of Service	C	
Approach Delay (s)	30.6	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	25	1015	30	5	25	920	45	15	0	20	50
Future Volume (vph)	5	25	1015	30	5	25	920	45	15	0	20	50
Ideal Flow (vphpl)	1710	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	5.7			3.5	5.7			4.5		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.92		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1593	3524			1593	3511			1684		
Flt Permitted		0.95	1.00			0.95	1.00			0.87		
Satd. Flow (perm)		1593	3524			1593	3511			1502		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	26	1057	31	5	26	958	47	16	0	21	52
RTOR Reduction (vph)	0	0	2	0	0	0	2	0	0	34	0	0
Lane Group Flow (vph)	0	31	1086	0	0	31	1003	0	0	3	0	0
Confl. Bikes (#/hr)								2				
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		2.5	35.1			2.3	34.9			4.7		
Effective Green, g (s)		2.5	35.1			2.3	34.9			4.7		
Actuated g/C Ratio		0.04	0.63			0.04	0.63			0.08		
Clearance Time (s)		3.5	5.7			3.5	5.7			4.5		
Vehicle Extension (s)		2.0	7.3			2.0	7.3			2.0		
Lane Grp Cap (vph)		71	2216			65	2195			126		
v/s Ratio Prot		c0.02	c0.31			0.02	0.29					
v/s Ratio Perm										0.00		
v/c Ratio		0.44	0.49			0.48	0.46			0.02		
Uniform Delay, d1		26.0	5.6			26.2	5.5			23.4		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		1.6	0.6			2.0	0.6			0.0		
Delay (s)		27.5	6.2			28.2	6.0			23.5		
Level of Service		C	A			C	A			C		
Approach Delay (s)			6.8				6.7			23.5		
Approach LOS			A				A			C		

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	13.7
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	0	60
Future Volume (vph)	0	60
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	
Lane Util. Factor	1.00	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.93	
Flt Protected	0.98	
Satd. Flow (prot)	1687	
Flt Permitted	0.84	
Satd. Flow (perm)	1444	
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	0	62
RTOR Reduction (vph)	97	0
Lane Group Flow (vph)	18	0
Confl. Bikes (#/hr)		
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	4.7	
Effective Green, g (s)	4.7	
Actuated g/C Ratio	0.08	
Clearance Time (s)	4.5	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	121	
v/s Ratio Prot		
v/s Ratio Perm	c0.01	
v/c Ratio	0.15	
Uniform Delay, d1	23.7	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	23.9	
Level of Service	C	
Approach Delay (s)	23.9	
Approach LOS	C	

Intersection Summary



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	260	795	10	24	15	790	420	10	20	20	5	708
Future Volume (vph)	260	795	10	24	15	790	420	10	20	20	5	708
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1710
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00		0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (prot)	1593	3532			1593	3539	1563		1833	1583		1513
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (perm)	1593	3532			1593	3539	1563		1833	1583		1513
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	271	828	10	25	16	823	438	10	21	21	5	738
RTOR Reduction (vph)	0	1	0	0	0	0	305	0	0	20	0	0
Lane Group Flow (vph)	271	837	0	0	41	823	133	0	31	1	0	374
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			1				1					
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	Split
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	18.5	43.0			3.8	27.3	27.3		3.1	3.1		23.4
Effective Green, g (s)	18.5	43.0			3.8	27.3	27.3		3.1	3.1		23.4
Actuated g/C Ratio	0.21	0.48			0.04	0.30	0.30		0.03	0.03		0.26
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2		0.2
Lane Grp Cap (vph)	327	1687			67	1073	474		63	54		393
v/s Ratio Prot	c0.17	0.24			0.03	c0.23			c0.02			c0.25
v/s Ratio Perm							0.08			0.00		
v/c Ratio	0.83	0.50			0.61	0.77	0.28		0.49	0.01		0.95
Uniform Delay, d1	34.2	16.1			42.4	28.5	23.9		42.7	42.0		32.7
Progression Factor	1.00	1.00			1.16	0.67	0.74		1.00	1.00		1.00
Incremental Delay, d2	15.1	1.0			9.7	4.6	1.3		2.2	0.0		32.7
Delay (s)	49.3	17.1			59.0	23.7	19.0		44.9	42.0		65.5
Level of Service	D	B			E	C	B		D	D		E
Approach Delay (s)		25.0				23.2			43.7			
Approach LOS		C				C			D			

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	220
Future Volume (vph)	10	220
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.4	4.4
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.95	1.00
Satd. Flow (prot)	1687	1560
Flt Permitted	0.95	1.00
Satd. Flow (perm)	1687	1560
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	10	229
RTOR Reduction (vph)	0	115
Lane Group Flow (vph)	379	114
Confl. Peds. (#/hr)		2
Confl. Bikes (#/hr)		1
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	23.4	23.4
Effective Green, g (s)	23.4	23.4
Actuated g/C Ratio	0.26	0.26
Clearance Time (s)	4.4	4.4
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	438	405
v/s Ratio Prot	0.22	
v/s Ratio Perm		0.07
v/c Ratio	0.87	0.28
Uniform Delay, d1	31.8	26.6
Progression Factor	1.00	1.00
Incremental Delay, d2	15.7	0.1
Delay (s)	47.5	26.7
Level of Service	D	C
Approach Delay (s)	49.5	
Approach LOS	D	

Intersection Summary

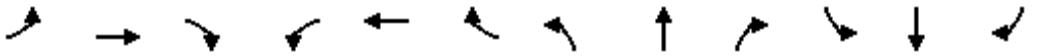
Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	0	1546	0	5	35	1095	351	0	0	35	0	0	124
Future Vol, veh/h	0	1546	0	5	35	1095	351	0	0	35	0	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	50	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	98	98	98	98	98	92	98	92	98	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1578	0	5	36	1117	382	0	0	36	0	0	135

Major/Minor	Major1			Major2				Minor1			Minor2		
Conflicting Flow All	-	0	0	1151	1578	0	0	-	-	789	-	-	749
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	5.64	5.34	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	2.32	3.12	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	362	204	-	-	0	0	286	0	0	304
Stage 1	0	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	0	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-			-	-						
Mov Cap-1 Maneuver	-	-	-	214	214	-	-	-	-	286	-	-	304
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-

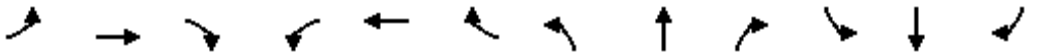
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.7	19.4	25.9
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	286	-	-	214	-	-	304
HCM Lane V/C Ratio	0.125	-	-	0.191	-	-	0.443
HCM Control Delay (s)	19.4	-	-	25.8	-	-	25.9
HCM Lane LOS	C	-	-	D	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	0.7	-	-	2.2



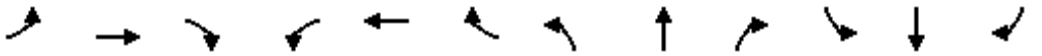
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1164	417	220	866	0	0	0	0	170	0	618
Future Volume (vph)	0	1164	417	220	866	0	0	0	0	170	0	618
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6408	1549	1593	3539						1770	1583
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6408	1549	1593	3539						1770	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1188	426	224	884	0	0	0	0	173	0	631
RTOR Reduction (vph)	0	0	275	0	0	0	0	0	0	0	0	152
Lane Group Flow (vph)	0	1188	151	224	884	0	0	0	0	0	173	479
Confl. Peds. (#/hr)			1									
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		31.8	31.8	16.4	52.4						27.9	27.9
Effective Green, g (s)		31.8	31.8	16.4	52.4						27.9	27.9
Actuated g/C Ratio		0.35	0.35	0.18	0.58						0.31	0.31
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2264	547	290	2060						548	490
v/s Ratio Prot		c0.19		c0.14	0.25						0.10	
v/s Ratio Perm			0.10									c0.30
v/c Ratio		0.52	0.28	0.77	0.43						0.32	0.98
Uniform Delay, d1		23.1	20.8	35.0	10.5						23.7	30.7
Progression Factor		0.89	2.85	0.83	1.13						1.00	1.00
Incremental Delay, d2		0.7	1.0	7.7	0.4						0.2	34.6
Delay (s)		21.2	60.4	36.8	12.3						24.0	65.3
Level of Service		C	E	D	B						C	E
Approach Delay (s)		31.6			17.2			0.0			56.4	
Approach LOS		C			B			A			E	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	684	645	0	0	700	300	396	0	240	0	0	0
Future Volume (vph)	684	645	0	0	700	300	396	0	240	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3090	3539			3539	1563		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3090	3539			3539	1563		1770	1583			
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	712	672	0	0	729	312	412	0	250	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	166	0	0	184	0	0	0
Lane Group Flow (vph)	713	672	0	0	729	147	0	413	66	0	0	0
Confl. Peds. (#/hr)			3			1						
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	23.8	56.7			28.7	28.7		23.6	23.6			
Effective Green, g (s)	23.8	56.7			28.7	28.7		23.6	23.6			
Actuated g/C Ratio	0.26	0.63			0.32	0.32		0.26	0.26			
Clearance Time (s)	4.2	5.1			5.1	5.1		4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0		3.2	3.2			
Lane Grp Cap (vph)	817	2229			1128	498		464	415			
v/s Ratio Prot	c0.23	0.19			c0.21			c0.23				
v/s Ratio Perm						0.09			0.04			
v/c Ratio	0.87	0.30			0.65	0.30		0.89	0.16			
Uniform Delay, d1	31.7	7.6			26.3	23.1		32.0	25.6			
Progression Factor	0.40	0.13			1.26	2.21		1.00	1.00			
Incremental Delay, d2	9.3	0.3			2.4	1.3		18.9	0.2			
Delay (s)	22.0	1.3			35.6	52.2		50.9	25.7			
Level of Service	C	A			D	D		D	C			
Approach Delay (s)		12.0			40.5			41.4			0.0	
Approach LOS		B			D			D			A	

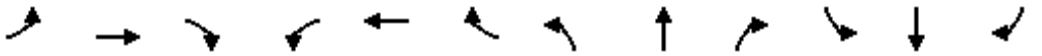
Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	470	20	20	550	135	30	30	10	120	40	390
Future Volume (vph)	380	470	20	20	550	135	30	30	10	120	40	390
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	1.00
Satd. Flow (prot)	3090	3539	1548	1593	3425			1817	1563		1796	1562
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	1.00
Satd. Flow (perm)	3090	3539	1548	1593	3425			1817	1563		1796	1562
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	404	500	21	21	585	144	32	32	11	128	43	415
RTOR Reduction (vph)	0	0	9	0	16	0	0	0	10	0	0	363
Lane Group Flow (vph)	404	500	12	21	713	0	0	64	1	0	171	52
Confl. Peds. (#/hr)			1			1			1			
Confl. Bikes (#/hr)			1			1						1
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2						3			4
Actuated Green, G (s)	14.5	51.0	51.0	2.1	37.7			8.5	8.5		11.2	11.2
Effective Green, g (s)	14.5	51.0	51.0	2.1	37.7			8.5	8.5		11.2	11.2
Actuated g/C Ratio	0.16	0.57	0.57	0.02	0.42			0.09	0.09		0.12	0.12
Clearance Time (s)	4.5	5.8	5.8	3.5	5.7			3.5	3.5		4.4	4.4
Vehicle Extension (s)	0.2	1.5	1.5	0.2	1.5			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	497	2005	877	37	1434			171	147		223	194
v/s Ratio Prot	c0.13	0.14		0.01	c0.21			c0.04			c0.10	
v/s Ratio Perm			0.01						0.00			0.03
v/c Ratio	0.81	0.25	0.01	0.57	0.50			0.37	0.01		0.77	0.27
Uniform Delay, d1	36.4	9.8	8.5	43.5	19.2			38.3	36.9		38.1	35.7
Progression Factor	0.83	1.62	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	9.0	0.3	0.0	11.3	1.2			0.5	0.0		13.2	0.3
Delay (s)	39.3	16.2	8.5	54.8	20.4			38.8	36.9		51.3	35.9
Level of Service	D	B	A	D	C			D	D		D	D
Approach Delay (s)		26.1			21.4			38.5			40.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	530	5	0	585	30	10	0	5	15	0	90
Future Volume (Veh/h)	75	530	5	0	585	30	10	0	5	15	0	90
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	78	552	5	0	609	31	10	0	5	16	0	94
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		354										
pX, platoon unblocked				0.89			0.89	0.89	0.89	0.89	0.89	
vC, conflicting volume	640			557			1109	1350	554	1340	1338	320
vC1, stage 1 conf vol							710	710		624	624	
vC2, stage 2 conf vol							398	640		716	713	
vCu, unblocked vol	640			440			1061	1332	438	1320	1317	320
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			97	100	99	94	100	86
cM capacity (veh/h)	940			993			298	295	504	286	319	676

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	635	304	336	15	16	94
Volume Left	78	0	0	10	16	0
Volume Right	5	0	31	5	0	94
cSH	940	993	1700	345	286	676
Volume to Capacity	0.08	0.00	0.20	0.04	0.06	0.14
Queue Length 95th (ft)	7	0	0	3	4	12
Control Delay (s)	2.1	0.0	0.0	15.9	18.4	11.2
Lane LOS	A			C	C	B
Approach Delay (s)	2.1	0.0		15.9	12.2	
Approach LOS				C	B	

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	67.0%	ICU Level of Service		C
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	505	30	25	590	25	10
Future Vol, veh/h	505	30	25	590	25	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	532	32	26	621	26	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	563	0	1221	547
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	674	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1008	-	199	537
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	506	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1008	-	191	537
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	486	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	23.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	234	-	-	1008	-
HCM Lane V/C Ratio	0.157	-	-	0.026	-
HCM Control Delay (s)	23.2	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	490	15	5	580	40	5	0	20	65	0	30
Future Vol, veh/h	30	490	15	5	580	40	5	0	20	65	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	527	16	5	624	43	5	0	22	70	0	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	667	0	0	543	0	0	1271	1276	535	1266	1264	645
Stage 1	-	-	-	-	-	-	599	599	-	656	656	-
Stage 2	-	-	-	-	-	-	672	677	-	610	608	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	923	-	-	1026	-	-	145	167	545	146	169	472
Stage 1	-	-	-	-	-	-	488	490	-	454	462	-
Stage 2	-	-	-	-	-	-	445	452	-	482	486	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	923	-	-	1026	-	-	129	157	545	134	159	472
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	157	-	134	159	-
Stage 1	-	-	-	-	-	-	464	466	-	431	458	-
Stage 2	-	-	-	-	-	-	411	448	-	440	462	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.1	16.8	52.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	331	923	-	-	1026	-	-	173
HCM Lane V/C Ratio	0.081	0.035	-	-	0.005	-	-	0.59
HCM Control Delay (s)	16.8	9	0	-	8.5	0	-	52.1
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	3.2

Intersection	
Int Delay, s/veh	13.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	150	375	395	75	75	215
Future Vol, veh/h	150	375	395	75	75	215
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	163	408	429	82	82	234

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	511	0	-	0	1204	470
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	734	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1054	-	-	-	203	594
Stage 1	-	-	-	-	629	-
Stage 2	-	-	-	-	475	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1054	-	-	-	172	594
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	629	-
Stage 2	-	-	-	-	402	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	54.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1054	-	-	-	363
HCM Lane V/C Ratio	0.155	-	-	-	0.868
HCM Control Delay (s)	9	-	-	-	54.2
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	8.3

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	265	185	170	20	20	315
Future Vol, veh/h	265	185	170	20	20	315
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	288	201	185	22	22	342

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	207	0	-	0	973	196
Stage 1	-	-	-	-	196	-
Stage 2	-	-	-	-	777	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1364	-	-	-	280	845
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	453	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1364	-	-	-	221	845
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	357	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1364	-	-	-	723
HCM Lane V/C Ratio	0.211	-	-	-	0.504
HCM Control Delay (s)	8.3	-	-	-	14.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.8	-	-	-	2.9

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	275	295	30	35	70
Future Vol, veh/h	40	275	295	30	35	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	286	307	31	36	73

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	339	0	-	0	693	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	370	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1220	-	-	-	409	718
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1220	-	-	-	392	718
Mov Cap-2 Maneuver	-	-	-	-	392	-
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	670	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1220	-	-	-	562
HCM Lane V/C Ratio	0.034	-	-	-	0.195
HCM Control Delay (s)	8.1	0	-	-	12.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

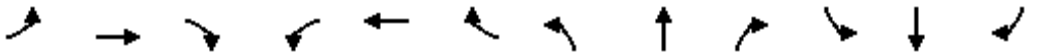
Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	150	80	30	175	40	55	65	20	50	30	75
Future Vol, veh/h	75	150	80	30	175	40	55	65	20	50	30	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	135	-	-	-	-	275	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	92	92	94	94	92	92	92	94	92	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	80	160	87	33	186	43	60	71	22	53	33	80

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	186	0	0	247	0	0	671	614	203	660	657	186
Stage 1	-	-	-	-	-	-	363	363	-	251	251	-
Stage 2	-	-	-	-	-	-	308	251	-	409	406	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1388	-	-	1319	-	-	370	407	838	376	385	856
Stage 1	-	-	-	-	-	-	656	625	-	753	699	-
Stage 2	-	-	-	-	-	-	702	699	-	619	598	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1388	-	-	1319	-	-	292	372	838	293	352	856
Mov Cap-2 Maneuver	-	-	-	-	-	-	292	372	-	293	352	-
Stage 1	-	-	-	-	-	-	618	589	-	710	679	-
Stage 2	-	-	-	-	-	-	588	679	-	500	564	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	1	22	14.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	362	1388	-	-	1319	-	-	293	605
HCM Lane V/C Ratio	0.42	0.057	-	-	0.025	-	-	0.182	0.186
HCM Control Delay (s)	22	7.8	-	-	7.8	0	-	20	12.3
HCM Lane LOS	C	A	-	-	A	A	-	C	B
HCM 95th %tile Q(veh)	2	0.2	-	-	0.1	-	-	0.7	0.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	20	75	5	15	20	85	365	15	15	315	145
Future Volume (vph)	170	20	75	5	15	20	85	365	15	15	315	145
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1593	1607		1593	1678		1593	1850		1593	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1593	1607		1593	1678		1593	1850		1593	1863	1548
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	21	79	5	16	21	89	384	16	16	332	153
RTOR Reduction (vph)	0	62	0	0	20	0	0	1	0	0	0	100
Lane Group Flow (vph)	179	38	0	5	17	0	89	399	0	16	332	53
Confl. Peds. (#/hr)									1			
Confl. Bikes (#/hr)			4			1			2			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.0	11.3		0.7	3.0		5.3	23.1		0.7	18.5	18.5
Effective Green, g (s)	9.0	11.3		0.7	3.0		5.3	23.1		0.7	18.5	18.5
Actuated g/C Ratio	0.17	0.21		0.01	0.06		0.10	0.43		0.01	0.34	0.34
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	266	337		20	93		156	794		20	640	532
v/s Ratio Prot	c0.11	c0.02		0.00	0.01		c0.06	c0.22		0.01	0.18	
v/s Ratio Perm												0.03
v/c Ratio	0.67	0.11		0.25	0.18		0.57	0.50		0.80	0.52	0.10
Uniform Delay, d1	21.0	17.2		26.3	24.2		23.2	11.2		26.5	14.1	12.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.6	0.1		6.5	1.0		5.0	0.5		110.1	0.7	0.1
Delay (s)	27.6	17.3		32.8	25.2		28.1	11.7		136.6	14.8	12.1
Level of Service	C	B		C	C		C	B		F	B	B
Approach Delay (s)		23.9			26.1			14.7			17.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	0	10	515	0	30	58	10	333	211	90	358
Future Volume (vph)	10	0	10	515	0	30	58	10	333	211	90	358
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1710	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00		1.00	1.00	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1583	1681	1681	1583		1593	1863	1583	1770	3531
Flt Permitted		0.95	1.00	0.95	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1583	1681	1681	1583		1593	1863	1583	1770	3531
Peak-hour factor, PHF	0.93	0.92	0.93	0.92	0.92	0.92	0.92	0.93	0.93	0.92	0.92	0.93
Adj. Flow (vph)	11	0	11	560	0	33	63	11	358	229	98	385
RTOR Reduction (vph)	0	0	11	0	0	24	0	0	0	150	0	1
Lane Group Flow (vph)	0	11	0	280	280	9	0	74	358	79	98	389
Confl. Bikes (#/hr)												
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	4	4		8	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)		1.8	1.8	19.4	19.4	19.4		6.4	24.9	24.9	6.9	25.4
Effective Green, g (s)		1.8	1.8	19.4	19.4	19.4		6.4	24.9	24.9	6.9	25.4
Actuated g/C Ratio		0.03	0.03	0.27	0.27	0.27		0.09	0.35	0.35	0.10	0.35
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5		4.5	5.3	5.3	4.5	5.3
Vehicle Extension (s)		2.0	2.0	3.0	3.0	3.0		2.0	4.9	4.9	3.0	4.9
Lane Grp Cap (vph)		44	39	454	454	427		141	646	548	170	1249
v/s Ratio Prot		c0.01		c0.17	0.17			0.05	c0.19		c0.06	0.11
v/s Ratio Perm			0.00			0.01				0.05		
v/c Ratio		0.25	0.01	0.62	0.62	0.02		0.52	0.55	0.14	0.58	0.31
Uniform Delay, d1		34.3	34.1	22.9	22.9	19.2		31.2	19.0	16.1	31.1	16.9
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.0	2.5	2.5	0.0		1.6	1.7	0.2	4.7	0.3
Delay (s)		35.4	34.2	25.4	25.4	19.2		32.9	20.7	16.4	35.7	17.1
Level of Service		D	C	C	C	B		C	C	B	D	B
Approach Delay (s)		34.8			25.1				20.5			20.9
Approach LOS		C			C				C			C

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	18.8
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	25	355	35	20	380
Future Vol, veh/h	30	25	355	35	20	380
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	27	386	38	22	413

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	862	405	0	0	424	0
Stage 1	405	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	325	646	-	-	1135	-
Stage 1	673	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	317	646	-	-	1135	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	673	-	-	-	-	-
Stage 2	622	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	514	1135	-
HCM Lane V/C Ratio	-	-	0.116	0.019	-
HCM Control Delay (s)	-	-	12.9	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	45	345	20	40	375
Future Vol, veh/h	20	45	345	20	40	375
Conflicting Peds, #/hr	0	0	0	1	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	47	363	21	42	395

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	854	375	0	0	385	0
Stage 1	375	-	-	-	-	-
Stage 2	479	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	329	671	-	-	1173	-
Stage 1	695	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	314	670	-	-	1173	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	574	1173	-
HCM Lane V/C Ratio	-	-	0.119	0.036	-
HCM Control Delay (s)	-	-	12.1	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

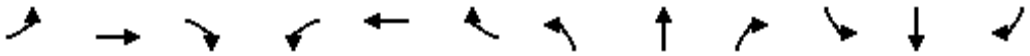
Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	5	30	65	20	45	15	325	55	40	320	10
Future Vol, veh/h	20	5	30	65	20	45	15	325	55	40	320	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	5	32	69	21	48	16	346	59	43	340	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	872	868	346	857	844	376	351	0	0	405	0	0
Stage 1	431	431	-	408	408	-	-	-	-	-	-	-
Stage 2	441	437	-	449	436	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	271	290	697	277	300	670	1208	-	-	1154	-	-
Stage 1	603	583	-	620	597	-	-	-	-	-	-	-
Stage 2	595	579	-	589	580	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	226	272	697	248	281	669	1208	-	-	1154	-	-
Mov Cap-2 Maneuver	226	272	-	248	281	-	-	-	-	-	-	-
Stage 1	593	556	-	609	586	-	-	-	-	-	-	-
Stage 2	523	569	-	531	553	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	24	0.3	0.9
HCM LOS	C	C		

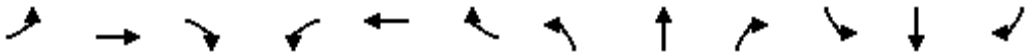
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1208	-	-	367	325	1154	-	-
HCM Lane V/C Ratio	0.013	-	-	0.159	0.426	0.037	-	-
HCM Control Delay (s)	8	0	-	16.7	24	8.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	2	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	255	125	160	275	115	105	250	120	135	230	35
Future Volume (vph)	20	255	125	160	275	115	105	250	120	135	230	35
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	3539	1561	1593	3539	1557	1593	3352		1593	3462	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1593	3539	1561	1593	3539	1557	1593	3352		1593	3462	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	271	133	170	293	122	112	266	128	144	245	37
RTOR Reduction (vph)	0	0	104	0	0	79	0	56	0	0	11	0
Lane Group Flow (vph)	21	271	29	170	293	43	112	338	0	144	271	0
Confl. Peds. (#/hr)						6			2			5
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.2	15.9	15.9	12.5	26.2	26.2	8.4	16.8		11.4	19.8	
Effective Green, g (s)	2.2	15.9	15.9	12.5	26.2	26.2	8.4	16.8		11.4	19.8	
Actuated g/C Ratio	0.03	0.22	0.22	0.17	0.36	0.36	0.11	0.23		0.15	0.27	
Clearance Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	47	764	337	270	1259	554	181	765		246	931	
v/s Ratio Prot	0.01	c0.08		c0.11	0.08		0.07	c0.10		c0.09	c0.08	
v/s Ratio Perm			0.02			0.03						
v/c Ratio	0.45	0.35	0.09	0.63	0.23	0.08	0.62	0.44		0.59	0.29	
Uniform Delay, d1	35.1	24.5	23.0	28.4	16.6	15.7	31.1	24.4		28.9	21.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.6	0.2	3.3	0.2	0.1	4.4	0.9		2.3	0.4	
Delay (s)	37.6	25.1	23.3	31.7	16.8	15.8	35.4	25.2		31.2	21.7	
Level of Service	D	C	C	C	B	B	D	C		C	C	
Approach Delay (s)		25.1			20.9			27.5			24.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	73.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	35	25	225	35	60	115	440	210	50	445	60
Future Volume (vph)	55	35	25	225	35	60	115	440	210	50	445	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.91		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1749		1770	1686		1770	3363		1770	3465	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1749		1770	1686		1770	3363		1770	3465	
Peak-hour factor, PHF	0.96	0.92	0.96	0.92	0.92	0.92	0.96	0.96	0.92	0.92	0.96	0.96
Adj. Flow (vph)	57	38	26	245	38	65	120	458	228	54	464	62
RTOR Reduction (vph)	0	22	0	0	45	0	0	57	0	0	10	0
Lane Group Flow (vph)	57	42	0	245	58	0	120	629	0	54	517	0
Confl. Peds. (#/hr)												2
Confl. Bikes (#/hr)												2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.7	10.2		15.5	21.0		8.2	21.5		4.6	17.9	
Effective Green, g (s)	4.7	10.2		15.5	21.0		8.2	21.5		4.6	17.9	
Actuated g/C Ratio	0.07	0.15		0.22	0.30		0.12	0.31		0.07	0.26	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	119	255		393	507		207	1035		116	888	
v/s Ratio Prot	0.03	c0.02		c0.14	0.03		c0.07	c0.19		0.03	0.15	
v/s Ratio Perm												
v/c Ratio	0.48	0.16		0.62	0.11		0.58	0.61		0.47	0.58	
Uniform Delay, d1	31.4	26.1		24.5	17.7		29.2	20.6		31.4	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.3		3.1	0.1		3.9	1.0		2.9	1.0	
Delay (s)	34.4	26.4		27.6	17.8		33.1	21.6		34.4	23.7	
Level of Service	C	C		C	B		C	C		C	C	
Approach Delay (s)		30.2			24.7			23.3			24.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

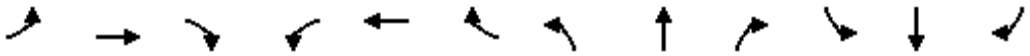
Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	90	470	25	45	480
Future Vol, veh/h	20	90	470	25	45	480
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	97	505	27	48	516

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	874	266	0	0	532	0
Stage 1	519	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	289	732	-	-	1032	-
Stage 1	562	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	270	732	-	-	1032	-
Mov Cap-2 Maneuver	395	-	-	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	637	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.9
HCM LOS	B		

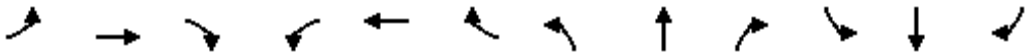
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	634	1032	-
HCM Lane V/C Ratio	-	-	0.187	0.047	-
HCM Control Delay (s)	-	-	12	8.7	0.2
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	5	30	30	20	10	45	500	10	10	520	70
Future Volume (vph)	50	5	30	30	20	10	45	500	10	10	520	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.98		1.00	1.00		1.00	0.98	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1715			1776		1593	3527		1593	3468	
Flt Permitted		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1715			1776		1593	3527		1593	3468	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	5	32	32	22	11	48	538	11	11	559	75
RTOR Reduction (vph)	0	22	0	0	9	0	0	1	0	0	11	0
Lane Group Flow (vph)	0	69	0	0	56	0	48	548	0	11	623	0
Confl. Peds. (#/hr)			2						1			
Confl. Bikes (#/hr)									2			1
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		9.3			6.9		3.8	21.6		0.8	18.6	
Effective Green, g (s)		9.3			6.9		3.8	21.6		0.8	18.6	
Actuated g/C Ratio		0.17			0.13		0.07	0.39		0.01	0.34	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	4.9		2.0	4.9	
Lane Grp Cap (vph)		289			222		109	1382		23	1170	
v/s Ratio Prot		c0.04			c0.03		c0.03	c0.16		0.01	c0.18	
v/s Ratio Perm												
v/c Ratio		0.24			0.25		0.44	0.40		0.48	0.53	
Uniform Delay, d1		19.8			21.8		24.6	12.1		26.9	14.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.2		1.0	0.4		5.6	0.8	
Delay (s)		20.0			22.0		25.7	12.4		32.5	15.6	
Level of Service		B			C		C	B		C	B	
Approach Delay (s)		20.0			22.0			13.5			15.9	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

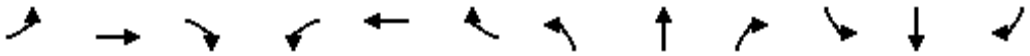
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	20	5	0	0	20	585	10	15	580	20
Future Volume (vph)	25	0	20	5	0	0	20	585	10	15	580	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1692			1770		1593	3528		1593	3518	
Flt Permitted		0.83			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1436			1863		1593	3528		1593	3518	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	27	0	22	5	0	0	22	629	11	16	624	22
RTOR Reduction (vph)	0	44	0	0	0	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	5	0	0	5	0	22	639	0	16	644	0
Confl. Peds. (#/hr)			5			8			7			
Confl. Bikes (#/hr)									1			3
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			3		5	2		1	6	
Permitted Phases	4			3								
Actuated Green, G (s)		4.7			0.6		0.8	21.9		6.0	27.1	
Effective Green, g (s)		4.7			0.6		0.8	21.9		6.0	27.1	
Actuated g/C Ratio		0.09			0.01		0.02	0.44		0.12	0.55	
Clearance Time (s)		4.5			3.5		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	6.5		2.0	6.5	
Lane Grp Cap (vph)		135			22		25	1554		192	1918	
v/s Ratio Prot							c0.01	c0.18		0.01	c0.18	
v/s Ratio Perm		c0.00			c0.00							
v/c Ratio		0.03			0.23		0.88	0.41		0.08	0.34	
Uniform Delay, d1		20.4			24.3		24.4	9.5		19.4	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			1.9		124.9	0.6		0.1	0.3	
Delay (s)		20.5			26.2		149.3	10.1		19.5	6.6	
Level of Service		C			C		F	B		B	A	
Approach Delay (s)		20.5			26.2			14.7			6.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	16.5
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	240	90	190	260	335	100	435	145	285	440	170
Future Volume (vph)	110	240	90	190	260	335	100	435	145	285	440	170
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1710	1900	1900	1710	1900	1900
Total Lost time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3090	3539	1544	1593	3539	1551	1593	3390		1593	3375	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3090	3539	1544	1593	3539	1551	1593	3390		1593	3375	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	116	253	95	200	274	353	105	458	153	300	463	179
RTOR Reduction (vph)	0	0	79	0	0	264	0	27	0	0	34	0
Lane Group Flow (vph)	116	253	16	200	274	89	105	584	0	300	608	0
Confl. Peds. (#/hr)			4			10			5			4
Confl. Bikes (#/hr)			7						2			3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.0	16.0	16.0	16.5	24.5	24.5	9.1	26.2		22.7	39.5	
Effective Green, g (s)	8.0	16.0	16.0	16.5	24.5	24.5	9.1	26.2		22.7	39.5	
Actuated g/C Ratio	0.08	0.16	0.16	0.17	0.25	0.25	0.09	0.27		0.23	0.40	
Clearance Time (s)	3.5	4.6	4.6	3.5	4.6	4.6	3.5	4.6		3.5	4.9	
Vehicle Extension (s)	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	253	580	253	269	888	389	148	910		370	1365	
v/s Ratio Prot	0.04	c0.07		c0.13	0.08		0.07	c0.17		c0.19	0.18	
v/s Ratio Perm			0.01			0.06						
v/c Ratio	0.46	0.44	0.06	0.74	0.31	0.23	0.71	0.64		0.81	0.45	
Uniform Delay, d1	42.7	36.7	34.5	38.5	29.7	29.0	43.0	31.6		35.4	21.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.1	0.2	9.3	0.4	0.6	12.0	2.1		12.0	0.5	
Delay (s)	43.2	37.8	34.7	47.9	30.1	29.7	54.9	33.7		47.4	21.6	
Level of Service	D	D	C	D	C	C	D	C		D	C	
Approach Delay (s)		38.5			34.2			36.8			29.8	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	10	375	25	19	391
Future Vol, veh/h	80	10	375	25	19	391
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	11	408	27	21	425

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	887	421	0	0	435	0
Stage 1	421	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Critical Hdwy	7.12	6.22	-	-	4.12	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	265	632	-	-	1125	-
Stage 1	610	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	261	632	-	-	1125	-
Mov Cap-2 Maneuver	261	-	-	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.7	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	279	1125	-
HCM Lane V/C Ratio	-	-	0.351	0.018	-
HCM Control Delay (s)	-	-	24.7	8.3	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0.1	-

Intersection	
Int Delay, s/veh	5.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	232	52	467	195	0	717
Future Vol, veh/h	232	52	467	195	0	717
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	252	57	508	212	0	779

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1004	360	0	0	-	-
Stage 1	614	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	-
Pot Cap-1 Maneuver	~ 238	637	-	-	0	-
Stage 1	502	-	-	-	0	-
Stage 2	653	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 238	637	-	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	502	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBT
Capacity (veh/h)	-	-	365	637	-
HCM Lane V/C Ratio	-	-	0.691	0.089	-
HCM Control Delay (s)	-	-	34.2	11.2	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	5	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	290	335	201	66	228	214	134	80	50	124	95	102
Average Queue (ft)	153	128	60	18	108	120	53	28	15	57	34	48
95th Queue (ft)	249	269	147	50	184	187	107	62	45	109	77	90
Link Distance (ft)		502	502		303	303	303	178		691	691	
Upstream Blk Time (%)					0							
Queuing Penalty (veh)					0							
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	5	1			3			30	4		0	1
Queuing Penalty (veh)	23	3			1			5	1		0	1

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	263	298	236	145	221	123	133	173	383
Average Queue (ft)	152	140	63	44	84	46	41	50	188
95th Queue (ft)	286	316	171	105	173	106	101	117	331
Link Distance (ft)		339	339		390	390	390		455
Upstream Blk Time (%)		4	0						0
Queuing Penalty (veh)		21	1						0
Storage Bay Dist (ft)	250			250				175	
Storage Blk Time (%)	10	4	0	0					14
Queuing Penalty (veh)	31	12	0	0					12

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	436	421	310	217	214	176	457	264
Average Queue (ft)	345	227	56	105	92	63	224	61
95th Queue (ft)	496	488	211	188	175	134	386	205
Link Distance (ft)	390	390	390	233	233		558	
Upstream Blk Time (%)	15	4	0	0	0	0	0	
Queuing Penalty (veh)	48	14	0	1	1	0	0	
Storage Bay Dist (ft)						110		285
Storage Blk Time (%)					4	2	5	0
Queuing Penalty (veh)					13	4	9	1

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	B64	B64	NB	NB	SB
Directions Served	UL	L	T	T	R	T	TR	T	T	LT	R	LT
Maximum Queue (ft)	186	217	211	206	12	166	188	16	62	37	20	161
Average Queue (ft)	105	121	42	23	1	55	90	1	4	7	1	57
95th Queue (ft)	181	196	155	114	7	124	174	11	39	28	11	119
Link Distance (ft)			233	233		126	126	83	83	135	135	596
Upstream Blk Time (%)		1	1	1		1	4		0			
Queuing Penalty (veh)		0	5	3		2	13		1			
Storage Bay Dist (ft)	130	130			115							
Storage Blk Time (%)	9	14	1	0		5						
Queuing Penalty (veh)	17	25	2	0		0						

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

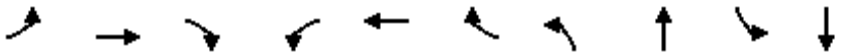
Movement	SB
Directions Served	R
Maximum Queue (ft)	133
Average Queue (ft)	60
95th Queue (ft)	103
Link Distance (ft)	596
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	B64	WB	WB	SB	SB
Directions Served	LTR	T		LT	TR	L	R
Maximum Queue (ft)	149	110	43	5	17	40	73
Average Queue (ft)	28	8	2	0	1	8	38
95th Queue (ft)	94	53	22	4	10	29	64
Link Distance (ft)	83	126	126	637	637	141	141
Upstream Blk Time (%)	1	0	0				
Queuing Penalty (veh)	4	0	0				
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 276



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	252	115	241	469	197	311	570	151	360
v/c Ratio	0.12	0.41	0.30	0.79	0.34	0.27	0.84	0.56	0.65	0.52
Control Delay	49.2	35.4	6.5	55.1	20.6	4.4	55.5	24.9	51.0	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	35.4	6.5	55.1	20.6	4.4	55.5	24.9	51.0	32.0
Queue Length 50th (ft)	6	64	0	120	87	0	153	103	77	82
Queue Length 95th (ft)	24	99	14	222	148	23	#334	167	143	123
Internal Link Dist (ft)		589			2551			534		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	259	908	496	413	1442	747	413	1033	413	905
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.28	0.23	0.58	0.33	0.26	0.75	0.55	0.37	0.40

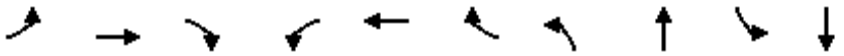
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	45	117	527	10	435
v/c Ratio	0.54	0.22	0.45	0.31	0.06	0.38
Control Delay	24.9	25.8	32.5	12.6	35.0	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	25.8	32.5	12.6	35.0	14.9
Queue Length 50th (ft)	53	8	34	52	3	42
Queue Length 95th (ft)	152	48	117	161	22	117
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	586	582	521	2152	363	1719
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.08	0.22	0.24	0.03	0.25

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	284	133	248	449	230	241	816	121	530
v/c Ratio	0.50	0.36	0.31	0.79	0.39	0.36	0.93	0.79	0.63	0.60
Control Delay	56.5	36.7	9.9	60.7	27.6	5.7	89.3	43.4	62.9	38.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	36.7	9.9	60.7	27.6	5.7	89.3	43.4	62.9	38.4
Queue Length 50th (ft)	52	86	5	178	120	5	~197	301	87	180
Queue Length 95th (ft)	93	146	58	288	184	59	#420	#508	161	260
Internal Link Dist (ft)		2551			673			1892		285
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1111	1234	608	494	1367	721	259	1032	415	1362
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.23	0.22	0.50	0.33	0.32	0.93	0.79	0.29	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	190	312	264	56	223	231	87	97	71	239	284	186
Average Queue (ft)	75	116	81	19	118	136	29	37	17	127	105	83
95th Queue (ft)	145	237	184	50	198	212	62	79	52	203	201	160
Link Distance (ft)		509	509		309	309	309	178		682	682	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)		1			4			40	6		8	4
Queuing Penalty (veh)		2			1			8	2		20	7

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	UL	T	T	LT	R
Maximum Queue (ft)	255	247	157	212	223	134	136	211	295
Average Queue (ft)	124	106	65	85	126	45	41	84	146
95th Queue (ft)	207	188	132	169	214	105	105	164	264
Link Distance (ft)		339	339		390	390	390		455
Upstream Blk Time (%)		0							
Queuing Penalty (veh)		0							
Storage Bay Dist (ft)	250			250				175	
Storage Blk Time (%)	0	0		0				2	6
Queuing Penalty (veh)	1	1		0				9	10

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	431	374	304	243	228	164	252	133
Average Queue (ft)	280	117	52	146	110	37	130	52
95th Queue (ft)	442	330	172	236	196	97	216	98
Link Distance (ft)	390	390	390	233	233		558	
Upstream Blk Time (%)	4	1	0	1	0	0		
Queuing Penalty (veh)	16	4	0	3	0	0		
Storage Bay Dist (ft)						110		285
Storage Blk Time (%)					8	0	0	
Queuing Penalty (veh)					14	1	0	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	NB	NB	SB
Directions Served	UL	L	T	T	R	L	T	TR	T	LT	R	LT
Maximum Queue (ft)	184	229	252	204	48	16	166	190	19	37	25	212
Average Queue (ft)	95	117	77	51	3	1	65	74	1	7	2	88
95th Queue (ft)	173	196	194	148	28	9	131	153	11	29	14	169
Link Distance (ft)			233	233			126	126	83	135	135	596
Upstream Blk Time (%)		1	1	0			1	2				
Queuing Penalty (veh)		0	2	1			4	6				
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	4	11	2	1			7					
Queuing Penalty (veh)	12	29	5	0			0					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

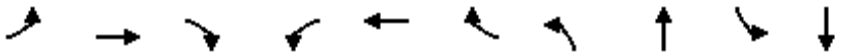
Movement	SB
Directions Served	R
Maximum Queue (ft)	192
Average Queue (ft)	78
95th Queue (ft)	142
Link Distance (ft)	596
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	B64	WB	WB	NB	SB	SB
Directions Served	LTR	T		LT	TR	LTR	L	R
Maximum Queue (ft)	161	210	131	11	11	31	45	72
Average Queue (ft)	64	42	15	0	0	9	12	34
95th Queue (ft)	152	144	69	5	5	31	36	60
Link Distance (ft)	83	126	126	642	642	109	141	141
Upstream Blk Time (%)	3	1	0					
Queuing Penalty (veh)	21	5	1					
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Zone Summary

Zone wide Queuing Penalty: 185



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	44	398	292	262	321	116	142	460	178	345
v/c Ratio	0.33	0.53	0.52	0.80	0.23	0.17	0.61	0.59	0.69	0.45
Control Delay	49.9	34.3	7.9	54.4	21.4	5.9	49.4	26.5	51.2	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	34.3	7.9	54.4	21.4	5.9	49.4	26.5	51.2	31.0
Queue Length 50th (ft)	22	98	0	128	62	0	71	83	89	79
Queue Length 95th (ft)	70	187	70	#356	134	41	167	166	206	155
Internal Link Dist (ft)		524			2561			556		279
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	270	943	629	430	1411	692	430	983	430	947
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.42	0.46	0.61	0.23	0.17	0.33	0.47	0.41	0.36

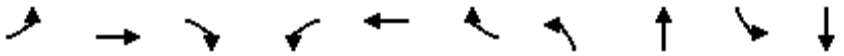
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	143	22	32	377	19	583
v/c Ratio	0.36	0.10	0.15	0.18	0.09	0.31
Control Delay	16.2	19.0	26.6	9.9	27.4	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	19.0	26.6	9.9	27.4	12.0
Queue Length 50th (ft)	14	1	4	15	3	25
Queue Length 95th (ft)	88	26	44	117	31	184
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	737	702	666	2666	464	2209
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.03	0.05	0.14	0.04	0.26

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	175	469	104	199	400	276	104	573	366	681
v/c Ratio	0.57	0.61	0.25	0.74	0.40	0.43	0.63	0.72	0.95	0.55
Control Delay	58.3	44.6	10.8	63.0	33.8	5.9	68.5	43.6	80.5	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	44.6	10.8	63.0	33.8	5.9	68.5	43.6	80.5	31.9
Queue Length 50th (ft)	63	163	4	139	123	0	73	183	265	196
Queue Length 95th (ft)	113	246	52	243	182	61	150	294	#581	335
Internal Link Dist (ft)		2561			657			1869		306
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1026	1140	561	456	1112	673	239	957	384	1269
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.41	0.19	0.44	0.36	0.41	0.44	0.60	0.95	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	UL	LT	R
Maximum Queue (ft)	168	174	98	37	136	146	46	65	56	117	105	85
Average Queue (ft)	66	55	23	10	44	65	15	18	10	56	34	41
95th Queue (ft)	126	124	68	31	104	119	40	48	36	104	79	75
Link Distance (ft)		506	506		309	309	309	178		690	690	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	0	0			0			20	2		0	0
Queuing Penalty (veh)	1	0			0			2	0		0	0

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	141	121	88	95	187	84	91	128	146
Average Queue (ft)	61	41	17	19	78	16	17	58	79
95th Queue (ft)	125	94	56	58	156	54	61	110	126
Link Distance (ft)		339	339		390	390	390		455
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250			250				175	
Storage Blk Time (%)								0	0
Queuing Penalty (veh)								0	0

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	391	312	149	152	139	70	200	94
Average Queue (ft)	193	62	21	71	47	20	101	43
95th Queue (ft)	347	201	90	137	104	52	174	73
Link Distance (ft)	390	390	390	233	233		558	
Upstream Blk Time (%)	1							
Queuing Penalty (veh)	2							
Storage Bay Dist (ft)						110		285
Storage Blk Time (%)					1	0		
Queuing Penalty (veh)					1	0		

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

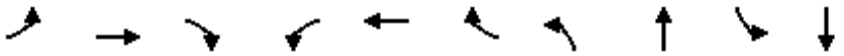
Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	T	R	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	150	167	119	79	4	16	98	101	32	25	109	116
Average Queue (ft)	61	84	30	14	0	1	34	37	6	1	48	50
95th Queue (ft)	124	137	86	50	3	8	78	82	25	10	96	87
Link Distance (ft)			233	233			126	126	135	135	596	596
Upstream Blk Time (%)		0	0				0	0				
Queuing Penalty (veh)		0	0				0	0				
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	1	1	0	0			1					
Queuing Penalty (veh)	1	2	0	0			0					

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	B64	WB	NB	SB	SB
Directions Served	LTR	T		TR	LTR	L	R
Maximum Queue (ft)	111	52	35	4	29	28	76
Average Queue (ft)	25	3	1	0	6	9	33
95th Queue (ft)	76	24	15	3	26	30	58
Link Distance (ft)	83	126	126	617	109	141	141
Upstream Blk Time (%)	0						
Queuing Penalty (veh)	1						
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 11



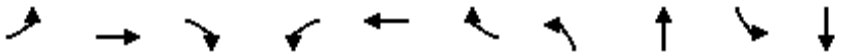
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	178	102	146	198	98	80	305	105	195
v/c Ratio	0.10	0.24	0.24	0.50	0.15	0.15	0.35	0.35	0.42	0.22
Control Delay	36.1	26.4	4.6	33.6	15.9	5.6	34.5	17.0	34.1	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	26.4	4.6	33.6	15.9	5.6	34.5	17.0	34.1	19.6
Queue Length 50th (ft)	6	27	0	46	21	0	26	33	33	26
Queue Length 95th (ft)	32	82	25	145	76	36	93	89	113	68
Internal Link Dist (ft)		595			2562			576		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	431	1420	708	687	1963	905	687	1450	687	1471
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.13	0.14	0.21	0.10	0.11	0.12	0.21	0.15	0.13

Intersection Summary



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	15	26	306	6	388
v/c Ratio	0.11	0.06	0.11	0.11	0.03	0.15
Control Delay	0.5	19.3	23.2	7.9	24.8	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.5	19.3	23.2	7.9	24.8	8.1
Queue Length 50th (ft)	0	1	3	0	1	0
Queue Length 95th (ft)	0	22	37	93	15	118
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	917	843	781	3039	544	2579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.03	0.10	0.01	0.15

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	222	53	134	259	318	69	418	281	480
v/c Ratio	0.35	0.35	0.15	0.59	0.28	0.50	0.44	0.55	0.67	0.35
Control Delay	47.0	34.5	1.7	49.5	28.2	6.2	51.3	32.5	41.1	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	34.5	1.7	49.5	28.2	6.2	51.3	32.5	41.1	20.1
Queue Length 50th (ft)	24	55	0	66	60	0	34	93	127	81
Queue Length 95th (ft)	65	110	5	168	112	63	102	196	#368	196
Internal Link Dist (ft)		2562			594			1877		277
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1371	1523	721	610	1379	796	319	1269	513	1671
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.15	0.07	0.22	0.19	0.40	0.22	0.33	0.55	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	325	633	622	88	280	310	213	86	75	297	275	178
Average Queue (ft)	310	554	494	21	133	147	73	29	19	169	114	54
95th Queue (ft)	382	782	788	62	233	249	154	66	56	286	226	125
Link Distance (ft)		580	580		309	309	309	178		291	291	
Upstream Blk Time (%)		65	11		0	0	0			3	0	
Queuing Penalty (veh)		0	0		0	2	1			7	0	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	15	76			6			32	9		8	0
Queuing Penalty (veh)	73	237			1			6	3		13	1

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	295	404	340	144	143	118	149	400	499
Average Queue (ft)	293	371	108	40	60	58	79	275	439
95th Queue (ft)	304	426	305	100	117	102	130	558	567
Link Distance (ft)		334	334		390	390	390		442
Upstream Blk Time (%)		48	0						70
Queuing Penalty (veh)		324	1						0
Storage Bay Dist (ft)	250			250				175	
Storage Blk Time (%)	88	11	0						82
Queuing Penalty (veh)	300	37	0						69

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	425	403	143	227	222	215	541	362
Average Queue (ft)	409	100	14	119	113	72	351	113
95th Queue (ft)	421	293	79	196	196	158	552	366
Link Distance (ft)	390	390	390	233	233		558	
Upstream Blk Time (%)	21	0	0	0	0	0	5	
Queuing Penalty (veh)	78	1	0	1	0	0	0	
Storage Bay Dist (ft)						110		285
Storage Blk Time (%)					7	1	30	
Queuing Penalty (veh)					22	4	59	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

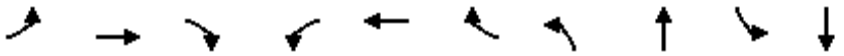
Movement	EB	EB	EB	EB	WB	WB	B64	B64	NB	NB	SB	SB
Directions Served	UL	L	T	T	T	TR	T	T	LT	R	LT	R
Maximum Queue (ft)	186	229	261	152	142	209	16	91	37	21	145	163
Average Queue (ft)	106	124	45	5	53	101	1	7	7	1	57	70
95th Queue (ft)	176	196	164	62	114	189	12	48	27	9	111	124
Link Distance (ft)			233	233	126	126	83	83	135	135	596	596
Upstream Blk Time (%)		1	1	0	0	5	0	1				
Queuing Penalty (veh)		0	3	1	1	17	0	2				
Storage Bay Dist (ft)	130	130										
Storage Blk Time (%)	4	14	1		4							
Queuing Penalty (veh)	8	29	3		0							

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	WB	WB	SB	SB
Directions Served	LTR	T	LT	TR	L	R
Maximum Queue (ft)	142	36	15	34	42	87
Average Queue (ft)	31	1	0	1	9	39
95th Queue (ft)	98	23	6	17	32	69
Link Distance (ft)	83	126	653	653	141	141
Upstream Blk Time (%)	1	0				
Queuing Penalty (veh)	5	0				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 1309



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	252	123	241	469	197	317	570	151	360
v/c Ratio	0.12	0.41	0.32	0.79	0.34	0.27	0.84	0.55	0.65	0.52
Control Delay	49.3	35.5	7.5	55.6	20.8	4.4	55.4	24.8	51.3	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	35.5	7.5	55.6	20.8	4.4	55.4	24.8	51.3	32.2
Queue Length 50th (ft)	6	64	0	120	87	0	157	103	77	82
Queue Length 95th (ft)	24	99	18	222	148	23	#344	167	143	123
Internal Link Dist (ft)		589			2551			534		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	257	901	493	410	1433	743	410	1036	410	899
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.28	0.25	0.59	0.33	0.27	0.77	0.55	0.37	0.40

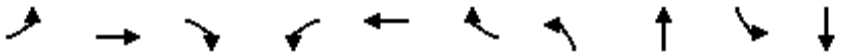
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	215	48	117	546	10	458
v/c Ratio	0.54	0.23	0.45	0.32	0.07	0.40
Control Delay	25.4	26.6	33.0	12.8	35.4	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	26.6	33.0	12.8	35.4	16.0
Queue Length 50th (ft)	56	9	35	55	3	48
Queue Length 95th (ft)	157	51	117	168	22	130
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	580	578	515	2127	358	1696
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.08	0.23	0.26	0.03	0.27

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	284	133	258	449	230	241	834	121	540
v/c Ratio	0.50	0.36	0.31	0.80	0.38	0.35	0.94	0.81	0.63	0.61
Control Delay	57.0	37.1	10.0	61.3	27.4	5.6	91.4	44.9	63.3	39.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	37.1	10.0	61.3	27.4	5.6	91.4	44.9	63.3	39.2
Queue Length 50th (ft)	52	87	5	186	120	5	~201	314	88	186
Queue Length 95th (ft)	93	146	58	298	184	59	#420	#526	161	266
Internal Link Dist (ft)		2551			673			1892		285
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1101	1224	604	490	1368	721	256	1024	412	1350
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.23	0.22	0.53	0.33	0.32	0.94	0.81	0.29	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	325	628	615	185	331	341	224	106	71	387	394	200
Average Queue (ft)	291	539	504	42	223	233	71	39	21	354	355	180
95th Queue (ft)	415	750	740	130	332	339	149	83	57	394	392	267
Link Distance (ft)		574	574		309	309	309	178		283	283	
Upstream Blk Time (%)		53	13		3	4	0	0		89	74	
Queuing Penalty (veh)		0	0		11	17	1	0		459	380	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	8	75			30			42	14		71	8
Queuing Penalty (veh)	42	168			11			8	6		204	30

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	UL	T	T	LT	R
Maximum Queue (ft)	295	448	357	296	267	173	179	400	499
Average Queue (ft)	294	414	170	131	135	57	80	344	453
95th Queue (ft)	296	435	355	254	230	135	157	548	528
Link Distance (ft)		336	336		390	390	390		442
Upstream Blk Time (%)		61	0	0					73
Queuing Penalty (veh)		576	2	0					0
Storage Bay Dist (ft)	250			250				175	
Storage Blk Time (%)	75	12	0	1				3	86
Queuing Penalty (veh)	301	48	1	4				21	139

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	419	419	394	248	255	220	392	134
Average Queue (ft)	403	187	78	168	148	54	214	53
95th Queue (ft)	422	406	272	249	237	160	342	104
Link Distance (ft)	390	390	390	233	233		558	
Upstream Blk Time (%)	32	2	0	2	1	0		
Queuing Penalty (veh)	146	9	0	6	4	0		
Storage Bay Dist (ft)						110		285
Storage Blk Time (%)					17	0	4	
Queuing Penalty (veh)					31	1	8	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	182	232	256	103	20	10	166	191	16	20	38	26
Average Queue (ft)	92	121	86	8	1	0	69	80	1	1	7	3
95th Queue (ft)	166	206	233	79	9	6	135	164	9	12	28	15
Link Distance (ft)			233	233			126	126	83	83	135	135
Upstream Blk Time (%)		1	2	1			1	3				
Queuing Penalty (veh)		0	8	3			3	9				
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	3	10	4				7					
Queuing Penalty (veh)	9	31	12				0					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

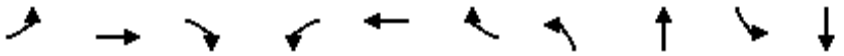
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	222	180
Average Queue (ft)	81	83
95th Queue (ft)	177	141
Link Distance (ft)	596	596
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	B64	WB	WB	NB	SB	SB
Directions Served	LTR	T		LT	TR	LTR	L	R
Maximum Queue (ft)	140	95	9	16	5	38	42	66
Average Queue (ft)	45	7	0	1	0	7	9	31
95th Queue (ft)	121	57	7	7	3	29	32	54
Link Distance (ft)	83	126	126	646	646	109	141	141
Upstream Blk Time (%)	2	0						
Queuing Penalty (veh)	12	1						
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Zone Summary

Zone wide Queuing Penalty: 2723



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	44	398	299	262	321	116	149	460	178	345
v/c Ratio	0.33	0.53	0.53	0.80	0.23	0.17	0.63	0.59	0.69	0.45
Control Delay	49.9	34.3	7.9	54.4	21.4	5.9	49.7	26.5	51.2	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	34.3	7.9	54.4	21.4	5.9	49.7	26.5	51.2	31.3
Queue Length 50th (ft)	22	98	0	128	62	0	75	83	89	80
Queue Length 95th (ft)	70	187	71	#356	134	41	174	166	206	155
Internal Link Dist (ft)		524			2561			556		279
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	270	943	634	430	1411	692	430	983	430	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.42	0.47	0.61	0.23	0.17	0.35	0.47	0.41	0.37

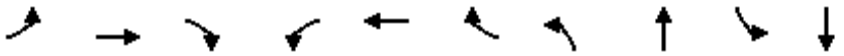
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	150	26	32	396	19	605
v/c Ratio	0.38	0.12	0.15	0.20	0.10	0.34
Control Delay	18.1	21.0	28.5	11.1	29.3	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	21.0	28.5	11.1	29.3	13.5
Queue Length 50th (ft)	15	1	4	17	3	27
Queue Length 95th (ft)	95	30	44	124	32	194
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	722	698	650	2700	453	2157
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.04	0.05	0.15	0.04	0.28

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	175	469	104	208	400	276	104	591	366	690
v/c Ratio	0.58	0.62	0.26	0.75	0.39	0.43	0.63	0.74	0.97	0.55
Control Delay	59.2	45.4	10.9	63.6	33.8	5.8	69.6	44.4	84.6	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	45.4	10.9	63.6	33.8	5.8	69.6	44.4	84.6	32.5
Queue Length 50th (ft)	64	166	4	147	124	0	74	192	270	202
Queue Length 95th (ft)	114	249	52	254	181	61	151	307	#587	344
Internal Link Dist (ft)		2561			657			1869		306
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1011	1123	554	449	1113	673	235	945	378	1259
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.42	0.19	0.46	0.36	0.41	0.44	0.63	0.97	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	UL	LT	R
Maximum Queue (ft)	279	354	286	64	201	214	136	62	42	321	335	200
Average Queue (ft)	155	164	99	21	91	109	62	18	5	279	256	123
95th Queue (ft)	272	403	331	54	163	181	108	48	26	340	367	252
Link Distance (ft)		578	578		309	309	309	178		285	285	
Upstream Blk Time (%)		4	1							46	18	
Queuing Penalty (veh)		0	0							196	78	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	2	12			1			19	2		46	1
Queuing Penalty (veh)	8	28			0			1	0		85	3

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	295	395	346	204	179	102	151	341	461
Average Queue (ft)	263	287	99	64	68	39	86	166	317
95th Queue (ft)	357	479	285	141	137	88	146	437	538
Link Distance (ft)		335	335		390	390	390		442
Upstream Blk Time (%)		23	0						28
Queuing Penalty (veh)		154	1						0
Storage Bay Dist (ft)	250			250				175	
Storage Blk Time (%)	48	5	0	0				0	52
Queuing Penalty (veh)	158	17	0	0				2	50

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	429	378	232	200	213	166	376	89
Average Queue (ft)	376	82	22	108	115	35	191	39
95th Queue (ft)	482	239	123	175	193	107	316	67
Link Distance (ft)	390	390	390	233	233		558	
Upstream Blk Time (%)	13	0	0	0	0	0		
Queuing Penalty (veh)	48	1	0	0	1	0		
Storage Bay Dist (ft)						110		285
Storage Blk Time (%)					8	0	2	
Queuing Penalty (veh)					12	1	4	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

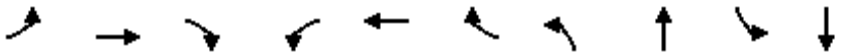
Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	T	R	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	155	169	212	8	3	22	104	134	33	16	131	120
Average Queue (ft)	69	91	38	0	0	1	33	54	7	1	57	58
95th Queue (ft)	131	147	137	6	2	9	77	108	26	10	111	102
Link Distance (ft)			233	233			126	126	135	135	596	596
Upstream Blk Time (%)		0	0				0	0				
Queuing Penalty (veh)		0	0				0	1				
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	1	4	1				1					
Queuing Penalty (veh)	1	8	2				0					

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	NB	SB	SB
Directions Served	LTR	T	LTR	L	R
Maximum Queue (ft)	134	20	29	42	64
Average Queue (ft)	29	1	6	7	35
95th Queue (ft)	86	8	25	28	56
Link Distance (ft)	83	126	109	141	141
Upstream Blk Time (%)	1				
Queuing Penalty (veh)	2				
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 862



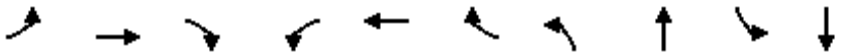
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	17	178	113	146	198	98	90	305	105	195
v/c Ratio	0.10	0.24	0.26	0.50	0.15	0.15	0.38	0.35	0.42	0.22
Control Delay	36.1	26.4	6.1	33.6	15.9	5.6	34.4	17.0	34.1	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	26.4	6.1	33.6	15.9	5.6	34.4	17.0	34.1	20.0
Queue Length 50th (ft)	6	27	0	46	21	0	29	33	33	26
Queue Length 95th (ft)	32	82	32	145	76	36	101	89	113	70
Internal Link Dist (ft)		595			2562			576		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	431	1420	708	687	1963	905	687	1450	687	1465
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.13	0.16	0.21	0.10	0.11	0.13	0.21	0.15	0.13

Intersection Summary



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	59	21	26	338	6	426
v/c Ratio	0.16	0.08	0.11	0.12	0.03	0.16
Control Delay	12.4	20.2	23.6	8.1	25.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	20.2	23.6	8.1	25.2	8.4
Queue Length 50th (ft)	6	2	3	0	1	0
Queue Length 95th (ft)	41	28	37	104	15	132
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	839	845	763	3005	532	2519
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.02	0.03	0.11	0.01	0.17

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	222	53	149	259	318	69	450	281	496
v/c Ratio	0.36	0.36	0.15	0.62	0.27	0.49	0.44	0.58	0.68	0.36
Control Delay	48.3	35.8	1.7	50.6	28.4	6.1	52.8	33.4	42.8	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	35.8	1.7	50.6	28.4	6.1	52.8	33.4	42.8	20.9
Queue Length 50th (ft)	25	57	0	76	62	0	36	104	132	87
Queue Length 95th (ft)	67	113	5	185	113	63	104	214	#376	209
Internal Link Dist (ft)		2562			594			1877		277
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1329	1476	702	591	1346	784	309	1231	497	1622
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.15	0.08	0.25	0.19	0.41	0.22	0.37	0.57	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	306	270	235	116	233	241	151	79	72	120	150	120
Average Queue (ft)	163	89	94	31	114	132	60	28	21	51	64	56
95th Queue (ft)	257	202	184	76	196	214	121	64	58	98	118	102
Link Distance (ft)		502	502		300	300	300	165		691	691	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	5	0			3			30	5		1	1
Queuing Penalty (veh)	23	1			1			6	2		2	1

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	192	244	211	165	168	341	136	153	260	370
Average Queue (ft)	79	110	109	55	47	146	57	61	95	202
95th Queue (ft)	158	192	193	132	111	277	124	134	185	331
Link Distance (ft)		340	340	340		384	384	384		455
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)	0	0							1	16
Queuing Penalty (veh)	0	0							5	31

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	275	315	235	153	239	267	220	393	141
Average Queue (ft)	135	133	68	21	148	130	139	200	66
95th Queue (ft)	239	252	173	93	229	231	235	329	117
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)		0		0	1	1	0		
Queuing Penalty (veh)		0		0	4	5	0		
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						10	13	3	
Queuing Penalty (veh)						50	42	8	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	262	145	124	124	199	221	82	158	176	104
Average Queue (ft)	110	138	152	13	40	53	111	170	5	40	141	29
95th Queue (ft)	187	232	258	88	89	112	185	237	35	129	182	69
Link Distance (ft)			233	233			126	126	83	83	135	135
Upstream Blk Time (%)		1	2	0		0	6	28	0	8	52	0
Queuing Penalty (veh)		0	8	2		0	23	110	1	30	0	0
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	5	10	11		0	6	19					
Queuing Penalty (veh)	9	17	41		0	17	12					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

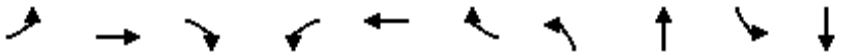
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	138	376
Average Queue (ft)	59	161
95th Queue (ft)	113	287
Link Distance (ft)	579	579
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Road & Alrose Lane

Movement	EB	B64	B64	WB	WB	SB	SB
Directions Served	LTR	T		LT	TR	L	R
Maximum Queue (ft)	164	125	48	87	94	44	115
Average Queue (ft)	50	14	2	7	13	10	47
95th Queue (ft)	143	84	21	45	70	33	95
Link Distance (ft)	83	126	126	646	646	141	141
Upstream Blk Time (%)	4	1					2
Queuing Penalty (veh)	17	2					0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 471



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	287	127	267	540	220	333	606	160	400
v/c Ratio	0.20	0.46	0.33	0.84	0.41	0.31	0.88	0.59	0.68	0.58
Control Delay	50.9	37.2	7.9	61.2	23.7	4.8	62.0	26.8	54.3	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	37.2	7.9	61.2	23.7	4.8	62.0	26.8	54.3	34.0
Queue Length 50th (ft)	11	78	0	142	106	0	182	124	87	98
Queue Length 95th (ft)	34	111	22	#267	173	23	#368	183	150	136
Internal Link Dist (ft)		589			2551			534		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	242	852	474	386	1345	724	386	1033	386	852
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.34	0.27	0.69	0.40	0.30	0.86	0.59	0.41	0.47

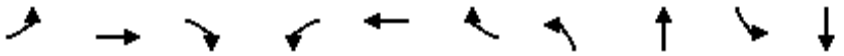
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	234	63	125	579	17	477
v/c Ratio	0.56	0.29	0.48	0.35	0.11	0.43
Control Delay	26.2	26.9	34.7	13.8	36.3	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	26.9	34.7	13.8	36.3	17.3
Queue Length 50th (ft)	66	13	40	64	6	56
Queue Length 95th (ft)	174	62	126	185	31	142
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	565	565	500	2067	349	1651
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.11	0.25	0.28	0.05	0.29

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	144	300	144	256	506	233	256	873	128	566
v/c Ratio	0.51	0.38	0.33	0.80	0.43	0.37	1.01	0.86	0.65	0.64
Control Delay	57.4	37.5	11.3	61.9	28.5	7.5	107.6	48.1	63.7	39.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	37.5	11.3	61.9	28.5	7.5	107.6	48.1	63.7	39.6
Queue Length 50th (ft)	54	93	10	186	139	17	~226	335	94	197
Queue Length 95th (ft)	95	154	67	299	210	78	#453	#567	170	279
Internal Link Dist (ft)		2551			673			1892		285
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1090	1211	601	485	1350	700	254	1013	408	1336
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.25	0.24	0.53	0.37	0.33	1.01	0.86	0.31	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	184	218	245	62	220	248	62	92	78	174	242	200
Average Queue (ft)	75	82	104	17	125	139	25	32	20	101	129	90
95th Queue (ft)	135	174	205	49	204	225	53	72	60	161	204	179
Link Distance (ft)		509	509		306	306	306	166		682	682	
Upstream Blk Time (%)						0						
Queuing Penalty (veh)						0						
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	0	0			5			34	5		20	3
Queuing Penalty (veh)	1	0			1			8	2		47	6

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	UL	T	T	LT	R
Maximum Queue (ft)	181	220	209	168	224	327	135	139	318	359
Average Queue (ft)	75	115	114	63	93	170	39	36	150	146
95th Queue (ft)	149	188	187	131	186	293	101	101	265	271
Link Distance (ft)		340	340	340		384	384	384		455
Upstream Blk Time (%)						0				0
Queuing Penalty (veh)						0				0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)		0			0				10	6
Queuing Penalty (veh)		0			0				43	15

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	286	302	298	265	247	245	173	310	250
Average Queue (ft)	129	138	96	66	163	129	59	131	84
95th Queue (ft)	234	252	240	181	252	214	132	237	194
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)	0	0	1	0	1	0	0		
Queuing Penalty (veh)	0	0	4	0	7	2	0		
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						11	1	0	1
Queuing Penalty (veh)						31	5	0	3

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	282	249	179	118	198	205	58	82	158	57
Average Queue (ft)	132	163	154	122	34	32	110	124	3	9	107	16
95th Queue (ft)	209	247	272	237	115	86	192	213	32	45	169	43
Link Distance (ft)			233	233			126	126	83	83	135	135
Upstream Blk Time (%)		5	6	1		0	7	11	0	1	15	
Queuing Penalty (veh)		0	30	3		0	22	36	0	2	0	
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	11	25	10	8		2	21					
Queuing Penalty (veh)	33	74	39	6		4	7					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

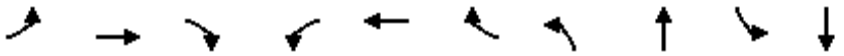
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	311	351
Average Queue (ft)	117	157
95th Queue (ft)	255	269
Link Distance (ft)	579	579
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	B64	WB	WB	NB	SB	SB
Directions Served	LTR	T		LT	TR	LTR	L	R
Maximum Queue (ft)	180	231	182	56	8	52	60	71
Average Queue (ft)	84	81	31	4	0	15	21	38
95th Queue (ft)	180	218	118	27	5	41	50	62
Link Distance (ft)	83	126	126	490	490	109	141	141
Upstream Blk Time (%)	6	4	1					
Queuing Penalty (veh)	43	15	4					
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Zone Summary

Zone wide Queuing Penalty: 496



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	411	300	272	333	122	150	478	178	356
v/c Ratio	0.36	0.54	0.53	0.82	0.24	0.18	0.64	0.61	0.69	0.47
Control Delay	50.6	34.9	8.0	55.8	21.8	5.8	50.4	26.8	51.9	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	34.9	8.0	55.8	21.8	5.8	50.4	26.8	51.9	31.8
Queue Length 50th (ft)	26	105	0	136	65	0	77	89	91	85
Queue Length 95th (ft)	77	193	72	#376	140	43	175	172	206	160
Internal Link Dist (ft)		524			2561			556		279
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	266	929	625	423	1403	693	423	974	423	932
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.44	0.48	0.64	0.24	0.18	0.35	0.49	0.42	0.38

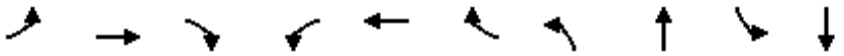
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	162	38	43	419	27	651
v/c Ratio	0.42	0.18	0.20	0.26	0.14	0.42
Control Delay	18.8	21.2	29.6	13.4	30.6	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	21.2	29.6	13.4	30.6	14.8
Queue Length 50th (ft)	19	3	7	21	5	34
Queue Length 95th (ft)	102	38	55	134	40	216
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	660	637	587	2358	409	1950
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.06	0.07	0.18	0.07	0.33

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	179	479	111	237	416	284	111	610	374	732
v/c Ratio	0.59	0.63	0.27	0.80	0.39	0.43	0.67	0.76	1.03	0.60
Control Delay	61.6	47.0	12.3	66.9	33.6	5.5	73.5	47.4	100.8	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	47.0	12.3	66.9	33.6	5.5	73.5	47.4	100.8	35.6
Queue Length 50th (ft)	70	180	9	179	134	0	84	213	~324	236
Queue Length 95th (ft)	118	258	60	290	190	61	162	325	#612	375
Internal Link Dist (ft)		2561			657			1869		306
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	974	1082	538	433	1134	686	227	912	364	1220
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.44	0.21	0.55	0.37	0.41	0.49	0.67	1.03	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	UL	LT	R
Maximum Queue (ft)	139	153	157	54	138	159	58	62	49	98	131	87
Average Queue (ft)	60	42	50	13	48	70	13	24	10	43	55	44
95th Queue (ft)	115	106	117	40	104	130	38	54	36	85	105	77
Link Distance (ft)		506	506		306	306	306	166		690	690	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	0	0			0			26	2		2	0
Queuing Penalty (veh)	0	0			0			4	0		2	0

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	133	168	155	100	86	247	102	96	174	190
Average Queue (ft)	37	68	60	16	21	105	28	29	88	79
95th Queue (ft)	98	130	126	61	59	200	76	78	150	141
Link Distance (ft)		340	340	340		384	384	384		455
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)									0	0
Queuing Penalty (veh)									1	1

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	203	231	205	90	175	140	99	178	122
Average Queue (ft)	97	109	55	8	84	55	28	94	51
95th Queue (ft)	181	193	153	44	153	116	71	162	93
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						1	0		
Queuing Penalty (veh)						2	0		

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

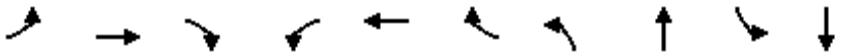
Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	T	R	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	187	227	266	158	74	76	127	151	141	26	276	180
Average Queue (ft)	98	129	114	6	8	29	58	65	67	9	123	81
95th Queue (ft)	180	209	231	61	38	64	110	125	124	29	223	137
Link Distance (ft)			233	233			126	126	135	135	584	584
Upstream Blk Time (%)		0	1	0		0	0	1	2			
Queuing Penalty (veh)		0	5	1		0	0	2	0			
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	4	15	3			1	4					
Queuing Penalty (veh)	6	27	9			1	1					

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	WB	NB	SB	SB
Directions Served	LTR	T	TR	LTR	L	R
Maximum Queue (ft)	134	13	10	34	45	84
Average Queue (ft)	47	0	1	13	14	39
95th Queue (ft)	111	9	5	37	38	65
Link Distance (ft)	83	126	647	109	141	141
Upstream Blk Time (%)	1					
Queuing Penalty (veh)	6					
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 71



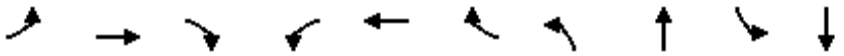
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	186	106	154	207	106	85	324	106	207
v/c Ratio	0.13	0.25	0.25	0.51	0.16	0.16	0.37	0.37	0.42	0.23
Control Delay	36.2	26.7	5.2	33.9	16.0	5.5	34.9	17.0	34.6	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	26.7	5.2	33.9	16.0	5.5	34.9	17.0	34.6	19.8
Queue Length 50th (ft)	7	30	0	50	22	0	28	36	34	28
Queue Length 95th (ft)	37	86	28	152	80	38	97	94	115	73
Internal Link Dist (ft)		595			2562			576		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	426	1405	701	680	1944	901	680	1440	680	1451
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.13	0.15	0.23	0.11	0.12	0.13	0.23	0.16	0.14

Intersection Summary



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	33	38	344	11	436
v/c Ratio	0.14	0.14	0.16	0.14	0.05	0.20
Control Delay	0.7	22.1	26.1	9.6	27.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	22.1	26.1	9.6	27.7	11.8
Queue Length 50th (ft)	0	4	6	11	2	14
Queue Length 95th (ft)	0	39	48	108	22	140
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	836	771	696	2737	485	2299
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.04	0.05	0.13	0.02	0.19

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	232	58	163	274	332	74	452	289	521
v/c Ratio	0.38	0.38	0.17	0.65	0.31	0.53	0.47	0.59	0.68	0.37
Control Delay	49.6	37.1	2.6	52.1	29.7	6.5	54.7	34.9	43.5	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	37.1	2.6	52.1	29.7	6.5	54.7	34.9	43.5	21.8
Queue Length 50th (ft)	27	63	0	87	68	0	40	110	141	96
Queue Length 95th (ft)	71	120	10	202	119	64	110	220	#402	226
Internal Link Dist (ft)		2562			594			1877		277
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1280	1422	680	569	1306	779	298	1188	479	1564
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.16	0.09	0.29	0.21	0.43	0.25	0.38	0.60	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	318	434	313	111	292	300	198	93	66	227	259	199
Average Queue (ft)	188	116	109	35	157	174	88	24	17	107	128	80
95th Queue (ft)	300	290	231	81	256	265	156	60	51	192	223	173
Link Distance (ft)		585	585		306	306	306	166		291	291	
Upstream Blk Time (%)					0	0				0	1	
Queuing Penalty (veh)					1	2				0	1	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	11	0			9			29	4		20	1
Queuing Penalty (veh)	53	1			4			6	1		36	2

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	191	220	255	180	197	291	157	213	400	482
Average Queue (ft)	93	124	119	60	62	125	65	102	224	365
95th Queue (ft)	170	198	204	137	140	230	134	190	480	556
Link Distance (ft)		334	334	334		384	384	384		442
Upstream Blk Time (%)										23
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)		0							1	53
Queuing Penalty (veh)		0							5	101

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	332	355	270	136	243	276	220	548	377
Average Queue (ft)	145	146	74	23	168	174	153	325	141
95th Queue (ft)	292	302	194	92	248	278	253	558	393
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)	0	0			1	2	0	5	
Queuing Penalty (veh)	0	0			7	15	0	0	
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						19	15	24	
Queuing Penalty (veh)						101	53	64	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	274	234	162	124	212	226	136	220	173	108
Average Queue (ft)	122	152	171	30	45	57	123	187	21	101	143	30
95th Queue (ft)	192	241	278	150	102	116	212	238	98	236	180	69
Link Distance (ft)			233	233			126	126	131	131	135	135
Upstream Blk Time (%)		0	3	1		0	10	44	1	18	59	0
Queuing Penalty (veh)		0	15	4		0	42	183	3	75	0	0
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	6	12	14		0	11	24					
Queuing Penalty (veh)	12	23	53		0	34	15					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

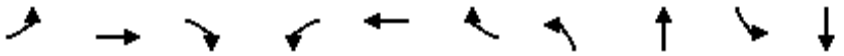
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	177	471
Average Queue (ft)	66	193
95th Queue (ft)	132	365
Link Distance (ft)	581	581
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	B64	B64	WB	WB	SB	SB
Directions Served	L	TR	T		LT	TR	L	R
Maximum Queue (ft)	74	45	20	21	162	254	63	145
Average Queue (ft)	24	3	1	1	9	52	14	64
95th Queue (ft)	62	36	14	15	79	203	47	130
Link Distance (ft)		131	126	126	664	664	136	136
Upstream Blk Time (%)	0	0					0	9
Queuing Penalty (veh)	0	0					0	0
Storage Bay Dist (ft)	75							
Storage Blk Time (%)	2	0						
Queuing Penalty (veh)	7	0						

Zone Summary

Zone wide Queuing Penalty: 921



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	287	135	267	540	220	340	606	160	400
v/c Ratio	0.20	0.46	0.35	0.85	0.41	0.31	0.89	0.58	0.69	0.58
Control Delay	51.0	37.3	9.0	61.7	23.8	4.8	62.5	26.7	54.5	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	37.3	9.0	61.7	23.8	4.8	62.5	26.7	54.5	34.1
Queue Length 50th (ft)	11	78	0	142	106	0	187	124	87	98
Queue Length 95th (ft)	34	111	26	#267	173	23	#377	183	150	136
Internal Link Dist (ft)		589			2551			534		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	241	847	472	384	1338	721	384	1043	384	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.34	0.29	0.70	0.40	0.31	0.89	0.58	0.42	0.47

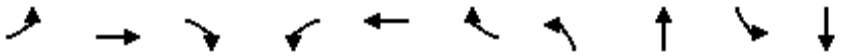
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	239	66	125	597	17	501
v/c Ratio	0.57	0.30	0.48	0.36	0.11	0.45
Control Delay	26.9	27.5	35.1	13.9	36.8	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	27.5	35.1	13.9	36.8	18.1
Queue Length 50th (ft)	69	15	41	67	6	63
Queue Length 95th (ft)	179	64	126	192	31	154
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	560	559	494	2052	344	1629
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.12	0.25	0.29	0.05	0.31

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	144	300	144	266	506	233	256	890	128	576
v/c Ratio	0.52	0.38	0.33	0.81	0.42	0.36	1.02	0.89	0.65	0.65
Control Delay	57.9	38.0	11.4	61.9	28.4	7.5	111.0	50.7	64.1	40.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	38.0	11.4	61.9	28.4	7.5	111.0	50.7	64.1	40.5
Queue Length 50th (ft)	55	95	11	195	140	17	~232	350	95	204
Queue Length 95th (ft)	95	154	67	311	210	78	#453	#583	170	286
Internal Link Dist (ft)		2551			673			1892		285
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1078	1197	595	479	1349	700	251	1003	403	1320
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.25	0.24	0.56	0.38	0.33	1.02	0.89	0.32	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	255	305	364	128	274	281	126	105	76	380	381	200
Average Queue (ft)	124	128	166	35	172	185	54	34	21	310	343	195
95th Queue (ft)	209	237	283	104	259	277	96	75	57	421	402	236
Link Distance (ft)		578	578		306	306	306	166		283	283	
Upstream Blk Time (%)		0	0		0	0				36	59	
Queuing Penalty (veh)		0	0		1	2				187	310	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	1	0			12			38	8		74	9
Queuing Penalty (veh)	7	1			4			9	3		195	35

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	UL	T	T	LT	R
Maximum Queue (ft)	204	224	212	157	276	295	128	168	400	495
Average Queue (ft)	91	125	116	71	136	159	45	64	342	419
95th Queue (ft)	168	191	193	141	239	260	110	144	523	573
Link Distance (ft)		336	336	336		381	381	381		442
Upstream Blk Time (%)										50
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)		0			1				13	77
Queuing Penalty (veh)		0			3				82	215

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	310	332	335	254	258	261	220	317	184
Average Queue (ft)	163	171	106	85	187	172	93	184	78
95th Queue (ft)	260	278	244	204	264	261	213	283	146
Link Distance (ft)	381	381	381	381	233	233		558	
Upstream Blk Time (%)	0	0	0	0	2	1	0		
Queuing Penalty (veh)	0	0	1	0	14	8	0		
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						23	2	1	
Queuing Penalty (veh)						65	6	3	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	286	258	159	124	200	214	89	153	154	63
Average Queue (ft)	133	164	174	134	31	43	118	145	9	24	102	15
95th Queue (ft)	211	253	295	250	113	106	201	234	50	97	169	45
Link Distance (ft)			233	233			126	126	119	119	135	135
Upstream Blk Time (%)		4	5	1		0	10	21	0	1	15	
Queuing Penalty (veh)		0	28	6		0	34	70	0	4	0	
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	11	22	13	11		3	26					
Queuing Penalty (veh)	34	69	55	9		8	9					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

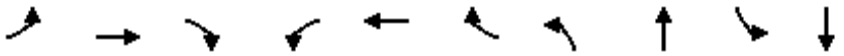
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	252	436
Average Queue (ft)	100	192
95th Queue (ft)	190	363
Link Distance (ft)	581	581
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	B64	B64	WB	WB	NB	SB	SB
Directions Served	L	TR	T		LT	TR	LTR	L	R
Maximum Queue (ft)	87	44	238	157	86	39	48	68	68
Average Queue (ft)	35	3	82	19	5	2	16	21	38
95th Queue (ft)	70	39	229	88	36	21	43	53	62
Link Distance (ft)		119	126	126	642	642	103	137	137
Upstream Blk Time (%)	0	0	2	0					
Queuing Penalty (veh)	0	1	10	1					
Storage Bay Dist (ft)	75								
Storage Blk Time (%)	1	0							
Queuing Penalty (veh)	5	0							

Zone Summary

Zone wide Queuing Penalty: 1495



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	411	307	272	333	122	157	478	178	356
v/c Ratio	0.36	0.54	0.54	0.82	0.24	0.18	0.65	0.61	0.69	0.47
Control Delay	50.6	34.9	7.9	55.8	21.8	5.8	50.8	26.8	51.9	32.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	34.9	7.9	55.8	21.8	5.8	50.8	26.8	51.9	32.1
Queue Length 50th (ft)	26	105	0	136	65	0	81	89	91	85
Queue Length 95th (ft)	77	193	72	#376	140	43	182	172	206	160
Internal Link Dist (ft)		524			2561			556		279
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	266	929	635	423	1403	693	423	974	423	929
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.44	0.48	0.64	0.24	0.18	0.37	0.49	0.42	0.38

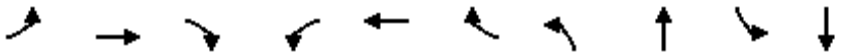
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	168	41	43	439	27	673
v/c Ratio	0.43	0.19	0.21	0.28	0.14	0.44
Control Delay	19.3	21.8	29.9	13.6	31.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	21.8	29.9	13.6	31.1	15.1
Queue Length 50th (ft)	21	3	7	23	5	37
Queue Length 95th (ft)	108	41	55	142	40	226
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	654	637	581	2338	405	1933
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.06	0.07	0.19	0.07	0.35

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	179	479	111	246	416	284	111	630	374	741
v/c Ratio	0.59	0.63	0.27	0.81	0.38	0.42	0.67	0.78	1.04	0.61
Control Delay	62.3	47.6	12.4	68.4	33.6	5.5	74.5	48.3	105.0	36.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	47.6	12.4	68.4	33.6	5.5	74.5	48.3	105.0	36.2
Queue Length 50th (ft)	71	183	9	189	135	0	86	224	~333	244
Queue Length 95th (ft)	118	258	60	300	190	61	162	337	#612	381
Internal Link Dist (ft)		2561			657			1869		306
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	961	1068	532	427	1137	687	224	901	359	1214
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.45	0.21	0.58	0.37	0.41	0.50	0.70	1.04	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	UL	LT	R
Maximum Queue (ft)	233	243	198	111	214	219	128	66	58	368	372	200
Average Queue (ft)	122	78	89	33	108	122	62	21	11	245	283	157
95th Queue (ft)	194	166	165	81	181	194	104	53	40	396	422	272
Link Distance (ft)		586	586		306	306	306	166		281	281	
Upstream Blk Time (%)										19	30	
Queuing Penalty (veh)										81	128	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	1	0			3			26	3		62	1
Queuing Penalty (veh)	3	0			1			4	1		109	3

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	219	248	229	194	204	238	153	197	287	407
Average Queue (ft)	97	124	113	45	76	107	41	75	95	202
95th Queue (ft)	182	211	204	132	160	200	105	160	214	355
Link Distance (ft)		335	335	335		384	384	384		442
Upstream Blk Time (%)										1
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)	0	0		0	0				1	16
Queuing Penalty (veh)	0	0		0	0				6	26

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	369	382	257	128	226	238	137	347	143
Average Queue (ft)	179	193	79	14	116	116	35	174	54
95th Queue (ft)	311	334	197	74	197	200	95	298	100
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)	0	0			0	0	0		
Queuing Penalty (veh)	0	1			1	2	0		
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						10	0	1	
Queuing Penalty (veh)						22	1	3	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	NB	NB	SB
Directions Served	L	L	T	T	R	L	T	TR	T	LT	R	LT
Maximum Queue (ft)	186	226	261	83	30	89	128	192	57	134	26	220
Average Queue (ft)	101	124	115	4	7	28	54	91	2	58	9	111
95th Queue (ft)	172	198	243	38	25	63	109	166	23	104	30	194
Link Distance (ft)			233	233			126	126	83	135	135	581
Upstream Blk Time (%)		0	1	0		0	0	3	0	1		
Queuing Penalty (veh)		0	3	0		0	1	9	0	0		
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	4	9	4			1	4					
Queuing Penalty (veh)	9	19	14			1	1					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

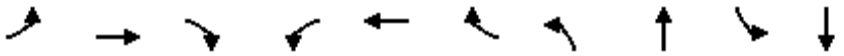
Movement	SB
Directions Served	R
Maximum Queue (ft)	183
Average Queue (ft)	85
95th Queue (ft)	143
Link Distance (ft)	581
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	WB	NB	SB	SB
Directions Served	LTR	T	TR	LTR	L	R
Maximum Queue (ft)	150	80	11	37	59	82
Average Queue (ft)	56	4	0	10	14	39
95th Queue (ft)	133	38	5	34	43	63
Link Distance (ft)	83	126	630	109	141	141
Upstream Blk Time (%)	2	0				
Queuing Penalty (veh)	13	0				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 464



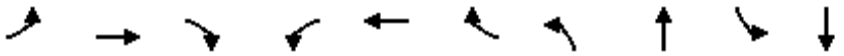
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	186	117	154	207	106	96	324	106	207
v/c Ratio	0.13	0.25	0.27	0.51	0.16	0.16	0.40	0.37	0.42	0.24
Control Delay	36.3	26.8	6.6	33.9	16.0	5.5	34.9	17.0	34.6	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	26.8	6.6	33.9	16.0	5.5	34.9	17.0	34.6	20.2
Queue Length 50th (ft)	7	30	0	50	22	0	31	36	34	28
Queue Length 95th (ft)	37	86	36	152	80	38	107	94	115	74
Internal Link Dist (ft)		595			2562			576		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	426	1405	701	680	1944	901	680	1440	680	1445
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.13	0.17	0.23	0.11	0.12	0.14	0.23	0.16	0.14

Intersection Summary



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	38	38	376	11	473
v/c Ratio	0.20	0.15	0.17	0.16	0.06	0.22
Control Delay	15.0	22.8	26.9	10.1	28.5	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	22.8	26.9	10.1	28.5	12.4
Queue Length 50th (ft)	8	4	6	14	2	17
Queue Length 95th (ft)	47	43	49	119	22	153
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	758	764	684	2698	477	2259
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.05	0.06	0.14	0.02	0.21

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	232	58	179	274	332	74	484	289	537
v/c Ratio	0.39	0.39	0.17	0.68	0.31	0.52	0.48	0.62	0.70	0.38
Control Delay	51.2	38.6	2.7	53.4	30.0	6.4	56.5	35.8	45.5	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	38.6	2.7	53.4	30.0	6.4	56.5	35.8	45.5	22.6
Queue Length 50th (ft)	29	65	0	99	70	0	42	123	147	105
Queue Length 95th (ft)	72	123	9	221	120	63	112	240	#414	240
Internal Link Dist (ft)		2562			594			1877		277
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1242	1380	662	553	1277	770	289	1153	465	1520
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.17	0.09	0.32	0.21	0.43	0.26	0.42	0.62	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	290	317	243	168	264	275	159	129	78	108	143	149
Average Queue (ft)	164	105	116	34	142	157	76	42	26	54	62	68
95th Queue (ft)	256	221	208	90	229	245	136	91	68	101	113	120
Link Distance (ft)		502	502		300	300	300	165		691	691	
Upstream Blk Time (%)					0	0		0				
Queuing Penalty (veh)					0	0		0				
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	6	0			6			41	7		1	2
Queuing Penalty (veh)	32	1			3			10	4		2	2

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	175	222	221	152	168	279	166	201	400	512
Average Queue (ft)	74	114	110	59	59	125	79	77	385	480
95th Queue (ft)	148	192	184	128	131	236	141	151	492	506
Link Distance (ft)		340	340	340		384	384	384		455
Upstream Blk Time (%)										65
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)		0							5	74
Queuing Penalty (veh)		0							32	178

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	276	274	314	221	243	282	220	585	508
Average Queue (ft)	120	117	73	44	156	162	155	440	303
95th Queue (ft)	234	241	226	152	237	279	252	699	645
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)			0	0	1	3	0	29	
Queuing Penalty (veh)			0	0	7	16	0	0	
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						13	18	45	1
Queuing Penalty (veh)						73	58	140	3

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	282	235	173	124	213	229	132	181	173	96
Average Queue (ft)	149	171	149	96	46	61	135	191	24	113	140	32
95th Queue (ft)	220	253	277	195	109	125	220	245	91	206	182	70
Link Distance (ft)			233	233			126	126	84	84	135	135
Upstream Blk Time (%)		6	6	1		0	13	52	2	31	52	0
Queuing Penalty (veh)		0	33	6		0	60	230	8	138	0	0
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	18	26	6	5	0	9	28					
Queuing Penalty (veh)	38	56	28	8	0	29	18					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

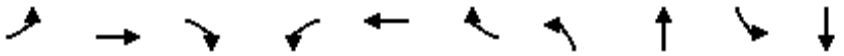
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	317	360
Average Queue (ft)	121	163
95th Queue (ft)	236	288
Link Distance (ft)	583	583
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	B64	B64	WB	WB	SB	SB
Directions Served	L	TR	T		LT	TR	L	R
Maximum Queue (ft)	59	112	189	156	317	434	107	170
Average Queue (ft)	28	8	39	21	32	109	25	93
95th Queue (ft)	60	58	137	98	206	349	90	177
Link Distance (ft)		84	126	126	642	642	137	137
Upstream Blk Time (%)		2	2	2	1	2	3	30
Queuing Penalty (veh)		13	7	5	0	0	0	0
Storage Bay Dist (ft)	75							
Storage Blk Time (%)	0	2						
Queuing Penalty (veh)	3	1						

Zone Summary

Zone wide Queuing Penalty: 1244



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	261	130	228	467	196	304	511	158	359
v/c Ratio	0.23	0.41	0.34	0.77	0.36	0.29	0.83	0.51	0.65	0.52
Control Delay	49.2	34.9	8.4	54.4	23.0	5.1	54.8	23.0	50.5	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	34.9	8.4	54.4	23.0	5.1	54.8	23.0	50.5	31.5
Queue Length 50th (ft)	14	65	0	113	86	0	146	84	79	81
Queue Length 95th (ft)	50	125	45	#296	188	51	#435	188	184	153
Internal Link Dist (ft)		589			2551			534		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	264	925	503	421	1352	712	421	1033	421	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.28	0.26	0.54	0.35	0.28	0.72	0.49	0.38	0.39

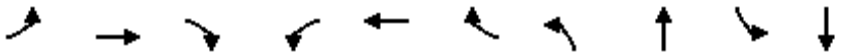
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	294	76	130	679	22	554
v/c Ratio	0.62	0.36	0.53	0.48	0.15	0.55
Control Delay	29.8	28.9	38.6	18.1	37.9	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	28.9	38.6	18.1	37.9	22.0
Queue Length 50th (ft)	97	18	48	87	8	84
Queue Length 95th (ft)	237	73	135	232	38	190
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	510	508	445	1829	310	1476
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.15	0.29	0.37	0.07	0.38

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	304	174	277	554	250	304	978	141	636
v/c Ratio	0.54	0.39	0.39	0.81	0.46	0.39	1.24	0.99	0.67	0.70
Control Delay	59.1	39.4	11.7	63.1	29.8	9.2	179.6	68.3	65.5	42.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	39.4	11.7	63.1	29.8	9.2	179.6	68.3	65.5	42.6
Queue Length 50th (ft)	60	101	14	210	162	29	~322	~450	108	236
Queue Length 95th (ft)	101	159	78	#331	238	99	#558	#683	184	321
Internal Link Dist (ft)		2551			673			1892		285
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1052	1168	601	468	1327	689	245	985	393	1293
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.26	0.29	0.59	0.42	0.36	1.24	0.99	0.36	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	212	280	355	140	309	298	103	121	78	281	344	200
Average Queue (ft)	102	134	169	34	167	173	44	46	33	133	167	135
95th Queue (ft)	174	236	295	95	272	274	83	95	73	217	276	227
Link Distance (ft)		509	509		306	306	306	166		682	682	
Upstream Blk Time (%)					0	0		0				
Queuing Penalty (veh)					2	2		0				
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	1	1			11			44	14		29	12
Queuing Penalty (veh)	4	2			4			18	7		90	31

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	UL	T	T	LT	R
Maximum Queue (ft)	216	249	250	240	285	326	162	160	368	439
Average Queue (ft)	91	129	129	82	135	191	53	51	213	253
95th Queue (ft)	188	227	230	188	259	324	129	131	389	470
Link Distance (ft)		340	340	340		384	384	384		455
Upstream Blk Time (%)		1	1	0	0	0				11
Queuing Penalty (veh)		6	6	0	0	1				0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)	0	2		0	2				21	31
Queuing Penalty (veh)	0	6		0	5				107	88

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	345	359	337	281	255	265	220	392	339
Average Queue (ft)	161	177	152	111	202	172	104	178	131
95th Queue (ft)	290	340	350	279	264	268	214	313	270
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)	0	2	4	0	4	2	0	0	
Queuing Penalty (veh)	0	6	16	0	27	10	0	0	
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						21	4	0	3
Queuing Penalty (veh)						79	18	1	10

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	297	255	180	124	213	225	192	230	158	66
Average Queue (ft)	161	194	216	170	56	51	170	193	64	127	108	16
95th Queue (ft)	224	271	317	276	170	126	238	241	176	254	179	45
Link Distance (ft)			233	233			126	126	130	130	135	135
Upstream Blk Time (%)		10	15	3		0	36	57	7	29	19	
Queuing Penalty (veh)		0	90	19		0	144	229	27	114	0	
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	24	36	23	19	0	5	51					
Queuing Penalty (veh)	79	122	109	15	0	13	18					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

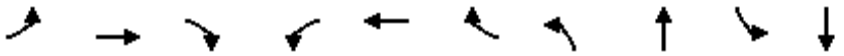
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	456	567
Average Queue (ft)	151	292
95th Queue (ft)	327	537
Link Distance (ft)	577	577
Upstream Blk Time (%)	0	2
Queuing Penalty (veh)	0	9
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	B64	B64	WB	WB	NB	SB	SB
Directions Served	L	TR	T		LT	TR	LTR	L	R
Maximum Queue (ft)	108	163	230	197	259	357	66	91	152
Average Queue (ft)	41	16	114	41	28	72	19	33	73
95th Queue (ft)	84	101	263	140	154	248	52	104	152
Link Distance (ft)		130	126	126	625	625	104	136	136
Upstream Blk Time (%)	0	1	5	1				9	21
Queuing Penalty (veh)	0	9	24	6				0	0
Storage Bay Dist (ft)	100								
Storage Blk Time (%)	1	1							
Queuing Penalty (veh)	8	1							

Zone Summary

Zone wide Queuing Penalty: 1583



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	587	337	293	457	141	174	577	234	489
v/c Ratio	0.42	0.76	0.57	0.89	0.35	0.21	0.72	0.74	0.82	0.58
Control Delay	55.2	43.4	9.0	68.8	25.7	5.7	58.2	36.3	62.7	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	43.4	9.0	68.8	25.7	5.7	58.2	36.3	62.7	35.5
Queue Length 50th (ft)	32	183	7	174	110	0	103	148	138	136
Queue Length 95th (ft)	81	280	88	#414	192	45	201	236	#305	224
Internal Link Dist (ft)		524			2561			556		279
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	231	815	603	368	1293	660	368	847	368	880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.72	0.56	0.80	0.35	0.21	0.47	0.68	0.64	0.56

Intersection Summary

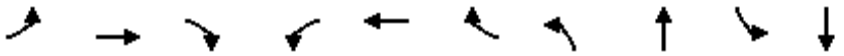
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	226	60	59	630	27	881
v/c Ratio	0.57	0.30	0.32	0.38	0.18	0.60
Control Delay	26.2	28.1	36.4	15.6	37.2	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	28.1	36.4	15.6	37.2	20.8
Queue Length 50th (ft)	72	15	23	71	11	151
Queue Length 95th (ft)	155	59	70	213	41	#361
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	533	516	461	1912	321	1574
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.12	0.13	0.33	0.08	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	526	179	268	416	305	153	779	384	879
v/c Ratio	0.66	0.68	0.43	0.85	0.38	0.44	0.81	0.93	1.14	0.77
Control Delay	65.7	50.4	23.4	74.0	34.7	5.5	86.9	63.4	138.9	44.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	50.4	23.4	74.0	34.7	5.5	86.9	63.4	138.9	44.0
Queue Length 50th (ft)	88	211	56	216	138	0	125	326	~382	346
Queue Length 95th (ft)	135	285	132	#330	193	65	#252	#504	#632	#475
Internal Link Dist (ft)		2561			657			1869		306
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	898	998	503	399	1132	700	209	841	336	1148
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.53	0.36	0.67	0.37	0.44	0.73	0.93	1.14	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	UL	LT	R
Maximum Queue (ft)	209	155	147	59	133	160	90	58	47	124	132	119
Average Queue (ft)	95	58	55	16	58	80	29	23	15	60	66	54
95th Queue (ft)	169	122	123	43	119	141	64	51	41	105	118	97
Link Distance (ft)		506	506		306	306	306	166		690	690	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	0				0			29	3		3	1
Queuing Penalty (veh)	2				0			6	1		5	1

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	166	199	167	123	152	301	121	139	150	223
Average Queue (ft)	48	89	76	32	34	130	29	32	86	99
95th Queue (ft)	121	160	147	90	93	242	85	92	139	171
Link Distance (ft)		340	340	340		384	384	384		455
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)		0							0	1
Queuing Penalty (veh)		0							0	2

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	253	290	199	124	210	213	160	224	127
Average Queue (ft)	123	132	48	24	111	86	51	115	62
95th Queue (ft)	216	229	127	76	191	169	118	193	109
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)					0	0	0		
Queuing Penalty (veh)					0	0	0		
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						4	1	0	
Queuing Penalty (veh)						13	4	0	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	228	246	182	28	82	167	197	8	51	117	26
Average Queue (ft)	118	143	90	50	4	19	73	99	0	3	45	8
95th Queue (ft)	200	222	207	138	18	52	143	178	6	29	90	28
Link Distance (ft)			233	233			126	126	83	83	135	135
Upstream Blk Time (%)		1	1	0		0	2	4		0	0	
Queuing Penalty (veh)		0	3	0		0	5	13		0	0	
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	4	16	2	1		0	8					
Queuing Penalty (veh)	9	32	6	0		0	2					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

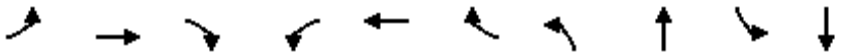
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	285	203
Average Queue (ft)	121	100
95th Queue (ft)	227	175
Link Distance (ft)	584	584
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	B64	WB	NB	SB	SB
Directions Served	LTR	T		TR	LTR	L	R
Maximum Queue (ft)	152	131	71	13	57	45	81
Average Queue (ft)	46	14	7	0	16	12	36
95th Queue (ft)	116	67	39	7	44	37	62
Link Distance (ft)	83	126	126	642	109	141	141
Upstream Blk Time (%)	2	0	0				
Queuing Penalty (veh)	8	0	0				
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Zone Summary

Zone wide Queuing Penalty: 112



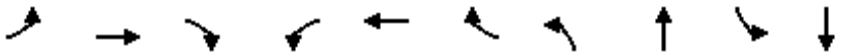
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	271	122	170	293	122	101	394	144	282
v/c Ratio	0.16	0.41	0.31	0.61	0.23	0.19	0.48	0.49	0.57	0.28
Control Delay	41.1	30.6	7.7	40.0	19.3	6.0	40.9	23.0	40.3	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	30.6	7.7	40.0	19.3	6.0	40.9	23.0	40.3	22.2
Queue Length 50th (ft)	8	51	0	64	37	0	38	60	54	46
Queue Length 95th (ft)	39	128	41	174	115	41	116	137	152	105
Internal Link Dist (ft)		595			2562			576		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	323	1063	559	514	1516	735	514	1114	514	1134
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.25	0.22	0.33	0.19	0.17	0.20	0.35	0.28	0.25

Intersection Summary



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	59	48	516	11	597
v/c Ratio	0.20	0.24	0.22	0.25	0.06	0.32
Control Delay	1.2	24.9	28.6	11.4	30.2	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.2	24.9	28.6	11.4	30.2	14.3
Queue Length 50th (ft)	0	10	10	38	2	44
Queue Length 95th (ft)	2	62	59	167	22	205
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	757	690	615	2438	429	2035
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.09	0.08	0.21	0.03	0.29

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	253	95	184	274	353	105	579	300	626
v/c Ratio	0.45	0.43	0.28	0.71	0.31	0.55	0.61	0.68	0.72	0.46
Control Delay	54.0	41.4	9.9	57.9	32.3	6.6	62.3	39.4	49.0	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	41.4	9.9	57.9	32.3	6.6	62.3	39.4	49.0	25.3
Queue Length 50th (ft)	36	77	0	111	76	0	64	164	171	137
Queue Length 95th (ft)	81	133	43	226	121	66	150	302	#437	290
Internal Link Dist (ft)		2562			594			1877		277
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1137	1263	614	506	1175	749	265	1060	425	1402
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.20	0.15	0.36	0.23	0.47	0.40	0.55	0.71	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	318	426	402	214	305	316	239	129	77	254	219	197
Average Queue (ft)	208	136	165	44	176	193	100	41	23	147	103	77
95th Queue (ft)	314	322	316	121	268	285	190	93	61	233	189	159
Link Distance (ft)		578	578		306	306	306	166		291	291	
Upstream Blk Time (%)		0	0		0	0	0	0		1	0	
Queuing Penalty (veh)		0	0		1	2	1	0		1	0	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	12	0		0	14			40	5		9	3
Queuing Penalty (veh)	70	1		0	7			10	3		18	5

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	230	282	277	231	200	248	146	171	400	501
Average Queue (ft)	84	119	135	62	65	109	61	90	394	469
95th Queue (ft)	168	216	235	164	145	208	126	153	462	491
Link Distance (ft)		334	334	334		384	384	384		442
Upstream Blk Time (%)		0	0	0						72
Queuing Penalty (veh)		0	1	0						0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)	0	0		0	0				4	80
Queuing Penalty (veh)	0	1		0	0				31	192

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	320	336	385	352	248	280	220	612	510
Average Queue (ft)	140	140	161	89	164	183	167	580	504
95th Queue (ft)	281	301	382	296	246	300	255	598	585
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)	0	0	3	1	1	4	0	67	
Queuing Penalty (veh)	0	0	11	3	8	26	0	0	
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						16	20	78	1
Queuing Penalty (veh)						92	71	241	8

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	299	260	169	124	225	229	223	240	169	85
Average Queue (ft)	152	191	217	54	47	57	153	199	59	193	143	32
95th Queue (ft)	224	277	319	212	114	125	233	220	176	273	178	74
Link Distance (ft)			233	233			126	126	126	126	135	135
Upstream Blk Time (%)		6	12	3		0	22	69	4	59	66	
Queuing Penalty (veh)		0	66	17		0	103	319	20	274	0	
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	21	26	20	0	0	7	35					
Queuing Penalty (veh)	48	61	101	0	1	25	23					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

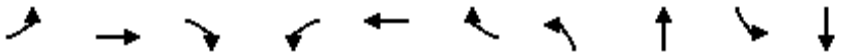
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	294	482
Average Queue (ft)	120	208
95th Queue (ft)	233	386
Link Distance (ft)	582	582
Upstream Blk Time (%)		1
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	B64	WB	WB	SB	SB
Directions Served	L	TR	T	LT	TR	L	R
Maximum Queue (ft)	94	118	77	408	424	148	170
Average Queue (ft)	38	17	8	147	262	27	133
95th Queue (ft)	86	101	71	422	492	100	191
Link Distance (ft)		126	126	390	390	138	138
Upstream Blk Time (%)	1	3	2	5	14	9	81
Queuing Penalty (veh)	0	21	7	0	0	0	0
Storage Bay Dist (ft)	100						
Storage Blk Time (%)	3	2					
Queuing Penalty (veh)	18	1					

Zone Summary

Zone wide Queuing Penalty: 1913



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	261	137	228	467	196	310	511	158	359
v/c Ratio	0.23	0.41	0.35	0.78	0.37	0.29	0.83	0.50	0.66	0.52
Control Delay	49.2	35.0	9.1	54.9	23.1	5.1	54.5	22.9	50.7	31.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	35.0	9.1	54.9	23.1	5.1	54.5	22.9	50.7	31.7
Queue Length 50th (ft)	14	65	0	113	86	0	150	84	79	81
Queue Length 95th (ft)	50	125	51	#296	188	51	#444	188	184	153
Internal Link Dist (ft)		589			2551			534		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	262	918	501	418	1342	708	418	1035	418	915
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.28	0.27	0.55	0.35	0.28	0.74	0.49	0.38	0.39

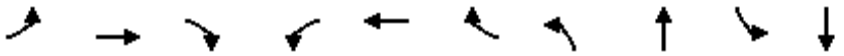
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	299	79	130	697	22	577
v/c Ratio	0.63	0.37	0.53	0.50	0.15	0.57
Control Delay	30.4	30.2	39.1	18.4	38.4	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	30.2	39.1	18.4	38.4	22.7
Queue Length 50th (ft)	102	20	49	91	8	92
Queue Length 95th (ft)	242	77	136	241	38	202
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	504	501	439	1808	306	1456
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.16	0.30	0.39	0.07	0.40

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	304	174	287	554	250	304	996	141	646
v/c Ratio	0.54	0.40	0.39	0.82	0.45	0.39	1.25	1.02	0.68	0.72
Control Delay	59.6	39.8	11.8	63.2	29.5	9.1	184.1	75.1	66.2	43.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.6	39.8	11.8	63.2	29.5	9.1	184.1	75.1	66.2	43.6
Queue Length 50th (ft)	61	102	14	219	162	29	~327	~476	109	245
Queue Length 95th (ft)	101	159	78	#362	238	99	#558	#700	184	326
Internal Link Dist (ft)		2551			673			1892		285
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1043	1158	597	463	1328	690	243	976	390	1282
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.26	0.29	0.62	0.42	0.36	1.25	1.02	0.36	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	L	LT	R
Maximum Queue (ft)	270	430	438	214	328	334	274	120	78	312	336	200
Average Queue (ft)	146	187	247	63	219	226	79	43	34	291	297	196
95th Queue (ft)	231	343	386	173	326	332	167	94	74	302	320	234
Link Distance (ft)		564	564		306	306	306	166		283	283	
Upstream Blk Time (%)		0			2	3	0	0		59	55	
Queuing Penalty (veh)		0			11	15	1	0		364	342	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	2	3		0	26			41	17		73	13
Queuing Penalty (veh)	11	8		0	13			16	9		253	63

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	UL	T	T	LT	R
Maximum Queue (ft)	196	223	203	259	296	311	158	184	400	492
Average Queue (ft)	100	128	112	90	174	189	59	86	400	467
95th Queue (ft)	170	196	187	186	291	310	123	158	401	486
Link Distance (ft)		336	336	336		384	384	384		442
Upstream Blk Time (%)				0	0	1				75
Queuing Penalty (veh)				1	0	2				0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)		0		0	3				19	87
Queuing Penalty (veh)		0		1	10				131	248

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	312	340	313	271	259	254	220	551	446
Average Queue (ft)	169	177	128	94	213	206	146	383	231
95th Queue (ft)	279	298	263	212	273	280	260	639	558
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)	0	0	0	0	7	5	0	17	
Queuing Penalty (veh)	0	0	1	0	44	31	0	0	
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						33	6	37	1
Queuing Penalty (veh)						124	27	110	3

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	UL	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	291	268	180	124	208	231	246	281	170	52
Average Queue (ft)	152	189	204	179	52	36	180	200	115	224	112	16
95th Queue (ft)	222	264	298	272	164	103	241	215	263	284	175	41
Link Distance (ft)			233	233			126	126	174	174	135	135
Upstream Blk Time (%)		7	9	4		0	48	81	14	67	19	
Queuing Penalty (veh)		0	55	24		0	200	339	59	278	0	
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	17	28	22	20		3	59					
Queuing Penalty (veh)	60	99	112	16		9	21					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

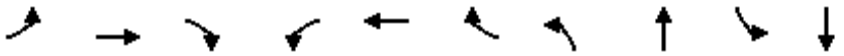
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	537	606
Average Queue (ft)	152	386
95th Queue (ft)	365	645
Link Distance (ft)	580	580
Upstream Blk Time (%)	1	4
Queuing Penalty (veh)	3	20
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	B64	B64	WB	WB	NB	SB	SB
Directions Served	L	TR	T		LT	TR	LTR	L	R
Maximum Queue (ft)	132	206	230	192	653	673	118	132	160
Average Queue (ft)	57	18	126	48	414	483	72	18	131
95th Queue (ft)	118	117	271	158	864	852	138	84	174
Link Distance (ft)		174	126	126	648	648	104	137	137
Upstream Blk Time (%)		1	6	1	23	35	52	3	89
Queuing Penalty (veh)		5	28	5	0	0	0	0	0
Storage Bay Dist (ft)	100								
Storage Blk Time (%)	10	0							
Queuing Penalty (veh)	81	0							

Zone Summary

Zone wide Queuing Penalty: 3255



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	587	343	293	457	141	180	577	234	489
v/c Ratio	0.42	0.76	0.57	0.89	0.35	0.21	0.73	0.74	0.82	0.59
Control Delay	55.2	43.4	9.0	68.8	25.7	5.7	58.6	36.3	62.7	35.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	43.4	9.0	68.8	25.7	5.7	58.6	36.3	62.7	35.9
Queue Length 50th (ft)	32	183	6	174	110	0	107	148	138	137
Queue Length 95th (ft)	81	280	88	#414	192	45	208	236	#305	224
Internal Link Dist (ft)		524			2561			556		279
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	231	815	612	368	1293	660	368	847	368	873
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.72	0.56	0.80	0.35	0.21	0.49	0.68	0.64	0.56

Intersection Summary

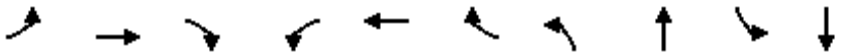
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	233	63	59	649	27	905
v/c Ratio	0.58	0.32	0.32	0.39	0.18	0.61
Control Delay	26.9	28.6	36.8	15.9	37.4	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	28.6	36.8	15.9	37.4	21.3
Queue Length 50th (ft)	76	16	23	75	11	160
Queue Length 95th (ft)	162	62	71	221	41	#378
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	523	508	452	1875	315	1545
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.12	0.13	0.35	0.09	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	526	179	278	416	305	153	798	384	889
v/c Ratio	0.66	0.68	0.43	0.86	0.37	0.44	0.82	0.96	1.15	0.78
Control Delay	66.1	50.7	23.5	75.1	34.5	5.5	88.1	68.4	142.3	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	50.7	23.5	75.1	34.5	5.5	88.1	68.4	142.3	45.0
Queue Length 50th (ft)	90	213	57	226	138	0	127	342	~390	359
Queue Length 95th (ft)	135	285	132	#360	193	65	#252	#522	#632	#500
Internal Link Dist (ft)		2561			657			1869		306
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	892	991	501	396	1141	703	208	835	333	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.53	0.36	0.70	0.36	0.43	0.74	0.96	1.15	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	T	R	LT	R	UL	LT	R
Maximum Queue (ft)	275	275	238	112	237	241	177	70	60	379	377	200
Average Queue (ft)	147	100	103	32	134	137	83	24	19	268	315	171
95th Queue (ft)	233	209	197	76	214	216	143	57	51	402	426	264
Link Distance (ft)		573	573		306	306	306	166		281	281	
Upstream Blk Time (%)					0					21	41	
Queuing Penalty (veh)					0					101	193	
Storage Bay Dist (ft)	200			140					30			110
Storage Blk Time (%)	3	0		0	6			24	5		67	3
Queuing Penalty (veh)	10	0		1	2			5	2		147	10

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	LT	R
Maximum Queue (ft)	239	281	276	203	207	228	157	219	400	491
Average Queue (ft)	121	151	146	66	92	95	59	88	251	377
95th Queue (ft)	207	243	238	163	180	173	127	170	520	586
Link Distance (ft)		337	337	337		384	384	384		455
Upstream Blk Time (%)		0								35
Queuing Penalty (veh)		0								0
Storage Bay Dist (ft)	250				250				175	
Storage Blk Time (%)	0	0		0					0	55
Queuing Penalty (veh)	0	1		0					1	94

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	401	401	302	168	248	248	218	425	246
Average Queue (ft)	192	202	73	15	144	139	79	213	72
95th Queue (ft)	357	374	209	90	227	238	187	367	162
Link Distance (ft)	384	384	384	384	233	233		558	
Upstream Blk Time (%)	0	0	0	0	1	0	0	0	
Queuing Penalty (veh)	1	1	1	0	3	2	0	0	
Storage Bay Dist (ft)							110		285
Storage Blk Time (%)						17	2	6	
Queuing Penalty (veh)						51	6	15	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B64	B64	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	T	T	LT	R
Maximum Queue (ft)	187	232	295	109	56	109	157	207	22	110	101	31
Average Queue (ft)	121	151	133	10	5	22	80	128	1	12	43	7
95th Queue (ft)	198	238	283	69	32	63	145	213	12	63	92	26
Link Distance (ft)			233	233			126	126	83	83	135	135
Upstream Blk Time (%)		1	3	0		0	2	10	0	1	1	
Queuing Penalty (veh)		0	11	0		0	5	34	0	3	0	
Storage Bay Dist (ft)	130	130			115	75						
Storage Blk Time (%)	6	18	6			0	10					
Queuing Penalty (veh)	15	43	22			0	2					

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

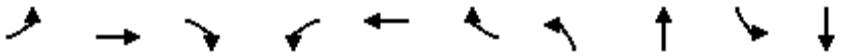
Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	284	240
Average Queue (ft)	130	126
95th Queue (ft)	231	208
Link Distance (ft)	580	580
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	B64	WB	NB	SB	SB
Directions Served	LTR	T	TR	LTR	L	R
Maximum Queue (ft)	161	133	19	60	53	81
Average Queue (ft)	63	8	1	16	13	38
95th Queue (ft)	148	56	10	45	41	67
Link Distance (ft)	83	126	626	109	141	141
Upstream Blk Time (%)	4	0				
Queuing Penalty (veh)	22	1				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Zone Summary

Zone wide Queuing Penalty: 806

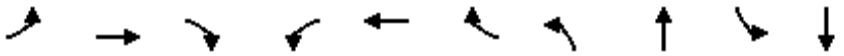


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	271	133	170	293	122	112	394	144	282
v/c Ratio	0.16	0.41	0.33	0.61	0.23	0.19	0.50	0.49	0.57	0.29
Control Delay	41.1	30.6	8.9	40.0	19.3	6.0	40.8	23.0	40.3	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	30.6	8.9	40.0	19.3	6.0	40.8	23.0	40.3	22.8
Queue Length 50th (ft)	8	51	0	64	37	0	43	60	54	47
Queue Length 95th (ft)	39	128	50	174	115	41	126	137	152	107
Internal Link Dist (ft)		595			2562			576		255
Turn Bay Length (ft)	140		140	150		155	50		50	
Base Capacity (vph)	323	1063	564	514	1516	735	514	1114	514	1127
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.25	0.24	0.33	0.19	0.17	0.22	0.35	0.28	0.25

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	91	65	48	549	11	634
v/c Ratio	0.28	0.27	0.23	0.27	0.06	0.36
Control Delay	19.1	27.7	31.2	11.9	32.7	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	27.7	31.2	11.9	32.7	16.4
Queue Length 50th (ft)	18	16	14	46	3	81
Queue Length 95th (ft)	62	68	60	181	23	222
Internal Link Dist (ft)	2569	148		2306		3257
Turn Bay Length (ft)			60		75	
Base Capacity (vph)	647	649	577	2292	402	1909
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.10	0.08	0.24	0.03	0.33

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	116	253	95	200	274	353	105	611	300	642
v/c Ratio	0.45	0.43	0.28	0.73	0.31	0.54	0.61	0.71	0.74	0.48
Control Delay	55.3	42.6	10.1	59.0	32.3	6.4	63.9	40.8	51.2	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	42.6	10.1	59.0	32.3	6.4	63.9	40.8	51.2	26.3
Queue Length 50th (ft)	37	80	0	124	77	0	66	178	178	146
Queue Length 95th (ft)	82	135	44	245	122	65	152	325	#447	306
Internal Link Dist (ft)		2562			594			1877		277
Turn Bay Length (ft)	110		75	175		145	115		110	
Base Capacity (vph)	1110	1233	602	493	1157	742	258	1034	415	1383
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.21	0.16	0.41	0.24	0.48	0.41	0.59	0.72	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	T	TR	R	R
Maximum Queue (ft)	337	369	55	24	32	32	94	92
Average Queue (ft)	304	161	15	1	2	1	66	37
95th Queue (ft)	393	383	44	14	23	16	101	70
Link Distance (ft)	309	309		334	334	334	76	218
Upstream Blk Time (%)	24	2					77	
Queuing Penalty (veh)	156	12					0	
Storage Bay Dist (ft)			50					
Storage Blk Time (%)			2					
Queuing Penalty (veh)			9					

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	34	30	74	82	22	165	161	18	64	88	86
Average Queue (ft)	6	2	35	33	4	78	60	3	26	31	29
95th Queue (ft)	25	14	62	68	17	139	123	14	55	67	66
Link Distance (ft)	193	193	333	333			349	349		398	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					125	290			125		55
Storage Blk Time (%)										2	2
Queuing Penalty (veh)										5	4

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	65	16
Average Queue (ft)	24	1
95th Queue (ft)	51	9
Link Distance (ft)	257	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	69	50	22
Average Queue (ft)	32	4	1
95th Queue (ft)	57	29	12
Link Distance (ft)	236	349	349
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 186

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	T	TR	R	R
Maximum Queue (ft)	400	373	78	198	206	12	69	96
Average Queue (ft)	331	253	37	53	37	1	55	40
95th Queue (ft)	403	436	91	222	167	8	83	75
Link Distance (ft)	309	309		336	336	336	76	174
Upstream Blk Time (%)	28	4		5	0		69	
Queuing Penalty (veh)	255	35		25	0		0	
Storage Bay Dist (ft)			50					
Storage Blk Time (%)			50	1				
Queuing Penalty (veh)			207	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	141	99	686	717	110	230	310	73	215	512	280
Average Queue (ft)	40	40	356	389	28	93	109	27	67	367	222
95th Queue (ft)	106	81	782	808	103	222	255	54	192	678	365
Link Distance (ft)	193		735	735			366	366		496	
Upstream Blk Time (%)	0		11	20		0	3			37	
Queuing Penalty (veh)	0		0	0		0	9			201	
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	23	31		73	0	4	3		0	62	75
Queuing Penalty (veh)	13	13		15	0	12	2		0	198	233

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	183	35	395
Average Queue (ft)	89	2	193
95th Queue (ft)	194	19	488
Link Distance (ft)	170		380
Upstream Blk Time (%)	27		28
Queuing Penalty (veh)	0		139
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	43
Queuing Penalty (veh)		0	3

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	T
Maximum Queue (ft)	84	93	74	397	419
Average Queue (ft)	32	11	8	349	362
95th Queue (ft)	67	96	85	488	488
Link Distance (ft)	237	283	283	366	366
Upstream Blk Time (%)		2	1	34	39
Queuing Penalty (veh)		5	4	172	198
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 1739

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	T	TR	UL	TR	R	R
Maximum Queue (ft)	332	314	55	36	86	72
Average Queue (ft)	141	61	21	3	37	42
95th Queue (ft)	368	236	51	18	83	67
Link Distance (ft)	309	309		335	76	242
Upstream Blk Time (%)	8	0			30	
Queuing Penalty (veh)	52	2			0	
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			2			
Queuing Penalty (veh)			6			

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	31	34	240	257	96	118	169	136	148	224	166
Average Queue (ft)	4	5	150	137	18	41	64	38	47	65	53
95th Queue (ft)	20	24	314	312	66	95	133	85	102	199	149
Link Distance (ft)	193		292	292			354			523	
Upstream Blk Time (%)			21	19						1	
Queuing Penalty (veh)			0	0						4	
Storage Bay Dist (ft)		35			60	290		75	125		55
Storage Blk Time (%)	2	3		28	0		4	0	0	17	15
Queuing Penalty (veh)	0	0		8	0		11	1	0	38	32

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	89	4	30	36
Average Queue (ft)	37	0	6	2
95th Queue (ft)	69	3	25	29
Link Distance (ft)	152	523		349
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			50	
Storage Blk Time (%)			0	1
Queuing Penalty (veh)			0	0

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	68	354	364
Average Queue (ft)	29	195	180
95th Queue (ft)	52	454	452
Link Distance (ft)	246	354	354
Upstream Blk Time (%)		21	13
Queuing Penalty (veh)		86	55
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 295

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	R	R
Maximum Queue (ft)	49	30	57	41	58	82
Average Queue (ft)	15	1	2	2	21	37
95th Queue (ft)	41	20	29	17	49	65
Link Distance (ft)		334	334	334	63	218
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	50					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	3	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	39	31	69	97	31	177	214	21	64	78	130
Average Queue (ft)	8	5	28	45	4	92	76	5	27	25	49
95th Queue (ft)	30	23	58	79	19	151	159	18	57	60	102
Link Distance (ft)	193	193	333	333			349	349		398	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					125	290			125		55
Storage Blk Time (%)				0						1	6
Queuing Penalty (veh)				0						3	11

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	59	16
Average Queue (ft)	22	1
95th Queue (ft)	48	10
Link Distance (ft)	257	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB
Directions Served	R	T
Maximum Queue (ft)	86	32
Average Queue (ft)	37	2
95th Queue (ft)	69	29
Link Distance (ft)	236	349
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 16

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	R	R
Maximum Queue (ft)	28	14	29	45	49	77
Average Queue (ft)	2	0	1	2	21	33
95th Queue (ft)	15	10	16	18	47	62
Link Distance (ft)		336	336	336	63	174
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	50					
Storage Blk Time (%)		0				
Queuing Penalty (veh)		0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	92	97	449	483	110	114	210	77	184	419	263
Average Queue (ft)	33	34	176	229	26	46	97	31	51	144	131
95th Queue (ft)	71	71	512	599	94	91	176	60	115	372	261
Link Distance (ft)	193		703	703			365	365		496	
Upstream Blk Time (%)			3	10						2	
Queuing Penalty (veh)			0	0						13	
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	22	16		46	0				0	16	38
Queuing Penalty (veh)	13	8		9	0				0	51	120

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	79	32	163
Average Queue (ft)	36	2	11
95th Queue (ft)	62	14	94
Link Distance (ft)	170		380
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	2
Queuing Penalty (veh)		0	0

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	58	4	389	398
Average Queue (ft)	28	0	162	246
95th Queue (ft)	47	3	420	505
Link Distance (ft)	502	283	365	365
Upstream Blk Time (%)			2	15
Queuing Penalty (veh)			11	78
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 305

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	NB	SB
Directions Served	UL	TR	R	R
Maximum Queue (ft)	60	51	56	120
Average Queue (ft)	21	4	20	47
95th Queue (ft)	51	23	47	88
Link Distance (ft)		335	63	242
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	50			
Storage Blk Time (%)	2			
Queuing Penalty (veh)	6			

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	43	35	156	228	110	114	161	81	96	94	117
Average Queue (ft)	10	7	77	115	26	39	69	35	43	27	38
95th Queue (ft)	34	29	134	201	86	83	129	66	82	66	87
Link Distance (ft)	193		292	292			358	358		523	
Upstream Blk Time (%)				0							
Queuing Penalty (veh)				0							
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	4	2		24	0				0	2	5
Queuing Penalty (veh)	0	0		7	0				0	4	10

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	99	22
Average Queue (ft)	39	2
95th Queue (ft)	73	15
Link Distance (ft)	152	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	58	21	280	314
Average Queue (ft)	28	1	67	96
95th Queue (ft)	47	9	275	331
Link Distance (ft)	233	281	358	358
Upstream Blk Time (%)			0	4
Queuing Penalty (veh)			1	17
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 46

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	WB	WB	WB	WB	NB	SB
Directions Served	T	L	T	T	TR	R	R
Maximum Queue (ft)	30	52	31	29	44	73	91
Average Queue (ft)	1	14	1	2	2	22	38
95th Queue (ft)	17	40	14	15	17	56	70
Link Distance (ft)	306		334	334	334	63	218
Upstream Blk Time (%)						1	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)		50					
Storage Blk Time (%)		1	0				
Queuing Penalty (veh)		4	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	35	35	73	81	22	207	217	25	67	92	141
Average Queue (ft)	13	10	35	35	5	99	85	4	24	34	56
95th Queue (ft)	38	33	66	65	20	167	166	17	53	71	113
Link Distance (ft)	193	193	604	604			349	349		398	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					125	290			125		55
Storage Blk Time (%)				0						2	8
Queuing Penalty (veh)				0						5	17

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	68	18
Average Queue (ft)	21	1
95th Queue (ft)	53	10
Link Distance (ft)	257	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	115	11	15
Average Queue (ft)	37	1	1
95th Queue (ft)	77	9	12
Link Distance (ft)	236	349	349
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 25

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	WB	WB	WB	WB	NB	SB
Directions Served	TR	L	T	T	TR	R	R
Maximum Queue (ft)	38	30	99	126	50	55	102
Average Queue (ft)	2	4	8	11	2	19	38
95th Queue (ft)	21	21	50	65	22	46	74
Link Distance (ft)	306		336	336	336	63	174
Upstream Blk Time (%)						0	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)		50					
Storage Blk Time (%)		0	1				
Queuing Penalty (veh)		1	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	168	104	830	846	110	212	314	58	215	512	280
Average Queue (ft)	53	54	641	719	24	84	132	28	74	460	266
95th Queue (ft)	128	98	1035	1015	97	173	243	51	192	634	329
Link Distance (ft)	193		803	803			366	366		496	
Upstream Blk Time (%)	1		27	61			1			38	
Queuing Penalty (veh)	0		0	0			2			293	
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	27	46		94	0		1		0	62	83
Queuing Penalty (veh)	19	28		19	0		1		3	263	335

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	184	80	396
Average Queue (ft)	134	6	288
95th Queue (ft)	230	43	552
Link Distance (ft)	170		380
Upstream Blk Time (%)	66		30
Queuing Penalty (veh)	0		214
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	49
Queuing Penalty (veh)		0	3

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	T	T	T
Maximum Queue (ft)	82	45	401	406
Average Queue (ft)	32	2	358	379
95th Queue (ft)	58	38	461	401
Link Distance (ft)	237	283	366	366
Upstream Blk Time (%)			22	40
Queuing Penalty (veh)			137	246
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1563

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	WB	WB	WB	NB	SB
Directions Served	T	UL	T	TR	R	R
Maximum Queue (ft)	20	55	28	63	57	117
Average Queue (ft)	1	24	1	7	22	44
95th Queue (ft)	9	50	15	34	47	85
Link Distance (ft)	306		337	337	63	240
Upstream Blk Time (%)					0	0
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)		50				
Storage Blk Time (%)		1	0			
Queuing Penalty (veh)		8	0			

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	39	35	195	276	110	102	219	69	139	202	166
Average Queue (ft)	11	8	81	123	22	39	97	30	44	54	64
95th Queue (ft)	35	31	152	228	76	76	179	57	93	164	144
Link Distance (ft)	193		661	661			358	358		524	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	7	2		29	0		0		0	4	12
Queuing Penalty (veh)	1	0		9	0		0		0	11	33

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	83	28
Average Queue (ft)	40	5
95th Queue (ft)	72	21
Link Distance (ft)	152	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	84	6	311	347
Average Queue (ft)	32	0	100	137
95th Queue (ft)	58	6	338	392
Link Distance (ft)	233	281	358	358
Upstream Blk Time (%)			1	6
Queuing Penalty (veh)			6	26
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 94

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	34.4	55.2	0.18	11.8	F
E Bonnyview Rd	II	40	33.6	26.7	60.3	0.34	20.3	D
	II	50	55.9	3.2	59.1	0.78	47.3	A
Bechelli Lane	II	45	37.8	8.8	46.6	0.40	31.1	B
	II	35	19.2	19.5	38.7	0.15	14.3	E
I-5 NB Ramps	II	35	11.5	2.5	14.0	0.09	23.6	C
Churn Creek Rd	II	35	7.9	7.2	15.1	0.06	15.0	E
Total	II		186.7	102.3	289.0	2.01	25.0	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	34.6	42.5	0.06	5.3	F
I-5 SB Ramps	II	35	11.5	8.8	20.3	0.09	16.3	E
Bechelli Lane	II	35	19.2	17.6	36.8	0.15	15.0	E
Indianwood Dr	II	50	34.6	2.8	37.4	0.40	38.8	A
E Bonnyview Rd	II	50	55.9	19.5	75.4	0.78	37.1	A
Eastside Rd	II	40	33.6	22.5	56.1	0.34	21.8	D
State Route 273	II	40	20.8	36.3	57.1	0.18	11.4	F
Total	II		183.5	142.1	325.6	2.01	22.2	C

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	37.5	58.3	0.18	11.2	F
E Bonnyview Rd	II	40	33.3	24.2	57.5	0.34	21.1	D
	II	50	55.9	4.6	60.5	0.78	46.2	A
Bechelli Lane	II	45	37.8	8.1	45.9	0.40	31.6	B
	II	35	19.2	19.2	38.4	0.15	14.4	E
I-5 NB Ramps	II	35	11.5	6.6	18.1	0.09	18.2	D
Churn Creek Rd	II	35	7.9	11.0	18.9	0.06	12.0	F
Total	II		186.4	111.2	297.6	2.00	24.3	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	33.0	40.9	0.06	5.5	F
I-5 SB Ramps	II	35	11.5	5.7	17.2	0.09	19.2	D
Bechelli Lane	II	35	19.2	20.2	39.4	0.15	14.0	E
Indianwood Dr	II	50	34.6	9.8	44.4	0.40	32.6	B
E Bonnyview Rd	II	50	55.9	34.1	90.0	0.78	31.1	B
Eastside Rd	II	40	33.3	14.4	47.7	0.34	25.4	C
State Route 273	II	40	20.8	38.0	58.8	0.18	11.1	F
Total	II		183.2	155.2	338.4	2.00	21.3	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	23.0	43.8	0.18	14.9	E
E Bonnyview Rd	II	40	33.6	9.1	42.7	0.34	28.6	B
	II	50	55.9	3.7	59.6	0.78	46.9	A
Bechelli Lane	II	45	37.8	6.2	44.0	0.40	32.9	B
	II	35	19.2	7.6	26.8	0.15	20.6	D
I-5 NB Ramps	II	35	11.5	6.9	18.4	0.09	17.9	D
Churn Creek Rd	II	35	7.9	11.5	19.4	0.06	11.7	F
Total	II		186.7	68.0	254.7	2.01	28.4	B

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	24.6	32.5	0.06	7.0	F
I-5 SB Ramps	II	35	11.5	2.1	13.6	0.09	24.3	C
Bechelli Lane	II	35	19.2	8.0	27.2	0.15	20.3	D
Indianwood Dr	II	50	34.6	3.6	38.2	0.40	37.9	A
E Bonnyview Rd	II	50	55.9	13.6	69.5	0.78	40.2	A
Eastside Rd	II	40	33.6	12.8	46.4	0.34	26.4	C
State Route 273	II	40	20.8	26.1	46.9	0.18	13.9	E
Total	II		183.5	90.8	274.3	2.01	26.4	C

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	35.4	56.2	0.18	11.6	F
E Bonnyview Rd	II	40	33.6	30.1	63.7	0.34	19.2	D
	II	50	55.9	3.4	59.3	0.78	47.1	A
Bechelli Lane	II	45	37.8	13.9	51.7	0.40	28.0	B
	II	35	19.2	17.2	36.4	0.15	15.2	E
I-5 NB Ramps	II	35	11.5	2.6	14.1	0.09	23.4	C
Churn Creek Rd	II	35	7.9	6.9	14.8	0.06	15.3	E
Total	II		186.7	109.5	296.2	2.01	24.4	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	34.8	42.7	0.06	5.3	F
I-5 SB Ramps	II	35	11.5	8.8	20.3	0.09	16.3	E
Bechelli Lane	II	35	19.2	28.3	47.5	0.15	11.6	F
Indianwood Dr	II	50	34.6	3.0	37.6	0.40	38.6	A
E Bonnyview Rd	II	50	55.9	20.5	76.4	0.78	36.6	A
Eastside Rd	II	40	33.6	22.7	56.3	0.34	21.7	D
State Route 273	II	40	20.8	38.2	59.0	0.18	11.0	F
Total	II		183.5	156.3	339.8	2.01	21.3	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	38.3	59.1	0.18	11.0	F
E Bonnyview Rd	II	40	33.3	24.4	57.7	0.34	21.0	D
	II	50	55.9	4.7	60.6	0.78	46.1	A
Bechelli Lane	II	45	37.8	13.5	51.3	0.40	28.3	B
	II	35	19.2	19.6	38.8	0.15	14.3	E
I-5 NB Ramps	II	35	11.5	8.5	20.0	0.09	16.5	E
Churn Creek Rd	II	35	7.9	10.3	18.2	0.06	12.4	F
Total	II		186.4	119.3	305.7	2.00	23.6	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	35.9	43.8	0.06	5.2	F
I-5 SB Ramps	II	35	11.5	5.8	17.3	0.09	19.1	D
Bechelli Lane	II	35	19.2	37.9	57.1	0.15	9.7	F
Indianwood Dr	II	50	34.6	6.4	41.0	0.40	35.4	A
E Bonnyview Rd	II	50	55.9	34.7	90.6	0.78	30.8	B
Eastside Rd	II	40	33.3	14.7	48.0	0.34	25.3	C
State Route 273	II	40	20.8	38.5	59.3	0.18	11.0	F
Total	II		183.2	173.9	357.1	2.00	20.2	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	24.4	45.2	0.18	14.4	E
E Bonnyview Rd	II	40	33.6	9.4	43.0	0.34	28.4	B
	II	50	55.9	3.8	59.7	0.78	46.8	A
Bechelli Lane	II	45	37.8	15.5	53.3	0.40	27.2	C
	II	35	19.2	21.4	40.6	0.15	13.6	E
I-5 NB Ramps	II	35	11.5	1.0	12.5	0.09	26.4	C
Churn Creek Rd	II	35	7.9	9.8	17.7	0.06	12.8	F
Total	II		186.7	85.3	272.0	2.01	26.6	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	37.2	45.1	0.06	5.0	F
I-5 SB Ramps	II	35	11.5	9.6	21.1	0.09	15.6	E
Bechelli Lane	II	35	19.2	21.5	40.7	0.15	13.6	E
Indianwood Dr	II	50	34.6	3.7	38.3	0.40	37.8	A
E Bonnyview Rd	II	50	55.9	14.0	69.9	0.78	40.0	A
Eastside Rd	II	40	33.6	13.0	46.6	0.34	26.2	C
State Route 273	II	40	20.8	25.9	46.7	0.18	13.9	E
Total	II		183.5	124.9	308.4	2.01	23.4	C

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	35.9	56.7	0.18	11.5	F
E Bonnyview Rd	II	40	33.6	39.2	72.8	0.34	16.8	E
	II	50	55.9	4.3	60.2	0.78	46.4	A
Bechelli Lane	II	45	37.8	10.8	48.6	0.40	29.8	B
	II	35	19.2	22.8	42.0	0.15	13.2	E
I-5 NB Ramps	II	35	11.5	1.0	12.5	0.09	26.4	C
Churn Creek Rd	II	35	7.9	20.3	28.2	0.06	8.0	F
Total	II		186.7	134.3	321.0	2.01	22.5	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	32.4	40.3	0.06	5.6	F
I-5 SB Ramps	II	35	11.5	12.7	24.2	0.09	13.6	E
Bechelli Lane	II	35	19.2	21.8	41.0	0.15	13.5	E
Indianwood Dr	II	50	34.6	4.6	39.2	0.40	37.0	A
E Bonnyview Rd	II	50	55.9	24.6	80.5	0.78	34.7	B
Eastside Rd	II	40	33.6	23.6	57.2	0.34	21.4	D
State Route 273	II	40	20.8	38.7	59.5	0.18	10.9	F
Total	II		183.5	158.4	341.9	2.01	21.1	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.4	38.6	59.0	0.18	10.8	F
E Bonnyview Rd	II	40	33.5	24.8	58.3	0.34	20.9	D
	II	50	55.9	5.8	61.7	0.78	45.3	A
Bechelli Lane	II	45	37.8	8.0	45.8	0.40	31.6	B
	II	35	19.2	20.6	39.8	0.15	13.9	E
I-5 NB Ramps	II	35	11.5	7.1	18.6	0.09	17.7	D
Churn Creek Rd	II	35	7.9	19.6	27.5	0.06	8.2	F
Total	II		186.2	124.5	310.7	2.00	23.2	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	28.4	36.3	0.06	6.2	F
I-5 SB Ramps	II	35	11.5	6.0	17.5	0.09	18.9	D
Bechelli Lane	II	35	19.2	20.9	40.1	0.15	13.8	E
Indianwood Dr	II	50	34.6	12.8	47.4	0.40	30.6	B
E Bonnyview Rd	II	50	55.9	34.5	90.4	0.78	30.9	B
Eastside Rd	II	40	33.5	15.3	48.8	0.34	24.9	C
State Route 273	II	40	20.4	38.9	59.3	0.18	10.8	F
Total	II		183.0	156.8	339.8	2.00	21.2	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	24.7	45.5	0.18	14.3	E
E Bonnyview Rd	II	30	43.2	9.9	53.1	0.34	23.0	C
	II	50	55.9	4.1	60.0	0.78	46.6	A
Bechelli Lane	II	45	37.8	6.9	44.7	0.40	32.4	B
	II	35	19.2	9.7	28.9	0.15	19.1	D
I-5 NB Ramps	II	35	11.5	5.8	17.3	0.09	19.1	D
Churn Creek Rd	II	35	7.9	20.5	28.4	0.06	8.0	F
Total	II		196.3	81.6	277.9	2.01	26.0	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	20.5	28.4	0.06	8.0	F
I-5 SB Ramps	II	35	11.5	9.0	20.5	0.09	16.1	E
Bechelli Lane	II	35	19.2	7.8	27.0	0.15	20.5	D
Indianwood Dr	II	50	34.6	4.0	38.6	0.40	37.6	A
E Bonnyview Rd	II	50	55.9	14.6	70.5	0.78	39.6	A
Eastside Rd	II	40	33.6	14.6	48.2	0.34	25.4	C
State Route 273	II	40	20.8	26.8	47.6	0.18	13.7	E
Total	II		183.5	97.3	280.8	2.01	25.7	C

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	36.8	57.6	0.18	11.3	F
E Bonnyview Rd	II	40	33.6	45.9	79.5	0.34	15.4	E
	II	50	55.9	4.6	60.5	0.78	46.2	A
Bechelli Lane	II	45	37.8	15.3	53.1	0.40	27.3	C
	II	35	19.2	20.8	40.0	0.15	13.8	E
I-5 NB Ramps	II	35	11.5	1.5	13.0	0.09	25.4	C
Churn Creek Rd	II	35	7.9	19.7	27.6	0.06	8.2	F
Total	II		186.7	144.6	331.3	2.01	21.8	D

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	36.6	44.5	0.06	5.1	F
I-5 SB Ramps	II	35	11.5	11.2	22.7	0.09	14.5	E
Bechelli Lane	II	35	19.2	44.7	63.9	0.15	8.7	F
Indianwood Dr	II	50	34.6	4.9	39.5	0.40	36.7	A
E Bonnyview Rd	II	50	55.9	25.5	81.4	0.78	34.3	B
Eastside Rd	II	40	33.6	23.8	57.4	0.34	21.3	D
State Route 273	II	40	20.8	40.1	60.9	0.18	10.7	F
Total	II		183.5	186.8	370.3	2.01	19.5	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	39.3	60.1	0.18	10.8	F
E Bonnyview Rd	II	40	33.3	25.4	58.7	0.34	20.7	D
	II	50	55.9	6.0	61.9	0.78	45.1	A
Bechelli Lane	II	45	37.8	12.6	50.4	0.40	28.8	B
	II	35	19.2	19.7	38.9	0.15	14.2	E
I-5 NB Ramps	II	35	11.5	9.0	20.5	0.09	16.1	E
Churn Creek Rd	II	35	7.9	19.2	27.1	0.06	8.4	F
Total	II		186.4	131.2	317.6	2.00	22.7	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	37.9	45.8	0.06	4.9	F
I-5 SB Ramps	II	35	11.5	6.0	17.5	0.09	18.9	D
Bechelli Lane	II	35	19.2	37.6	56.8	0.15	9.7	F
Indianwood Dr	II	50	34.6	9.3	43.9	0.40	33.0	B
E Bonnyview Rd	II	50	55.9	36.7	92.6	0.78	30.2	B
Eastside Rd	II	40	33.3	15.6	48.9	0.34	24.8	C
State Route 273	II	40	20.8	39.3	60.1	0.18	10.8	F
Total	II		183.2	182.4	365.6	2.00	19.7	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	26.0	46.8	0.18	13.9	E
E Bonnyview Rd	II	40	33.6	10.3	43.9	0.34	27.9	C
	II	50	55.9	4.7	60.6	0.78	46.1	A
Bechelli Lane	II	45	37.8	15.6	53.4	0.40	27.1	C
	II	35	19.2	22.0	41.2	0.15	13.4	E
I-5 NB Ramps	II	35	11.5	1.1	12.6	0.09	26.2	C
Churn Creek Rd	II	35	7.9	20.3	28.2	0.06	8.0	F
Total	II		186.7	100.0	286.7	2.01	25.2	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	28.8	36.7	0.06	6.2	F
I-5 SB Ramps	II	35	11.5	14.0	25.5	0.09	12.9	F
Bechelli Lane	II	35	19.2	20.6	39.8	0.15	13.9	E
Indianwood Dr	II	50	34.6	4.7	39.3	0.40	36.9	A
E Bonnyview Rd	II	50	55.9	15.1	71.0	0.78	39.4	A
Eastside Rd	II	40	33.6	14.6	48.2	0.34	25.4	C
State Route 273	II	40	20.8	26.9	47.7	0.18	13.7	E
Total	II		183.5	124.7	308.2	2.01	23.5	C

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	40.1	60.9	0.18	10.7	F
E Bonnyview Rd	II	40	33.6	37.6	71.2	0.34	17.2	D
	II	50	55.9	5.4	61.3	0.78	45.6	A
Bechelli Lane	II	45	37.8	13.4	51.2	0.40	28.3	B
	II	35	19.2	18.9	38.1	0.15	14.5	E
I-5 NB Ramps	II	35	11.5	2.9	14.4	0.09	22.9	C
Churn Creek Rd	II	35	7.9	17.6	25.5	0.06	8.9	F
Total	II		186.7	135.9	322.6	2.01	22.4	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	38.2	46.1	0.06	4.9	F
I-5 SB Ramps	II	35	11.5	11.6	23.1	0.09	14.3	E
Bechelli Lane	II	35	19.2	27.6	46.8	0.15	11.8	F
Indianwood Dr	II	50	34.6	5.2	39.8	0.40	36.4	A
E Bonnyview Rd	II	50	55.9	25.8	81.7	0.78	34.2	B
Eastside Rd	II	40	33.6	25.2	58.8	0.34	20.8	D
State Route 273	II	40	20.8	39.9	60.7	0.18	10.7	F
Total	II		183.5	173.5	357.0	2.01	20.2	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.4	41.3	61.7	0.18	10.4	F
E Bonnyview Rd	II	40	33.5	29.7	63.2	0.34	19.3	D
	II	50	55.9	8.3	64.2	0.78	43.5	A
Bechelli Lane	II	45	37.8	13.7	51.5	0.40	28.1	B
	II	35	19.2	20.6	39.8	0.15	13.9	E
I-5 NB Ramps	II	35	11.5	8.8	20.3	0.09	16.3	E
Churn Creek Rd	II	35	7.9	17.6	25.5	0.06	8.9	F
Total	II		186.2	140.0	326.2	2.00	22.1	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	36.7	44.6	0.06	5.1	F
I-5 SB Ramps	II	35	11.5	5.7	17.2	0.09	19.2	D
Bechelli Lane	II	35	19.2	32.1	51.3	0.15	10.8	F
Indianwood Dr	II	50	34.6	15.2	49.8	0.40	29.1	B
E Bonnyview Rd	II	50	55.9	48.6	104.5	0.78	26.7	C
Eastside Rd	II	40	33.5	17.8	51.3	0.34	23.7	C
State Route 273	II	40	20.4	41.8	62.2	0.18	10.3	F
Total	II		183.0	197.9	380.9	2.00	18.9	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	27.1	47.9	0.18	13.6	E
E Bonnyview Rd	II	30	43.2	11.3	54.5	0.34	22.4	C
	II	50	55.9	6.7	62.6	0.78	44.6	A
Bechelli Lane	II	45	37.8	8.8	46.6	0.40	31.1	B
	II	35	19.2	10.4	29.6	0.15	18.7	D
I-5 NB Ramps	II	35	11.5	6.8	18.3	0.09	18.0	D
Churn Creek Rd	II	35	7.9	19.5	27.4	0.06	8.3	F
Total	II		196.3	90.6	286.9	2.01	25.2	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	25.4	33.3	0.06	6.8	F
I-5 SB Ramps	II	35	11.5	5.9	17.4	0.09	19.0	D
Bechelli Lane	II	35	19.2	10.7	29.9	0.15	18.5	D
Indianwood Dr	II	50	34.6	6.7	41.3	0.40	35.1	A
E Bonnyview Rd	II	50	55.9	17.5	73.4	0.78	38.1	A
Eastside Rd	II	40	33.6	15.3	48.9	0.34	25.0	C
State Route 273	II	40	20.8	30.0	50.8	0.18	12.8	F
Total	II		183.5	111.5	295.0	2.01	24.5	C

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	43.6	64.4	0.18	10.1	F
E Bonnyview Rd	II	40	33.6	103.4	137.0	0.34	8.9	F
	II	50	55.9	7.1	63.0	0.78	44.4	A
Bechelli Lane	II	45	37.8	20.5	58.3	0.40	24.9	C
	II	35	19.2	16.5	35.7	0.15	15.5	E
I-5 NB Ramps	II	35	11.5	2.5	14.0	0.09	23.6	C
Churn Creek Rd	II	35	7.9	17.4	25.3	0.06	8.9	F
Total	II		186.7	211.0	397.7	2.01	18.2	D

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	41.5	49.4	0.06	4.6	F
I-5 SB Ramps	II	35	11.5	10.5	22.0	0.09	15.0	E
Bechelli Lane	II	35	19.2	165.1	184.3	0.15	3.0	F
Indianwood Dr	II	50	34.6	6.6	41.2	0.40	35.2	A
E Bonnyview Rd	II	50	55.9	35.2	91.1	0.78	30.7	B
Eastside Rd	II	40	33.6	26.3	59.9	0.34	20.4	D
State Route 273	II	40	20.8	42.0	62.8	0.18	10.4	F
Total	II		183.5	327.2	510.7	2.01	14.2	E

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	42.5	63.3	0.18	10.3	F
E Bonnyview Rd	II	40	33.3	31.5	64.8	0.34	18.7	D
	II	50	55.9	8.6	64.5	0.78	43.3	A
Bechelli Lane	II	45	37.8	16.4	54.2	0.40	26.7	C
	II	35	19.2	20.3	39.5	0.15	14.0	E
I-5 NB Ramps	II	35	11.5	10.0	21.5	0.09	15.3	E
Churn Creek Rd	II	35	7.9	17.2	25.1	0.06	9.0	F
Total	II		186.4	146.5	332.9	2.00	21.7	D

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	51.0	58.9	0.06	3.8	F
I-5 SB Ramps	II	35	11.5	5.9	17.4	0.09	19.0	D
Bechelli Lane	II	35	19.2	66.9	86.1	0.15	6.4	F
Indianwood Dr	II	50	34.6	12.0	46.6	0.40	31.1	B
E Bonnyview Rd	II	50	55.9	62.6	118.5	0.78	23.6	C
Eastside Rd	II	40	33.3	18.4	51.7	0.34	23.4	C
State Route 273	II	40	20.8	42.6	63.4	0.18	10.3	F
Total	II		183.2	259.4	442.6	2.00	16.3	E

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	28.8	49.6	0.18	13.1	E
E Bonnyview Rd	II	40	33.6	11.9	45.5	0.34	26.9	C
	II	50	55.9	6.9	62.8	0.78	44.5	A
Bechelli Lane	II	45	37.8	16.0	53.8	0.40	26.9	C
	II	35	19.2	21.1	40.3	0.15	13.7	E
I-5 NB Ramps	II	35	11.5	1.4	12.9	0.09	25.6	C
Churn Creek Rd	II	35	7.9	17.1	25.0	0.06	9.1	F
Total	II		186.7	103.2	289.9	2.01	24.9	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	33.4	41.3	0.06	5.5	F
I-5 SB Ramps	II	35	11.5	11.6	23.1	0.09	14.3	E
Bechelli Lane	II	35	19.2	23.3	42.5	0.15	13.0	E
Indianwood Dr	II	50	34.6	7.0	41.6	0.40	34.8	B
E Bonnyview Rd	II	50	55.9	18.2	74.1	0.78	37.7	A
Eastside Rd	II	40	33.6	15.4	49.0	0.34	25.0	C
State Route 273	II	40	20.8	30.0	50.8	0.18	12.8	F
Total	II		183.5	138.9	322.4	2.01	22.4	C

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	T	TR	R	R
Maximum Queue (ft)	337	369	55	24	32	32	94	92
Average Queue (ft)	304	161	15	1	2	1	66	37
95th Queue (ft)	393	383	44	14	23	16	101	70
Link Distance (ft)	309	309		334	334	334	76	218
Upstream Blk Time (%)	24	2					77	
Queuing Penalty (veh)	156	12					0	
Storage Bay Dist (ft)			50					
Storage Blk Time (%)			2					
Queuing Penalty (veh)			9					

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	34	30	74	82	22	165	161	18	64	88	86
Average Queue (ft)	6	2	35	33	4	78	60	3	26	31	29
95th Queue (ft)	25	14	62	68	17	139	123	14	55	67	66
Link Distance (ft)	193	193	333	333			349	349		398	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					125	290			125		55
Storage Blk Time (%)										2	2
Queuing Penalty (veh)										5	4

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	65	16
Average Queue (ft)	24	1
95th Queue (ft)	51	9
Link Distance (ft)	257	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	69	50	22
Average Queue (ft)	32	4	1
95th Queue (ft)	57	29	12
Link Distance (ft)	236	349	349
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 186

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	T	TR	R	R
Maximum Queue (ft)	400	373	78	198	206	12	69	96
Average Queue (ft)	331	253	37	53	37	1	55	40
95th Queue (ft)	403	436	91	222	167	8	83	75
Link Distance (ft)	309	309		336	336	336	76	174
Upstream Blk Time (%)	28	4		5	0		69	
Queuing Penalty (veh)	255	35		25	0		0	
Storage Bay Dist (ft)			50					
Storage Blk Time (%)			50	1				
Queuing Penalty (veh)			207	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	141	99	686	717	110	230	310	73	215	512	280
Average Queue (ft)	40	40	356	389	28	93	109	27	67	367	222
95th Queue (ft)	106	81	782	808	103	222	255	54	192	678	365
Link Distance (ft)	193		735	735			366	366		496	
Upstream Blk Time (%)	0		11	20		0	3			37	
Queuing Penalty (veh)	0		0	0		0	9			201	
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	23	31		73	0	4	3		0	62	75
Queuing Penalty (veh)	13	13		15	0	12	2		0	198	233

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	183	35	395
Average Queue (ft)	89	2	193
95th Queue (ft)	194	19	488
Link Distance (ft)	170		380
Upstream Blk Time (%)	27		28
Queuing Penalty (veh)	0		139
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	43
Queuing Penalty (veh)		0	3

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	T
Maximum Queue (ft)	84	93	74	397	419
Average Queue (ft)	32	11	8	349	362
95th Queue (ft)	67	96	85	488	488
Link Distance (ft)	237	283	283	366	366
Upstream Blk Time (%)		2	1	34	39
Queuing Penalty (veh)		5	4	172	198
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 1739

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	T	TR	UL	TR	R	R
Maximum Queue (ft)	332	314	55	36	86	72
Average Queue (ft)	141	61	21	3	37	42
95th Queue (ft)	368	236	51	18	83	67
Link Distance (ft)	309	309		335	76	242
Upstream Blk Time (%)	8	0			30	
Queuing Penalty (veh)	52	2			0	
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			2			
Queuing Penalty (veh)			6			

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	31	34	240	257	96	118	169	136	148	224	166
Average Queue (ft)	4	5	150	137	18	41	64	38	47	65	53
95th Queue (ft)	20	24	314	312	66	95	133	85	102	199	149
Link Distance (ft)	193		292	292			354			523	
Upstream Blk Time (%)			21	19						1	
Queuing Penalty (veh)			0	0						4	
Storage Bay Dist (ft)		35			60	290		75	125		55
Storage Blk Time (%)	2	3		28	0		4	0	0	17	15
Queuing Penalty (veh)	0	0		8	0		11	1	0	38	32

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	89	4	30	36
Average Queue (ft)	37	0	6	2
95th Queue (ft)	69	3	25	29
Link Distance (ft)	152	523		349
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			50	
Storage Blk Time (%)			0	1
Queuing Penalty (veh)			0	0

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	68	354	364
Average Queue (ft)	29	195	180
95th Queue (ft)	52	454	452
Link Distance (ft)	246	354	354
Upstream Blk Time (%)		21	13
Queuing Penalty (veh)		86	55
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 295

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	R	R
Maximum Queue (ft)	49	30	57	41	58	82
Average Queue (ft)	15	1	2	2	21	37
95th Queue (ft)	41	20	29	17	49	65
Link Distance (ft)		334	334	334	63	218
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	50					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	3	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	39	31	69	97	31	177	214	21	64	78	130
Average Queue (ft)	8	5	28	45	4	92	76	5	27	25	49
95th Queue (ft)	30	23	58	79	19	151	159	18	57	60	102
Link Distance (ft)	193	193	333	333			349	349		398	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					125	290			125		55
Storage Blk Time (%)				0						1	6
Queuing Penalty (veh)				0						3	11

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	59	16
Average Queue (ft)	22	1
95th Queue (ft)	48	10
Link Distance (ft)	257	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB
Directions Served	R	T
Maximum Queue (ft)	86	32
Average Queue (ft)	37	2
95th Queue (ft)	69	29
Link Distance (ft)	236	349
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 16

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	R	R
Maximum Queue (ft)	28	14	29	45	49	77
Average Queue (ft)	2	0	1	2	21	33
95th Queue (ft)	15	10	16	18	47	62
Link Distance (ft)		336	336	336	63	174
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	50					
Storage Blk Time (%)		0				
Queuing Penalty (veh)		0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	92	97	449	483	110	114	210	77	184	419	263
Average Queue (ft)	33	34	176	229	26	46	97	31	51	144	131
95th Queue (ft)	71	71	512	599	94	91	176	60	115	372	261
Link Distance (ft)	193		703	703			365	365		496	
Upstream Blk Time (%)			3	10						2	
Queuing Penalty (veh)			0	0						13	
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	22	16		46	0				0	16	38
Queuing Penalty (veh)	13	8		9	0				0	51	120

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	79	32	163
Average Queue (ft)	36	2	11
95th Queue (ft)	62	14	94
Link Distance (ft)	170		380
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	2
Queuing Penalty (veh)		0	0

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	58	4	389	398
Average Queue (ft)	28	0	162	246
95th Queue (ft)	47	3	420	505
Link Distance (ft)	502	283	365	365
Upstream Blk Time (%)			2	15
Queuing Penalty (veh)			11	78
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 305

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	NB	SB
Directions Served	UL	TR	R	R
Maximum Queue (ft)	60	51	56	120
Average Queue (ft)	21	4	20	47
95th Queue (ft)	51	23	47	88
Link Distance (ft)		335	63	242
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	50			
Storage Blk Time (%)	2			
Queuing Penalty (veh)	6			

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	43	35	156	228	110	114	161	81	96	94	117
Average Queue (ft)	10	7	77	115	26	39	69	35	43	27	38
95th Queue (ft)	34	29	134	201	86	83	129	66	82	66	87
Link Distance (ft)	193		292	292			358	358		523	
Upstream Blk Time (%)				0							
Queuing Penalty (veh)				0							
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	4	2		24	0				0	2	5
Queuing Penalty (veh)	0	0		7	0				0	4	10

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	99	22
Average Queue (ft)	39	2
95th Queue (ft)	73	15
Link Distance (ft)	152	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	58	21	280	314
Average Queue (ft)	28	1	67	96
95th Queue (ft)	47	9	275	331
Link Distance (ft)	233	281	358	358
Upstream Blk Time (%)			0	4
Queuing Penalty (veh)			1	17
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 46

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	WB	WB	WB	WB	NB	SB
Directions Served	T	L	T	T	TR	R	R
Maximum Queue (ft)	30	52	31	29	44	73	91
Average Queue (ft)	1	14	1	2	2	22	38
95th Queue (ft)	17	40	14	15	17	56	70
Link Distance (ft)	306		334	334	334	63	218
Upstream Blk Time (%)						1	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)		50					
Storage Blk Time (%)		1	0				
Queuing Penalty (veh)		4	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	35	35	73	81	22	207	217	25	67	92	141
Average Queue (ft)	13	10	35	35	5	99	85	4	24	34	56
95th Queue (ft)	38	33	66	65	20	167	166	17	53	71	113
Link Distance (ft)	193	193	604	604			349	349		398	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					125	290			125		55
Storage Blk Time (%)				0						2	8
Queuing Penalty (veh)				0						5	17

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	68	18
Average Queue (ft)	21	1
95th Queue (ft)	53	10
Link Distance (ft)	257	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	115	11	15
Average Queue (ft)	37	1	1
95th Queue (ft)	77	9	12
Link Distance (ft)	236	349	349
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 25

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	WB	WB	WB	WB	NB	SB
Directions Served	TR	L	T	T	TR	R	R
Maximum Queue (ft)	38	30	99	126	50	55	102
Average Queue (ft)	2	4	8	11	2	19	38
95th Queue (ft)	21	21	50	65	22	46	74
Link Distance (ft)	306		336	336	336	63	174
Upstream Blk Time (%)						0	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)		50					
Storage Blk Time (%)		0	1				
Queuing Penalty (veh)		1	0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	168	104	830	846	110	212	314	58	215	512	280
Average Queue (ft)	53	54	641	719	24	84	132	28	74	460	266
95th Queue (ft)	128	98	1035	1015	97	173	243	51	192	634	329
Link Distance (ft)	193		803	803			366	366		496	
Upstream Blk Time (%)	1		27	61			1			38	
Queuing Penalty (veh)	0		0	0			2			293	
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	27	46		94	0		1		0	62	83
Queuing Penalty (veh)	19	28		19	0		1		3	263	335

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	184	80	396
Average Queue (ft)	134	6	288
95th Queue (ft)	230	43	552
Link Distance (ft)	170		380
Upstream Blk Time (%)	66		30
Queuing Penalty (veh)	0		214
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	49
Queuing Penalty (veh)		0	3

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	T	T	T
Maximum Queue (ft)	82	45	401	406
Average Queue (ft)	32	2	358	379
95th Queue (ft)	58	38	461	401
Link Distance (ft)	237	283	366	366
Upstream Blk Time (%)			22	40
Queuing Penalty (veh)			137	246
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1563

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	EB	WB	WB	WB	NB	SB
Directions Served	T	UL	T	TR	R	R
Maximum Queue (ft)	20	55	28	63	57	117
Average Queue (ft)	1	24	1	7	22	44
95th Queue (ft)	9	50	15	34	47	85
Link Distance (ft)	306		337	337	63	240
Upstream Blk Time (%)					0	0
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)		50				
Storage Blk Time (%)		1	0			
Queuing Penalty (veh)		8	0			

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	39	35	195	276	110	102	219	69	139	202	166
Average Queue (ft)	11	8	81	123	22	39	97	30	44	54	64
95th Queue (ft)	35	31	152	228	76	76	179	57	93	164	144
Link Distance (ft)	193		661	661			358	358		524	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	7	2		29	0		0		0	4	12
Queuing Penalty (veh)	1	0		9	0		0		0	11	33

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	83	28
Average Queue (ft)	40	5
95th Queue (ft)	72	21
Link Distance (ft)	152	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

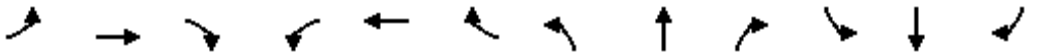
Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	84	6	311	347
Average Queue (ft)	32	0	100	137
95th Queue (ft)	58	6	338	392
Link Distance (ft)	233	281	358	358
Upstream Blk Time (%)			1	6
Queuing Penalty (veh)			6	26
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 94

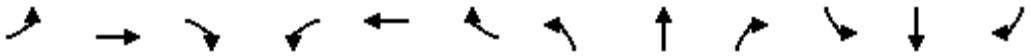
Mitigated LOS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1024	328	147	901	0	0	0	0	83	1	621
Future Volume (vph)	0	1024	328	147	901	0	0	0	0	83	1	621
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6285	1517	1562	3471						1741	2733
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6285	1517	1562	3471						1741	2733
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	1205	386	173	1060	0	0	0	0	98	1	731
RTOR Reduction (vph)	0	0	229	0	0	0	0	0	0	0	0	200
Lane Group Flow (vph)	0	1205	157	173	1060	0	0	0	0	0	99	531
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		36.7	36.7	14.3	55.2						25.1	25.1
Effective Green, g (s)		36.7	36.7	14.3	55.2						25.1	25.1
Actuated g/C Ratio		0.41	0.41	0.16	0.61						0.28	0.28
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2562	618	248	2128						485	762
v/s Ratio Prot		0.19		c0.11	c0.31						0.06	
v/s Ratio Perm			0.10									c0.19
v/c Ratio		0.47	0.25	0.70	0.50						0.20	0.70
Uniform Delay, d1		19.5	17.6	35.8	9.7						24.8	29.0
Progression Factor		0.76	0.63	0.51	0.79						1.00	1.00
Incremental Delay, d2		0.6	0.9	6.3	0.7						0.2	2.6
Delay (s)		15.3	12.1	24.5	8.4						25.0	31.6
Level of Service		B	B	C	A						C	C
Approach Delay (s)		14.5			10.7			0.0			30.8	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	568	550	0	0	545	309	494	0	198	0	0	0
Future Volume (vph)	568	550	0	0	545	309	494	0	198	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1	4.6	4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568	1665	1665	1568			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568	1665	1665	1568			
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	645	625	0	0	619	351	561	0	225	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	205	0	0	173	0	0	0
Lane Group Flow (vph)	645	625	0	0	619	146	280	281	52	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	22.5	59.5			32.8	32.8	20.8	20.8	20.8			
Effective Green, g (s)	22.5	59.5			32.8	32.8	20.8	20.8	20.8			
Actuated g/C Ratio	0.25	0.66			0.36	0.36	0.23	0.23	0.23			
Clearance Time (s)	4.2	5.1			5.1	5.1	4.6	4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0	3.2	3.2	3.2			
Lane Grp Cap (vph)	765	2317			1277	571	384	384	362			
v/s Ratio Prot	c0.21	0.18			c0.18		0.17	c0.17				
v/s Ratio Perm						0.09			0.03			
v/c Ratio	0.84	0.27			0.48	0.26	0.73	0.73	0.14			
Uniform Delay, d1	32.1	6.3			22.1	20.0	32.0	32.0	27.5			
Progression Factor	0.34	0.10			1.01	1.70	1.00	1.00	1.00			
Incremental Delay, d2	7.5	0.3			1.2	1.0	6.9	7.1	0.2			
Delay (s)	18.5	0.9			23.4	35.1	38.9	39.1	27.7			
Level of Service	B	A			C	D	D	D	C			
Approach Delay (s)		9.8			27.6			35.8			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	1205	593	2	228	814	0	0	0	0	162	0
Future Volume (vph)	0	1205	593	2	228	814	0	0	0	0	162	0
Ideal Flow (vphpl)	1900	1900	1900	1710	1710	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1		4.2	5.1						4.6
Lane Util. Factor		0.86	1.00		1.00	0.95						1.00
Frpb, ped/bikes		1.00	0.98		1.00	1.00						1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00						1.00
Frt		1.00	0.85		1.00	1.00						1.00
Flt Protected		1.00	1.00		0.95	1.00						0.95
Satd. Flow (prot)		6346	1532		1577	3505						1752
Flt Permitted		1.00	1.00		0.95	1.00						0.95
Satd. Flow (perm)		6346	1532		1577	3505						1752
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1282	631	2	243	866	0	0	0	0	172	0
RTOR Reduction (vph)	0	0	390	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1282	241	0	245	866	0	0	0	0	0	172
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	Prot	NA					Split	NA
Protected Phases		2		1	1	6					4	4
Permitted Phases			2									
Actuated Green, G (s)		30.3	30.3		16.4	50.9						18.8
Effective Green, g (s)		30.3	30.3		16.4	50.9						18.8
Actuated g/C Ratio		0.38	0.38		0.21	0.64						0.24
Clearance Time (s)		5.1	5.1		4.2	5.1						4.6
Vehicle Extension (s)		4.0	4.0		2.0	4.0						2.5
Lane Grp Cap (vph)		2421	584		325	2246						414
v/s Ratio Prot		c0.20			c0.16	0.25						0.10
v/s Ratio Perm			0.16									
v/c Ratio		0.53	0.41		0.75	0.39						0.42
Uniform Delay, d1		19.0	18.0		29.6	6.8						25.6
Progression Factor		1.00	1.00		1.00	1.00						1.00
Incremental Delay, d2		0.3	0.6		8.5	0.2						0.5
Delay (s)		19.3	18.7		38.1	6.9						26.1
Level of Service		B	B		D	A						C
Approach Delay (s)		19.1				13.8			0.0			29.7
Approach LOS		B				B			A			C

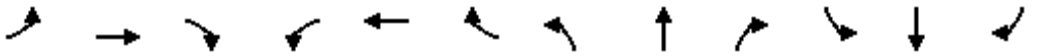
Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	13.9
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	664
Future Volume (vph)	664
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.6
Lane Util. Factor	0.88
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	2760
Flt Permitted	1.00
Satd. Flow (perm)	2760
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	706
RTOR Reduction (vph)	255
Lane Group Flow (vph)	451
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	18.8
Effective Green, g (s)	18.8
Actuated g/C Ratio	0.24
Clearance Time (s)	4.6
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	653
v/s Ratio Prot	
v/s Ratio Perm	c0.16
v/c Ratio	0.69
Uniform Delay, d1	27.6
Progression Factor	1.00
Incremental Delay, d2	2.9
Delay (s)	30.6
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	656	698	0	0	650	180	386	0	199	0	0	0
Future Volume (vph)	656	698	0	0	650	180	386	0	199	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1	4.6	4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568	1665	1665	1568			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568	1665	1665	1568			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	691	735	0	0	684	189	406	0	209	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	81	0	0	169	0	0	0
Lane Group Flow (vph)	691	735	0	0	684	108	203	203	40	0	0	0
Confl. Peds. (#/hr)			3									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	26.4	71.0			40.4	40.4	19.3	19.3	19.3			
Effective Green, g (s)	26.4	71.0			40.4	40.4	19.3	19.3	19.3			
Actuated g/C Ratio	0.26	0.71			0.40	0.40	0.19	0.19	0.19			
Clearance Time (s)	4.2	5.1			5.1	5.1	4.6	4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0	3.2	3.2	3.2			
Lane Grp Cap (vph)	807	2488			1416	633	321	321	302			
v/s Ratio Prot	c0.23	0.21			c0.20		c0.12	0.12				
v/s Ratio Perm						0.07			0.03			
v/c Ratio	0.86	0.30			0.48	0.17	0.63	0.63	0.13			
Uniform Delay, d1	35.0	5.3			22.1	19.1	37.1	37.1	33.4			
Progression Factor	1.00	1.00			1.02	1.32	1.00	1.00	1.00			
Incremental Delay, d2	8.6	0.3			1.1	0.5	4.1	4.1	0.2			
Delay (s)	43.6	5.6			23.6	25.7	41.2	41.2	33.6			
Level of Service	D	A			C	C	D	D	C			
Approach Delay (s)		24.0			24.0			38.6			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



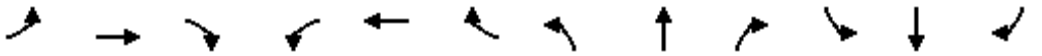
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	332	999	15	10	30	1018	415	15	15	20	332	5
Future Volume (vph)	332	999	15	10	30	1018	415	15	15	20	332	5
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.91	0.91
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.95
Satd. Flow (prot)	1533	3398			1533	3406	1524		1749	1524	2789	1557
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.95
Satd. Flow (perm)	1533	3398			1533	3406	1524		1749	1524	2789	1557
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	377	1135	17	11	34	1157	472	17	17	23	377	6
RTOR Reduction (vph)	0	1	0	0	0	0	330	0	0	22	0	0
Lane Group Flow (vph)	377	1151	0	0	45	1157	142	0	34	1	256	127
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	23.5	48.6			4.2	28.3	28.3		3.4	3.4	22.1	22.1
Effective Green, g (s)	23.5	48.6			4.2	28.3	28.3		3.4	3.4	22.1	22.1
Actuated g/C Ratio	0.25	0.51			0.04	0.30	0.30		0.04	0.04	0.23	0.23
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	379	1738			67	1014	453		62	54	648	362
v/s Ratio Prot	c0.25	0.34			0.03	c0.34			c0.02		c0.09	0.08
v/s Ratio Perm							0.09			0.00		
v/c Ratio	0.99	0.66			0.67	1.14	0.31		0.55	0.02	0.40	0.35
Uniform Delay, d1	35.7	17.1			44.7	33.4	25.8		45.0	44.2	30.8	30.5
Progression Factor	1.00	1.00			1.11	0.72	0.69		1.00	1.00	1.00	1.00
Incremental Delay, d2	44.5	2.0			17.3	74.6	1.6		5.2	0.0	1.8	2.7
Delay (s)	80.2	19.1			66.7	98.5	19.5		50.3	44.2	32.6	33.1
Level of Service	F	B			E	F	B		D	D	C	C
Approach Delay (s)		34.2				75.4			47.8			31.7
Approach LOS		C				E			D			C

Intersection Summary			
HCM 2000 Control Delay	52.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	177
Future Volume (vph)	177
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	201
RTOR Reduction (vph)	154
Lane Group Flow (vph)	47
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	22.1
Effective Green, g (s)	22.1
Actuated g/C Ratio	0.23
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	354
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.13
Uniform Delay, d1	28.9
Progression Factor	1.00
Incremental Delay, d2	0.8
Delay (s)	29.6
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1025	332	250	920	0	0	0	0	190	0	659
Future Volume (vph)	0	1025	332	250	920	0	0	0	0	190	0	659
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6285	1516	1562	3471						1736	2733
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6285	1516	1562	3471						1736	2733
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	1206	391	294	1082	0	0	0	0	224	0	775
RTOR Reduction (vph)	0	0	264	0	0	0	0	0	0	0	0	189
Lane Group Flow (vph)	0	1206	127	294	1082	0	0	0	0	0	224	586
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		30.8	30.8	19.8	54.8						30.5	30.5
Effective Green, g (s)		30.8	30.8	19.8	54.8						30.5	30.5
Actuated g/C Ratio		0.32	0.32	0.21	0.58						0.32	0.32
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2037	491	325	2002						557	877
v/s Ratio Prot		c0.19		c0.19	0.31						0.13	
v/s Ratio Perm			0.08									c0.21
v/c Ratio		0.59	0.26	0.90	0.54						0.40	0.67
Uniform Delay, d1		26.8	23.7	36.7	12.4						25.1	27.9
Progression Factor		0.79	0.93	0.69	0.95						1.00	1.00
Incremental Delay, d2		1.2	1.2	23.8	0.9						0.3	1.8
Delay (s)		22.3	23.1	49.1	12.6						25.5	29.6
Level of Service		C	C	D	B						C	C
Approach Delay (s)		22.5			20.4			0.0			28.7	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	208	1052	25	21	15	1053	306	25	15	25	756	20
Future Volume (vph)	208	1052	25	21	15	1053	306	25	15	25	756	20
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.91	0.91
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (prot)	1577	3491			1577	3505	1568		1788	1568	2870	1605
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.96
Satd. Flow (perm)	1577	3491			1577	3505	1568		1788	1568	2870	1605
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	214	1085	26	22	15	1086	315	26	15	26	779	21
RTOR Reduction (vph)	0	2	0	0	0	0	205	0	0	25	0	0
Lane Group Flow (vph)	214	1109	0	0	37	1086	110	0	41	1	530	270
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	16.1	44.8			3.7	31.4	31.4		4.4	4.4	20.4	20.4
Effective Green, g (s)	16.1	44.8			3.7	31.4	31.4		4.4	4.4	20.4	20.4
Actuated g/C Ratio	0.18	0.50			0.04	0.35	0.35		0.05	0.05	0.23	0.23
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	282	1737			64	1222	547		87	76	650	363
v/s Ratio Prot	c0.14	0.32			0.02	c0.31			c0.02		c0.18	0.17
v/s Ratio Perm							0.07			0.00		
v/c Ratio	0.76	0.64			0.58	0.89	0.20		0.47	0.02	0.82	0.74
Uniform Delay, d1	35.1	16.6			42.4	27.7	20.5		41.7	40.7	33.0	32.4
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	9.9	1.8			7.6	9.8	0.8		1.5	0.0	7.4	7.1
Delay (s)	45.0	18.5			50.0	37.5	21.3		43.1	40.8	40.4	39.4
Level of Service	D	B			D	D	C		D	D	D	D
Approach Delay (s)		22.7				34.3			42.2			37.1
Approach LOS		C				C			D			D

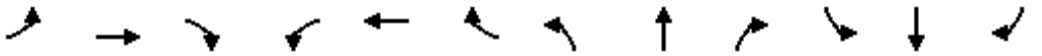
Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	265
Future Volume (vph)	265
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	273
RTOR Reduction (vph)	202
Lane Group Flow (vph)	71
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	20.4
Effective Green, g (s)	20.4
Actuated g/C Ratio	0.23
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	355
v/s Ratio Prot	
v/s Ratio Perm	0.05
v/c Ratio	0.20
Uniform Delay, d1	28.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	28.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1254	590	300	893	0	0	0	0	280	0	632
Future Volume (vph)	0	1254	590	300	893	0	0	0	0	280	0	632
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6346	1532	1577	3505						1752	2760
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6346	1532	1577	3505						1752	2760
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1334	628	319	950	0	0	0	0	298	0	672
RTOR Reduction (vph)	0	0	347	0	0	0	0	0	0	0	0	274
Lane Group Flow (vph)	0	1334	281	319	950	0	0	0	0	0	298	398
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		30.4	30.4	18.8	53.4						15.6	15.6
Effective Green, g (s)		30.4	30.4	18.8	53.4						15.6	15.6
Actuated g/C Ratio		0.39	0.39	0.24	0.68						0.20	0.20
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2451	591	376	2378						347	547
v/s Ratio Prot		c0.21		c0.20	0.27						c0.17	
v/s Ratio Perm			0.18									0.14
v/c Ratio		0.54	0.47	0.85	0.40						0.86	0.73
Uniform Delay, d1		18.8	18.2	28.6	5.6						30.5	29.6
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.8	15.5	0.2						18.4	4.5
Delay (s)		19.1	19.0	44.1	5.7						48.8	34.1
Level of Service		B	B	D	A						D	C
Approach Delay (s)		19.0			15.4			0.0			38.6	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	13.9
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	198	428	377	60	75	157
Future Vol, veh/h	198	428	377	60	75	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	220	476	419	67	83	174

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	486	0	-	0	1368	452
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	916	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1077	-	-	-	162	608
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	390	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1077	-	-	-	129	608
Mov Cap-2 Maneuver	-	-	-	-	129	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	310	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	32.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1077	-	-	-	129	608
HCM Lane V/C Ratio	0.204	-	-	-	0.646	0.287
HCM Control Delay (s)	9.2	-	-	-	73.5	13.3
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0.8	-	-	-	3.4	1.2

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	360	163	128	45	40	289
Future Vol, veh/h	360	163	128	45	40	289
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	125
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	414	187	147	52	46	332

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	199	0	-	0	1188	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	1015	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1373	-	-	-	208	871
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1373	-	-	-	145	871
Mov Cap-2 Maneuver	-	-	-	-	145	-
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	244	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1373	-	-	-	145	871
HCM Lane V/C Ratio	0.301	-	-	-	0.317	0.381
HCM Control Delay (s)	8.7	-	-	-	41	11.7
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	1.3	-	-	-	1.3	1.8

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	220	675	10	24	10	720	330	10	15	15	5	653
Future Volume (vph)	220	675	10	24	10	720	330	10	15	15	5	653
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1710
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00		0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (prot)	1593	3531			1593	3539	1563		1828	1583		1513
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00		0.95
Satd. Flow (perm)	1593	3531			1593	3539	1563		1828	1583		1513
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	703	10	25	10	750	344	10	16	16	5	680
RTOR Reduction (vph)	0	1	0	0	0	0	224	0	0	16	0	0
Lane Group Flow (vph)	229	712	0	0	35	750	120	0	26	0	0	352
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			1				1					
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	Split
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	15.5	44.6			3.4	31.5	31.5		2.4	2.4		22.9
Effective Green, g (s)	15.5	44.6			3.4	31.5	31.5		2.4	2.4		22.9
Actuated g/C Ratio	0.17	0.50			0.04	0.35	0.35		0.03	0.03		0.25
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5		4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2		0.2
Lane Grp Cap (vph)	274	1749			60	1238	547		48	42		384
v/s Ratio Prot	c0.14	0.20			0.02	c0.21			c0.01			c0.23
v/s Ratio Perm							0.08			0.00		
v/c Ratio	0.84	0.41			0.58	0.61	0.22		0.54	0.01		0.92
Uniform Delay, d1	36.0	14.3			42.6	24.1	20.6		43.3	42.6		32.6
Progression Factor	1.00	1.00			1.04	0.96	1.71		1.00	1.00		1.00
Incremental Delay, d2	18.5	0.7			8.3	2.0	0.8		6.5	0.0		25.7
Delay (s)	54.6	15.0			52.7	25.3	36.0		49.8	42.7		58.3
Level of Service	D	B			D	C	D		D	D		E
Approach Delay (s)		24.7				29.4			47.1			
Approach LOS		C				C			D			

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	15	175
Future Volume (vph)	15	175
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.4	4.4
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.95	1.00
Satd. Flow (prot)	1689	1560
Flt Permitted	0.95	1.00
Satd. Flow (perm)	1689	1560
Peak-hour factor, PHF	0.96	0.96
Adj. Flow (vph)	16	182
RTOR Reduction (vph)	0	125
Lane Group Flow (vph)	349	57
Confl. Peds. (#/hr)		2
Confl. Bikes (#/hr)		1
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	22.9	22.9
Effective Green, g (s)	22.9	22.9
Actuated g/C Ratio	0.25	0.25
Clearance Time (s)	4.4	4.4
Vehicle Extension (s)	0.2	0.2
Lane Grp Cap (vph)	429	396
v/s Ratio Prot	0.21	
v/s Ratio Perm		0.04
v/c Ratio	0.81	0.15
Uniform Delay, d1	31.5	26.0
Progression Factor	1.00	1.00
Incremental Delay, d2	10.7	0.1
Delay (s)	42.2	26.0
Level of Service	D	C
Approach Delay (s)	45.3	
Approach LOS	D	

Intersection Summary



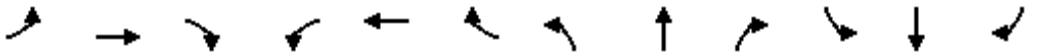
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	362	1129	20	10	40	1163	505	25	25	25	347	15
Future Volume (vph)	362	1129	20	10	40	1163	505	25	25	25	347	15
Ideal Flow (vphpl)	1710	1900	1900	1710	1710	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.91	0.91
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (prot)	1533	3397			1533	3406	1524		1749	1524	2789	1562
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.98	1.00	0.95	0.96
Satd. Flow (perm)	1533	3397			1533	3406	1524		1749	1524	2789	1562
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	393	1227	22	11	43	1264	549	27	27	27	377	16
RTOR Reduction (vph)	0	1	0	0	0	0	339	0	0	26	0	0
Lane Group Flow (vph)	393	1248	0	0	54	1264	210	0	54	2	260	133
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	27.1	51.8			5.4	29.1	29.1		5.0	5.0	11.1	11.1
Effective Green, g (s)	27.1	51.8			5.4	29.1	29.1		5.0	5.0	11.1	11.1
Actuated g/C Ratio	0.30	0.58			0.06	0.32	0.32		0.06	0.06	0.12	0.12
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	461	1955			91	1101	492		97	84	343	192
v/s Ratio Prot	c0.26	0.37			0.04	c0.37			c0.03		c0.09	0.09
v/s Ratio Perm							0.14			0.00		
v/c Ratio	0.85	0.64			0.59	1.15	0.43		0.56	0.02	0.76	0.69
Uniform Delay, d1	29.6	12.8			41.2	30.4	23.9		41.4	40.2	38.2	37.8
Progression Factor	1.00	1.00			1.14	0.63	1.06		1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	1.6			5.3	75.4	2.1		3.9	0.0	8.3	8.4
Delay (s)	43.2	14.4			52.5	94.7	27.4		45.3	40.2	46.4	46.2
Level of Service	D	B			D	F	C		D	D	D	D
Approach Delay (s)		21.3				73.7			43.6			42.5
Approach LOS		C				E			D			D

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	197
Future Volume (vph)	197
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1524
Flt Permitted	1.00
Satd. Flow (perm)	1524
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	214
RTOR Reduction (vph)	188
Lane Group Flow (vph)	26
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	11.1
Effective Green, g (s)	11.1
Actuated g/C Ratio	0.12
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	187
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.14
Uniform Delay, d1	35.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	35.3
Level of Service	D
Approach Delay (s)	
Approach LOS	

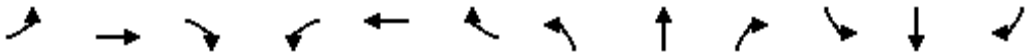
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1160	387	240	1090	0	0	0	0	235	5	774
Future Volume (vph)	0	1160	387	240	1090	0	0	0	0	235	5	774
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6285	1517	1562	3471						1742	2733
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6285	1517	1562	3471						1742	2733
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1261	421	261	1185	0	0	0	0	255	5	841
RTOR Reduction (vph)	0	0	270	0	0	0	0	0	0	0	0	156
Lane Group Flow (vph)	0	1261	151	261	1185	0	0	0	0	0	260	685
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		32.2	32.2	18.1	54.5						25.8	25.8
Effective Green, g (s)		32.2	32.2	18.1	54.5						25.8	25.8
Actuated g/C Ratio		0.36	0.36	0.20	0.61						0.29	0.29
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2248	542	314	2101						499	783
v/s Ratio Prot		0.20		c0.17	c0.34						0.15	
v/s Ratio Perm			0.10									c0.25
v/c Ratio		0.56	0.28	0.83	0.56						0.52	0.87
Uniform Delay, d1		23.2	20.6	34.5	10.6						26.9	30.6
Progression Factor		0.74	1.03	0.88	1.16						1.00	1.00
Incremental Delay, d2		0.8	1.0	12.3	0.8						0.8	10.6
Delay (s)		18.0	22.3	42.7	13.1						27.7	41.2
Level of Service		B	C	D	B						C	D
Approach Delay (s)		19.1			18.4			0.0			38.0	
Approach LOS		B			B			A			D	

Intersection Summary					
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.75				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9		
Intersection Capacity Utilization	77.3%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	601	814	0	0	704	480	611	0	310	0	0	0
Future Volume (vph)	601	814	0	0	704	480	611	0	310	0	0	0
Ideal Flow (vphpl)	1710	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.1			5.1	5.1	4.6	4.6	4.6			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3060	3505			3505	1568	1665	1665	1568			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3060	3505			3505	1568	1665	1665	1568			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	653	885	0	0	765	522	664	0	337	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	254	0	0	125	0	0	0
Lane Group Flow (vph)	653	885	0	0	765	268	332	332	212	0	0	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	22.6	57.8			31.0	31.0	22.5	22.5	22.5			
Effective Green, g (s)	22.6	57.8			31.0	31.0	22.5	22.5	22.5			
Actuated g/C Ratio	0.25	0.64			0.34	0.34	0.25	0.25	0.25			
Clearance Time (s)	4.2	5.1			5.1	5.1	4.6	4.6	4.6			
Vehicle Extension (s)	1.5	4.0			4.0	4.0	3.2	3.2	3.2			
Lane Grp Cap (vph)	768	2250			1207	540	416	416	392			
v/s Ratio Prot	c0.21	0.25			c0.22		c0.20	0.20				
v/s Ratio Perm						0.17			0.14			
v/c Ratio	0.85	0.39			0.63	0.50	0.80	0.80	0.54			
Uniform Delay, d1	32.1	7.7			24.7	23.3	31.6	31.6	29.3			
Progression Factor	0.58	0.13			1.38	2.46	1.00	1.00	1.00			
Incremental Delay, d2	7.9	0.5			1.8	2.3	10.3	10.3	1.6			
Delay (s)	26.6	1.4			35.8	59.8	42.0	42.0	30.9			
Level of Service	C	A			D	E	D	D	C			
Approach Delay (s)		12.1			45.5			38.2			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

LANE SUMMARY

Site: 101 [2040 AM Churn Creek Road and Victor Ave/Rancho Road]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Churn Creek Road NB													
Lane 1[d]	237	3.0	830	0.285	100	7.5	LOS A	1.8	45.2	Full	1100	0.0	0.0
Approach	237	3.0		0.285		7.5	LOS A	1.8	45.2				
East: Rancho Road													
Lane 1[d]	592	3.0	965	0.614	100	12.5	LOS B	5.8	148.9	Full	900	0.0	0.0
Approach	592	3.0		0.614		12.5	LOS B	5.8	148.9				
North: Victor Ave													
Lane 1[d]	329	3.0	637	0.517	100	14.1	LOS B	4.4	112.5	Full	1250	0.0	0.0
Approach	329	3.0		0.517		14.1	LOS B	4.4	112.5				
West: Churn Creek Road EB													
Lane 1[d]	558	3.0	1182	0.472	100	8.1	LOS A	3.8	96.4	Full	500	0.0	0.0
Approach	558	3.0		0.472		8.1	LOS A	3.8	96.4				
Intersection	1716	3.0		0.614		10.7	LOS B	5.8	148.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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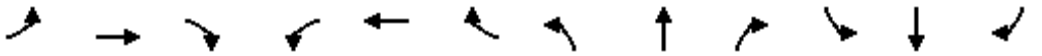


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	10	10	74	10	135	10	435	108	120	312	10
Future Volume (vph)	15	10	10	74	10	135	10	435	108	120	312	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1754			1784	1583	1770	1807		1770	1854	
Flt Permitted		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1754			1784	1583	1770	1807		1770	1854	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	17	11	11	84	11	153	11	494	123	136	355	11
RTOR Reduction (vph)	0	10	0	0	0	134	0	8	0	0	1	0
Lane Group Flow (vph)	0	29	0	0	95	19	11	609	0	136	365	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)		4.2			8.9	8.9	2.0	33.7		7.6	39.3	
Effective Green, g (s)		4.2			8.9	8.9	2.0	33.7		7.6	39.3	
Actuated g/C Ratio		0.06			0.12	0.12	0.03	0.47		0.10	0.54	
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		101			219	194	48	841		185	1006	
v/s Ratio Prot		c0.02			c0.05		0.01	c0.34		c0.08	0.20	
v/s Ratio Perm						0.01						
v/c Ratio		0.28			0.43	0.10	0.23	0.72		0.74	0.36	
Uniform Delay, d1		32.7			29.4	28.2	34.4	15.6		31.4	9.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.5			1.4	0.2	2.4	3.1		14.1	0.2	
Delay (s)		34.2			30.8	28.4	36.9	18.7		45.5	9.6	
Level of Service		C			C	C	D	B		D	A	
Approach Delay (s)		34.2			29.3			19.0			19.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

LANE SUMMARY

Site: 101 [2040 AM Bechelli Lane/Loma Vista Dr]

New Site
Roundabout

Lane Use and Performance	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Bechelli Lane													
Lane 1[d]	601	3.0	1126	0.534	100	9.5	LOS A	4.4	111.6	Full	470	0.0	0.0
Approach	601	3.0		0.534		9.5	LOS A	4.4	111.6				
East: Loma Vista Drive													
Lane 1[d]	238	3.0	814	0.292	100	7.7	LOS A	1.9	47.4	Full	310	0.0	0.0
Approach	238	3.0		0.292		7.7	LOS A	1.9	47.4				
North: Bechelli Lane													
Lane 1[d]	480	3.0	1176	0.409	100	7.2	LOS A	3.1	80.4	Full	495	0.0	0.0
Approach	480	3.0		0.409		7.2	LOS A	3.1	80.4				
West: Loma Vista Drive													
Lane 1[d]	38	3.0	799	0.048	100	5.0	LOS A	0.3	6.6	Full	275	0.0	0.0
Approach	38	3.0		0.048		5.0	LOS A	0.3	6.6				
Intersection	1358	3.0		0.534		8.2	LOS A	4.4	111.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	258	1232	25	21	30	1158	431	30	25	40	901	15
Future Volume (vph)	258	1232	25	21	30	1158	431	30	25	40	901	15
Ideal Flow (vphpl)	1710	1900	1900	1710	1900	1900	1900	1900	1900	1900	1710	1900
Total Lost time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00		1.00	1.00	0.91	0.91
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	1.00			1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (prot)	1577	3493			1752	3505	1568		1796	1568	2870	1602
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.97	1.00	0.95	0.95
Satd. Flow (perm)	1577	3493			1752	3505	1568		1796	1568	2870	1602
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	266	1270	26	22	31	1194	444	31	26	41	929	15
RTOR Reduction (vph)	0	1	0	0	0	0	290	0	0	39	0	0
Lane Group Flow (vph)	266	1295	0	0	53	1194	154	0	57	2	632	312
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases							6			3		
Actuated Green, G (s)	18.4	43.6			4.9	29.1	29.1		5.0	5.0	19.8	19.8
Effective Green, g (s)	18.4	43.6			4.9	29.1	29.1		5.0	5.0	19.8	19.8
Actuated g/C Ratio	0.20	0.48			0.05	0.32	0.32		0.06	0.06	0.22	0.22
Clearance Time (s)	4.5	5.3			3.5	5.3	5.3		3.5	3.5	4.4	4.4
Vehicle Extension (s)	1.5	1.5			0.2	1.5	1.5		0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	322	1692			95	1133	506		99	87	631	352
v/s Ratio Prot	c0.17	0.37			0.03	c0.34			c0.03		c0.22	0.19
v/s Ratio Perm							0.10			0.00		
v/c Ratio	0.83	0.77			0.56	1.05	0.30		0.58	0.03	1.00	0.89
Uniform Delay, d1	34.3	19.0			41.5	30.4	22.8		41.5	40.2	35.1	34.0
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	15.1	3.4			4.0	42.1	1.5		5.0	0.0	36.2	21.9
Delay (s)	49.3	22.4			45.5	72.6	24.4		46.4	40.2	71.3	55.9
Level of Service	D	C			D	E	C		D	D	E	E
Approach Delay (s)		27.0				59.1			43.8			56.0
Approach LOS		C				E			D			E

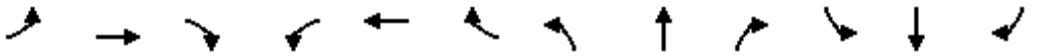
Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	345
Future Volume (vph)	345
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	356
RTOR Reduction (vph)	278
Lane Group Flow (vph)	78
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	19.8
Effective Green, g (s)	19.8
Actuated g/C Ratio	0.22
Clearance Time (s)	4.4
Vehicle Extension (s)	0.2
Lane Grp Cap (vph)	344
v/s Ratio Prot	
v/s Ratio Perm	0.05
v/c Ratio	0.23
Uniform Delay, d1	28.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	28.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1459	710	340	1018	0	0	0	0	285	0	707
Future Volume (vph)	0	1459	710	340	1018	0	0	0	0	285	0	707
Ideal Flow (vphpl)	1900	1900	1900	1710	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Lane Util. Factor		0.86	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		6346	1532	1577	3505						1752	2760
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		6346	1532	1577	3505						1752	2760
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1552	755	362	1083	0	0	0	0	303	0	752
RTOR Reduction (vph)	0	0	317	0	0	0	0	0	0	0	0	218
Lane Group Flow (vph)	0	1552	438	362	1083	0	0	0	0	0	303	534
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		35.8	35.8	20.9	60.9						15.5	15.5
Effective Green, g (s)		35.8	35.8	20.9	60.9						15.5	15.5
Actuated g/C Ratio		0.42	0.42	0.24	0.71						0.18	0.18
Clearance Time (s)		5.1	5.1	4.2	5.1						4.6	4.6
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.5	2.5
Lane Grp Cap (vph)		2638	636	382	2479						315	496
v/s Ratio Prot		0.24		c0.23	0.31						0.17	
v/s Ratio Perm			c0.29									c0.19
v/c Ratio		0.59	0.69	0.95	0.44						0.96	1.08
Uniform Delay, d1		19.5	20.6	32.1	5.3						35.0	35.3
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	3.4	32.2	0.2						40.3	62.5
Delay (s)		19.9	24.0	64.2	5.5						75.3	97.8
Level of Service		B	C	E	A						E	F
Approach Delay (s)		21.2			20.2			0.0			91.3	
Approach LOS		C			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	13.9
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	756	65	0	684	90	15
Future Vol, veh/h	756	65	0	684	90	15
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	125
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	796	68	0	720	95	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	865	0	1551	831
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	720	-
Critical Hdwy	-	-	4.14	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.236	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	770	-	124	366
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	478	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	770	-	124	366
Mov Cap-2 Maneuver	-	-	-	-	261	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	478	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	24.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	261	366	-	-	770	-
HCM Lane V/C Ratio	0.363	0.043	-	-	-	-
HCM Control Delay (s)	26.4	15.3	-	-	0	-
HCM Lane LOS	D	C	-	-	A	-
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0	-

LANE SUMMARY

Site: 101 [2040 PM Churn Creek Road and Victor Ave/Rancho Road]

New Site
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Churn Creek Road NB													
Lane 1[d]	242	3.0	578	0.419	100	12.8	LOS B	3.2	81.5	Full	1100	0.0	0.0
Approach	242	3.0		0.419		12.8	LOS B	3.2	81.5				
East: Rancho Road													
Lane 1[d]	455	3.0	885	0.515	100	10.9	LOS B	4.1	104.2	Full	900	0.0	0.0
Approach	455	3.0		0.515		10.9	LOS B	4.1	104.2				
North: Victor Ave													
Lane 1[d]	355	3.0	768	0.463	100	11.0	LOS B	3.5	89.6	Full	1250	0.0	0.0
Approach	355	3.0		0.463		11.0	LOS B	3.5	89.6				
West: Churn Creek Road EB													
Lane 1[d]	860	3.0	1113	0.772	100	17.1	LOS B	10.7	274.9	Full	500	0.0	0.0
Approach	860	3.0		0.772		17.1	LOS B	10.7	274.9				
Intersection	1913	3.0		0.772		13.9	LOS B	10.7	274.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	10	10	94	10	60	10	427	69	115	707	20
Future Volume (vph)	15	10	10	94	10	60	10	427	69	115	707	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		0.95	0.95		0.95	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.95		1.00	0.98		1.00	1.00	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1754			1706		1681	1733		1681	1760	
Flt Permitted		0.98			0.97		0.95	1.00		0.95	0.99	
Satd. Flow (perm)		1754			1706		1681	1732		1681	1751	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	17	11	11	107	11	68	11	485	78	131	803	23
RTOR Reduction (vph)	0	10	0	0	21	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	29	0	0	165	0	10	561	0	118	839	0
Confl. Peds. (#/hr)				2		2				2		2
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		4.2			12.1		1.1	32.3		8.9	40.1	
Effective Green, g (s)		4.2			12.1		1.1	32.3		8.9	40.1	
Actuated g/C Ratio		0.06			0.16		0.01	0.43		0.12	0.53	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		97			273		24	740		198	931	
v/s Ratio Prot		c0.02			c0.10		0.01	c0.01		0.07	c0.11	
v/s Ratio Perm								0.31			c0.37	
v/c Ratio		0.29			0.60		0.42	0.76		0.60	0.90	
Uniform Delay, d1		34.2			29.5		36.9	18.3		31.6	15.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7			3.7		11.3	4.5		4.8	11.7	
Delay (s)		35.9			33.2		48.2	22.7		36.4	27.6	
Level of Service		D			C		D	C		D	C	
Approach Delay (s)		35.9			33.2			23.2			28.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

LANE SUMMARY

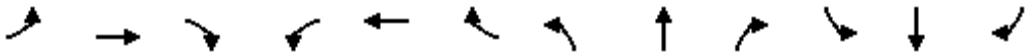
Site: 101 [2040 PM Bechelli Lane/Loma Vista Dr]

New Site
Roundabout

Lane Use and Performance	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Bechelli Lane													
Lane 1[d]	550	3.0	1115	0.493	100	8.8	LOS A	4.1	104.6	Full	470	0.0	0.0
Approach	550	3.0		0.493		8.8	LOS A	4.1	104.6				
East: Loma Vista Drive													
Lane 1[d]	178	3.0	821	0.217	100	6.7	LOS A	1.3	33.6	Full	310	0.0	0.0
Approach	178	3.0		0.217		6.7	LOS A	1.3	33.6				
North: Bechelli Lane													
Lane 1[d]	915	3.0	1151	0.795	100	18.0	LOS B	11.3	289.4	Full	495	0.0	0.0
Approach	915	3.0		0.795		18.0	LOS B	11.3	289.4				
West: Loma Vista Drive													
Lane 1[d]	38	3.0	410	0.093	100	10.1	LOS B	0.6	16.2	Full	275	0.0	0.0
Approach	38	3.0		0.093		10.1	LOS B	0.6	16.2				
Intersection	1682	3.0		0.795		13.6	LOS B	11.3	289.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	490	15	5	580	40	5	0	20	65	0	30
Future Volume (Veh/h)	30	490	15	5	580	40	5	0	20	65	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	32	527	16	5	624	43	5	0	22	70	0	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	667			543			1286	1276	535	1276	1262	646
vC1, stage 1 conf vol							599	599		656	656	
vC2, stage 2 conf vol							688	677		621	607	
vCu, unblocked vol	667			543			1286	1276	535	1276	1262	646
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			98	100	96	79	100	93
cM capacity (veh/h)	923			1026			309	340	545	332	354	472

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	575	672	27	102
Volume Left	32	5	5	70
Volume Right	16	43	22	32
cSH	923	1026	478	366
Volume to Capacity	0.03	0.00	0.06	0.28
Queue Length 95th (ft)	3	0	4	28
Control Delay (s)	0.9	0.1	13.0	18.6
Lane LOS	A	A	B	C
Approach Delay (s)	0.9	0.1	13.0	18.6
Approach LOS			B	C

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

LANE SUMMARY

Site: 101 [2040 SAT Churn Creek Road and Victor Ave/Rancho Road]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Churn Creek Road NB													
Lane 1[d]	207	3.0	863	0.239	100	6.7	LOS A	1.4	36.8	Full	1100	0.0	0.0
Approach	207	3.0		0.239		6.7	LOS A	1.4	36.8				
East: Rancho Road													
Lane 1[d]	364	3.0	954	0.382	100	8.0	LOS A	2.5	63.7	Full	900	0.0	0.0
Approach	364	3.0		0.382		8.0	LOS A	2.5	63.7				
North: Victor Ave													
Lane 1[d]	315	3.0	846	0.372	100	8.6	LOS A	2.5	62.8	Full	1250	0.0	0.0
Approach	315	3.0		0.372		8.6	LOS A	2.5	62.8				
West: Churn Creek Road EB													
Lane 1[d]	571	3.0	1177	0.485	100	8.3	LOS A	4.0	103.6	Full	500	0.0	0.0
Approach	571	3.0		0.485		8.3	LOS A	4.0	103.6				
Intersection	1457	3.0		0.485		8.1	LOS A	4.0	103.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	UL	T	T	R	LT	R	L	L
Maximum Queue (ft)	312	368	200	151	190	349	364	265	110	77	146	150
Average Queue (ft)	188	103	60	57	56	212	230	117	38	22	74	80
95th Queue (ft)	290	249	152	126	152	332	351	212	89	62	123	130
Link Distance (ft)		503	503			298	298	298	165		274	274
Upstream Blk Time (%)		0				2	4	0	0			
Queuing Penalty (veh)		0				13	21	1	0			
Storage Bay Dist (ft)	200			200	140					30		
Storage Blk Time (%)	8	0	0		0	21			36	5		
Queuing Penalty (veh)	30	0	0		0	10			9	3		

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	SB	SB	B1	B1
Directions Served	LT	R	T	T
Maximum Queue (ft)	158	152	48	43
Average Queue (ft)	76	64	5	29
95th Queue (ft)	136	117	27	44
Link Distance (ft)	274	274	71	71
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	T	T	TR	LT	T	TR	R	R
Maximum Queue (ft)	5	5	14	128	126	44	64	127
Average Queue (ft)	0	0	1	33	11	3	23	45
95th Queue (ft)	4	4	9	97	61	22	50	95
Link Distance (ft)	298	298	298	321	321	321	58	179
Upstream Blk Time (%)							0	0
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	TR	L	L	T	T	LT	R	R
Maximum Queue (ft)	165	233	236	285	109	110	150	232	230	378	338
Average Queue (ft)	63	107	109	117	52	53	67	90	107	179	135
95th Queue (ft)	134	180	195	221	96	100	142	185	185	305	264
Link Distance (ft)	321	321	321	321	380	380	380	380		726	
Upstream Blk Time (%)		0		0							
Queuing Penalty (veh)		0		0							
Storage Bay Dist (ft)									400		400
Storage Blk Time (%)										0	0
Queuing Penalty (veh)										2	0

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LT	R
Maximum Queue (ft)	335	347	329	284	231	224	225	333	424	329
Average Queue (ft)	151	146	111	68	161	133	166	175	242	112
95th Queue (ft)	249	260	228	168	241	218	258	306	361	251
Link Distance (ft)	380	380	380	380	210	210	210		679	
Upstream Blk Time (%)	0	0	0	0	3	1	3			
Queuing Penalty (veh)	0	0	0	0	12	3	14			
Storage Bay Dist (ft)								400		450
Storage Blk Time (%)									0	1
Queuing Penalty (veh)									1	4

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	T	R	L	TR
Maximum Queue (ft)	187	209	259	183	62	117	217	211	302	262	224	163
Average Queue (ft)	150	164	117	65	18	55	107	78	145	66	146	61
95th Queue (ft)	211	228	266	135	48	112	191	157	256	170	238	137
Link Distance (ft)			210	210			315	315	315		198	198
Upstream Blk Time (%)		5	6	0				0	1		16	1
Queuing Penalty (veh)		0	34	0				0	2		0	0
Storage Bay Dist (ft)	130	130			115	75				200		
Storage Blk Time (%)	19	30	1	1		9	20		5			
Queuing Penalty (veh)	44	69	5	2		21	13		9			

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	R	R
Maximum Queue (ft)	117	132	64	111	185
Average Queue (ft)	44	62	17	49	80
95th Queue (ft)	97	113	46	94	145
Link Distance (ft)		557	557		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	275			300	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	TR	LT	TR	L	R
Maximum Queue (ft)	50	20	21	52	73	35	96
Average Queue (ft)	19	1	1	4	4	10	43
95th Queue (ft)	46	12	13	27	42	29	80
Link Distance (ft)		315	315	582	582	124	124
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	75						
Storage Blk Time (%)		0					
Queuing Penalty (veh)		0					

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	R	L	T	TR
Maximum Queue (ft)	44	34	26	38	20	154	164	27	65	71	82
Average Queue (ft)	10	9	6	6	4	73	51	3	25	25	29
95th Queue (ft)	35	32	23	24	17	123	122	16	53	57	65
Link Distance (ft)	192		299	299		220	220	220		496	
Upstream Blk Time (%)							0				
Queuing Penalty (veh)							0				
Storage Bay Dist (ft)		35			60				125		55
Storage Blk Time (%)	5	1		0					0	1	1
Queuing Penalty (veh)	1	0		0					0	2	3

Intersection: 23: Churn Creek Rd & Public Row to Chevron

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	TR	L	T	TR
Maximum Queue (ft)	80	69	122	77	136	210	229	56	102	229
Average Queue (ft)	33	15	54	22	59	87	111	19	41	110
95th Queue (ft)	66	48	99	59	108	181	208	46	81	196
Link Distance (ft)		183		239		557	557		769	769
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	40		125		145			180		
Storage Blk Time (%)	8	1	0		0	2				
Queuing Penalty (veh)	2	1	0		1	2				

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	59	14
Average Queue (ft)	23	1
95th Queue (ft)	51	7
Link Distance (ft)	170	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	WB	NB	NB
Directions Served	L	R	T	TR
Maximum Queue (ft)	158	59	7	4
Average Queue (ft)	65	28	0	0
95th Queue (ft)	119	52	6	3
Link Distance (ft)	238	238	71	71
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 335

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	UL	T	T	R	LT	R	L	L
Maximum Queue (ft)	244	238	201	211	214	387	388	240	118	80	283	332
Average Queue (ft)	145	120	106	102	74	262	278	92	48	37	174	200
95th Queue (ft)	228	205	179	182	194	396	407	175	105	79	262	294
Link Distance (ft)		504	504			298	298	298	165		271	271
Upstream Blk Time (%)						10	14	0	0		0	2
Queuing Penalty (veh)						55	73	1	0		1	6
Storage Bay Dist (ft)	200			200	140					30		
Storage Blk Time (%)	3	1	0	0	0	37			45	17		
Queuing Penalty (veh)	11	1	1	1	1	19			18	9		

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	SB	SB	B1	B1	B1
Directions Served	LT	R	T	T	T
Maximum Queue (ft)	300	235	38	66	54
Average Queue (ft)	205	113	2	18	31
95th Queue (ft)	288	200	19	54	48
Link Distance (ft)	271	271	74	74	74
Upstream Blk Time (%)	2	0		0	0
Queuing Penalty (veh)	6	0		0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	T	T	TR	T	T	TR	R	R
Maximum Queue (ft)	71	177	260	168	189	91	60	150
Average Queue (ft)	3	12	52	20	25	6	23	55
95th Queue (ft)	45	98	194	109	122	61	52	124
Link Distance (ft)	298	298	298	321	321	321	58	179
Upstream Blk Time (%)		0	0			0	1	1
Queuing Penalty (veh)		0	2			0	0	0
Storage Bay Dist (ft)								
Storage Blk Time (%)	0							
Queuing Penalty (veh)	0							

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	TR	UL	L	T	T	LT	R	R
Maximum Queue (ft)	238	281	297	345	142	139	149	190	314	299	268
Average Queue (ft)	111	155	168	257	75	74	59	81	161	162	122
95th Queue (ft)	197	246	272	386	136	135	133	174	269	259	225
Link Distance (ft)	321	321	321	321	380	380	380	380		726	
Upstream Blk Time (%)		0	0	5							
Queuing Penalty (veh)		0	0	29							
Storage Bay Dist (ft)									400		400
Storage Blk Time (%)										0	
Queuing Penalty (veh)										0	

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	
Directions Served	L	L	T	T	T	T	R	L	LT	R	
Maximum Queue (ft)	354	367	368	316	236	245	225	384	486	502	
Average Queue (ft)	180	192	132	84	221	201	118	139	207	153	
95th Queue (ft)	303	327	297	215	257	263	211	312	370	367	
Link Distance (ft)	380	380	380	380	210	210	210		679		
Upstream Blk Time (%)	0	0	1	0	18	9	1		1		
Queuing Penalty (veh)	0	2	4	0	80	39	3		0		
Storage Bay Dist (ft)								400		450	
Storage Blk Time (%)									0	4	
Queuing Penalty (veh)									0	17	

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	T	R	L	TR
Maximum Queue (ft)	187	209	259	209	130	125	315	284	198	116	206	95
Average Queue (ft)	149	167	142	101	9	55	192	148	85	53	129	31
95th Queue (ft)	207	228	275	185	53	132	335	288	158	99	229	69
Link Distance (ft)			210	210			315	315	315		198	198
Upstream Blk Time (%)		6	10	0			6	0			16	
Queuing Penalty (veh)		0	61	3			16	0			0	
Storage Bay Dist (ft)	130	130			115	75				200		
Storage Blk Time (%)	22	35	2	5		7	55		0			
Queuing Penalty (veh)	78	125	11	4		15	19		0			

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	R	R
Maximum Queue (ft)	149	151	42	185	192
Average Queue (ft)	53	69	10	93	102
95th Queue (ft)	113	123	31	161	172
Link Distance (ft)		557	557		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	275			300	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	LT	TR	LTR	L	R
Maximum Queue (ft)	64	12	81	43	47	51	87
Average Queue (ft)	30	0	15	3	14	14	36
95th Queue (ft)	60	9	85	35	40	39	68
Link Distance (ft)		315	582	582	90	124	124
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	0						
Queuing Penalty (veh)	1						

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	R	L	T	TR
Maximum Queue (ft)	96	90	147	132	53	48	226	68	86	151	158
Average Queue (ft)	38	32	62	59	10	14	125	32	37	71	77
95th Queue (ft)	75	68	118	111	40	38	213	59	71	125	135
Link Distance (ft)	193		298	298		225	225	225		496	
Upstream Blk Time (%)							1				
Queuing Penalty (veh)							1				
Storage Bay Dist (ft)		35			60				125		55
Storage Blk Time (%)	27	10		8					0	9	11
Queuing Penalty (veh)	19	6		2					0	37	45

Intersection: 23: Churn Creek Rd & Public Row to Chevron

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	TR	L	T	TR
Maximum Queue (ft)	81	98	148	237	127	256	292	64	190	332
Average Queue (ft)	35	34	94	47	61	106	127	27	78	162
95th Queue (ft)	70	75	149	122	106	206	242	57	147	279
Link Distance (ft)		183		239		557	557		769	769
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	40		125		145			180		
Storage Blk Time (%)	11	6	4	0	0	3			0	
Queuing Penalty (veh)	5	3	3	0	0	3			0	

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	89	33	15
Average Queue (ft)	36	3	1
95th Queue (ft)	68	18	12
Link Distance (ft)	170		411
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		1	

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	WB	NB	NB
Directions Served	L	R	T	TR
Maximum Queue (ft)	140	50	28	7
Average Queue (ft)	63	19	2	0
95th Queue (ft)	108	46	21	4
Link Distance (ft)	239	239	74	74
Upstream Blk Time (%)	0		0	
Queuing Penalty (veh)	0		0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 839

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	TR	UL	T	T	R	LT	R	UL	L
Maximum Queue (ft)	279	231	170	90	98	235	246	193	85	74	243	251
Average Queue (ft)	155	84	50	32	36	130	147	85	26	18	135	147
95th Queue (ft)	249	178	119	78	79	208	230	157	64	51	207	218
Link Distance (ft)		504	504			298	298	298	165		256	256
Upstream Blk Time (%)						0	0				0	0
Queuing Penalty (veh)						0	0				0	0
Storage Bay Dist (ft)	200			200	140					30		
Storage Blk Time (%)	4	0	0			6			26	4		
Queuing Penalty (veh)	12	1	0			2			5	1		

Intersection: 5: Bechelli Lane & S Bonnyview Rd

Movement	SB	SB	B1	B1	B1
Directions Served	LT	R	T	T	T
Maximum Queue (ft)	244	126	8	55	46
Average Queue (ft)	137	54	0	10	31
95th Queue (ft)	216	102	6	39	48
Link Distance (ft)	256	256	79	79	79
Upstream Blk Time (%)	0			0	
Queuing Penalty (veh)	0			0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	WB	WB	WB	NB	SB
Directions Served	T	ULT	T	TR	R	R
Maximum Queue (ft)	5	121	59	44	68	109
Average Queue (ft)	0	36	5	3	25	48
95th Queue (ft)	4	91	39	21	53	83
Link Distance (ft)	298	321	321	321	58	179
Upstream Blk Time (%)					1	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: S Bonnyview Rd & I-5 SB Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	TR	UL	L	T	T	LT	R	R
Maximum Queue (ft)	171	212	214	231	117	117	162	183	145	214	172
Average Queue (ft)	71	106	93	98	51	49	40	81	69	105	86
95th Queue (ft)	147	182	174	205	97	96	108	161	127	183	146
Link Distance (ft)	321	321	321	321	380	380	380	380		726	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)									400		400
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 8: I-5 NB Ramps & S Bonnyview Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	
Directions Served	L	L	T	T	T	T	R	L	LT	R	
Maximum Queue (ft)	340	342	306	238	228	231	178	228	291	231	
Average Queue (ft)	170	176	100	51	165	146	78	72	161	73	
95th Queue (ft)	285	297	225	147	239	225	161	184	245	152	
Link Distance (ft)	380	380	380	380	210	210	210		679		
Upstream Blk Time (%)	0	0	0		3	1	0				
Queuing Penalty (veh)	1	1	0		9	3	1				
Storage Bay Dist (ft)								400		450	
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	T	R	L	TR
Maximum Queue (ft)	187	205	231	142	22	63	166	142	159	85	74	89
Average Queue (ft)	123	140	67	44	2	19	79	63	54	39	28	33
95th Queue (ft)	194	205	184	102	12	53	144	126	120	75	64	68
Link Distance (ft)			210	210			315	315	315		198	198
Upstream Blk Time (%)		2	2									
Queuing Penalty (veh)		0	10									
Storage Bay Dist (ft)	130	130			115	75				200		
Storage Blk Time (%)	6	16	1	0		0	12		0			
Queuing Penalty (veh)	15	37	3	0		0	2		0			

Intersection: 9: Churn Creek Rd & S Bonnyview Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	R	R
Maximum Queue (ft)	91	102	77	122	152
Average Queue (ft)	30	47	23	43	57
95th Queue (ft)	72	87	58	88	112
Link Distance (ft)		557	557		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	275			300	300
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 10: Churn Creek Rd & Alrose Lane

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	LT	TR	LTR	L	R
Maximum Queue (ft)	71	8	9	45	37	70
Average Queue (ft)	25	0	0	12	10	34
95th Queue (ft)	56	6	5	37	31	57
Link Distance (ft)		582	582	90	124	124
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75					
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	L	T	R	L	T	TR
Maximum Queue (ft)	42	30	141	129	35	41	188	95	87	102	86
Average Queue (ft)	8	9	69	52	10	9	84	41	39	34	27
95th Queue (ft)	31	31	122	103	28	30	150	76	76	76	65
Link Distance (ft)	193		298	298		238	238	238		496	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		35			60				125		55
Storage Blk Time (%)	4	1		5	0					2	1
Queuing Penalty (veh)	0	0		2	0					5	3

Intersection: 23: Churn Creek Rd & Public Row to Chevron

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	TR	L	T	TR
Maximum Queue (ft)	75	93	149	216	161	232	251	81	154	248
Average Queue (ft)	35	39	102	49	70	99	121	35	56	119
95th Queue (ft)	68	76	151	121	128	192	224	70	112	207
Link Distance (ft)		183		239		557	557		769	769
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	40		125		145			180		
Storage Blk Time (%)	10	7	4	0	1	3				
Queuing Penalty (veh)	6	4	4	0	2	3				

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	94	32
Average Queue (ft)	38	5
95th Queue (ft)	67	22
Link Distance (ft)	170	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	WB	NB
Directions Served	L	R	TR
Maximum Queue (ft)	178	62	4
Average Queue (ft)	80	29	0
95th Queue (ft)	142	55	4
Link Distance (ft)	238	238	79
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 133

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	WB	WB	NB	SB
Directions Served	L	T	T	TR	R	R
Maximum Queue (ft)	60	145	125	35	64	114
Average Queue (ft)	15	19	22	2	20	47
95th Queue (ft)	44	103	105	15	50	102
Link Distance (ft)		323	323	323	63	218
Upstream Blk Time (%)					0	0
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)	50					
Storage Blk Time (%)	1	3				
Queuing Penalty (veh)	4	1				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	44	31	77	83	26	187	177	24	69	87	123
Average Queue (ft)	7	6	32	38	4	97	70	4	25	32	43
95th Queue (ft)	30	26	63	69	19	162	140	17	57	68	90
Link Distance (ft)	193	193	333	333			349	349		398	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)					125	290			125		55
Storage Blk Time (%)										2	4
Queuing Penalty (veh)										5	9

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	51	13
Average Queue (ft)	20	1
95th Queue (ft)	46	8
Link Distance (ft)	257	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB
Directions Served	R
Maximum Queue (ft)	65
Average Queue (ft)	32
95th Queue (ft)	54
Link Distance (ft)	236
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 18

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	WB	WB	WB	WB	NB	SB
Directions Served	T	TR	L	T	T	TR	R	R
Maximum Queue (ft)	31	69	30	44	49	19	61	92
Average Queue (ft)	1	3	3	3	4	1	20	35
95th Queue (ft)	19	36	17	32	38	9	48	69
Link Distance (ft)	299	299		330	330	330	58	168
Upstream Blk Time (%)							1	
Queuing Penalty (veh)							0	
Storage Bay Dist (ft)			50					
Storage Blk Time (%)				0				
Queuing Penalty (veh)				0				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	86	87	158	190	97	100	209	68	91	165	169
Average Queue (ft)	36	33	79	84	11	44	95	31	41	72	77
95th Queue (ft)	70	66	132	149	47	83	171	57	80	135	143
Link Distance (ft)	193		298	298			366	366		496	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	24	11		15	0		0		0	11	13
Queuing Penalty (veh)	15	5		3	0		0		0	37	42

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	71	23
Average Queue (ft)	34	2
95th Queue (ft)	58	14
Link Distance (ft)	170	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	SB	SB
Directions Served	R	TR	T	T
Maximum Queue (ft)	67	10	254	270
Average Queue (ft)	31	0	64	44
95th Queue (ft)	52	6	223	196
Link Distance (ft)	237	282	366	366
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	2
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 104

Intersection: 6: Texaco Dwy/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	R	R
Maximum Queue (ft)	50	3	40	70	90
Average Queue (ft)	18	0	2	22	41
95th Queue (ft)	44	3	19	50	72
Link Distance (ft)		323	323	63	242
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	50				
Storage Blk Time (%)	1				
Queuing Penalty (veh)	2				

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	38	34	160	183	96	82	166	83	96	78	80
Average Queue (ft)	11	9	74	94	17	35	70	34	40	29	30
95th Queue (ft)	36	32	129	157	60	69	130	64	75	65	66
Link Distance (ft)	193		292	292			358	358		523	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	6	1		16	0				0	1	2
Queuing Penalty (veh)	1	0		5	0				0	3	4

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	71	27
Average Queue (ft)	35	2
95th Queue (ft)	59	14
Link Distance (ft)	152	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	62	5
Average Queue (ft)	29	0
95th Queue (ft)	50	6
Link Distance (ft)	233	281
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 16

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	T	T	TR	LT	T	TR	R	R
Maximum Queue (ft)	3	3	4	140	143	53	64	122
Average Queue (ft)	0	0	0	38	12	3	20	49
95th Queue (ft)	3	3	3	108	72	24	49	99
Link Distance (ft)	298	298	298	321	321	321	58	179
Upstream Blk Time (%)							0	0
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	42	30	88	92	20	190	241	22	62	108	112
Average Queue (ft)	12	7	36	35	4	102	94	5	27	42	48
95th Queue (ft)	37	29	71	71	16	167	186	18	58	85	95
Link Distance (ft)	193		298	298			332	332		496	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	6	1		2			0			4	5
Queuing Penalty (veh)	1	0		0			0			10	10

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	65	22
Average Queue (ft)	23	1
95th Queue (ft)	52	10
Link Distance (ft)	170	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB
Directions Served	R
Maximum Queue (ft)	89
Average Queue (ft)	38
95th Queue (ft)	69
Link Distance (ft)	237
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 21

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	T	T	TR	LT	T	TR	R	R
Maximum Queue (ft)	43	83	208	144	120	54	62	147
Average Queue (ft)	1	4	40	23	15	3	24	48
95th Queue (ft)	27	42	146	99	79	24	55	110
Link Distance (ft)	298	298	298	321	321	321	58	179
Upstream Blk Time (%)							1	1
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	102	89	183	181	79	106	248	72	96	184	197
Average Queue (ft)	41	34	86	94	10	48	122	28	39	94	102
95th Queue (ft)	80	67	151	162	42	93	215	53	75	163	171
Link Distance (ft)	193		298	298			332	332		496	
Upstream Blk Time (%)							0				
Queuing Penalty (veh)							0				
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	27	13		20			0		0	17	20
Queuing Penalty (veh)	19	8		4			0		0	74	82

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	91	23
Average Queue (ft)	39	2
95th Queue (ft)	73	13
Link Distance (ft)	170	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB	NB	SB	SB
Directions Served	R	T	TR	T	T
Maximum Queue (ft)	75	12	12	62	56
Average Queue (ft)	32	0	0	10	11
95th Queue (ft)	59	9	7	105	101
Link Distance (ft)	237	307	307	332	332
Upstream Blk Time (%)				0	0
Queuing Penalty (veh)				1	1
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 189

Intersection: 6: Texaco Dwy #2/Project Driveway #4 & S Bonnyview Rd

Movement	WB	WB	WB	NB	SB
Directions Served	ULT	T	TR	R	R
Maximum Queue (ft)	115	91	46	56	114
Average Queue (ft)	33	4	4	22	48
95th Queue (ft)	86	38	23	47	85
Link Distance (ft)	321	321	321	58	179
Upstream Blk Time (%)				0	0
Queuing Penalty (veh)				0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 18: Bechelli Lane & Blue Shield Dwy/Project Driveway #1

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	R	L	T	TR
Maximum Queue (ft)	38	30	208	191	68	90	196	88	102	107	98
Average Queue (ft)	8	8	94	80	12	38	95	37	41	45	36
95th Queue (ft)	31	29	166	151	41	73	167	70	81	84	75
Link Distance (ft)	193		298	298			332	332		496	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		35			60	290			125		55
Storage Blk Time (%)	5	1		11	0				0	4	3
Queuing Penalty (veh)	0	0		3	0				0	11	8

Intersection: 28: Bechelli Lane & Project Driveway #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	102	31
Average Queue (ft)	41	5
95th Queue (ft)	75	22
Link Distance (ft)	170	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 29: Bechelli Lane & Project Driveway #3

Movement	WB	NB
Directions Served	R	TR
Maximum Queue (ft)	66	5
Average Queue (ft)	34	0
95th Queue (ft)	58	4
Link Distance (ft)	237	307
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 23

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	41.7	62.5	0.18	10.4	F
E Bonnyview Rd	II	40	33.6	51.3	84.9	0.34	14.4	E
	II	50	55.9	5.8	61.7	0.78	45.3	A
Bechelli Lane	II	45	37.8	12.8	50.6	0.40	28.6	B
	II	35	19.2	12.9	32.1	0.15	17.2	D
I-5 NB Ramps	II	35	11.5	4.9	16.4	0.09	20.1	D
Churn Creek Rd	II	35	7.9	21.6	29.5	0.06	7.7	F
Total	II		186.7	151.0	337.7	2.01	21.4	D

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	28.2	36.1	0.06	6.3	F
I-5 SB Ramps	II	35	11.5	13.4	24.9	0.09	13.3	E
Bechelli Lane	II	35	19.2	94.8	114.0	0.15	4.9	F
Indianwood Dr	II	50	34.6	5.5	40.1	0.40	36.1	A
E Bonnyview Rd	II	50	55.9	28.7	84.6	0.78	33.0	B
Eastside Rd	II	40	33.6	25.5	59.1	0.34	20.7	D
State Route 273	II	40	20.8	40.9	61.7	0.18	10.6	F
Total	II		183.5	237.0	420.5	2.01	17.2	D

Arterial Level of Service: EB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Eastside Rd	II	40	20.8	42.2	63.0	0.18	10.3	F
E Bonnyview Rd	II	40	33.3	28.7	62.0	0.34	19.6	D
	II	50	55.9	8.6	64.5	0.78	43.3	A
Bechelli Lane	II	45	37.8	12.0	49.8	0.40	29.1	B
	II	35	19.2	16.9	36.1	0.15	15.3	E
I-5 NB Ramps	II	35	11.5	10.0	21.5	0.09	15.3	E
Churn Creek Rd	II	35	7.9	20.9	28.8	0.06	7.9	F
Total	II		186.4	139.3	325.7	2.00	22.2	C

Arterial Level of Service: WB S Bonnyview Rd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
	II	35	7.9	52.3	60.2	0.06	3.8	F
I-5 SB Ramps	II	35	11.5	6.5	18.0	0.09	18.3	D
Bechelli Lane	II	35	19.2	66.9	86.1	0.15	6.4	F
Indianwood Dr	II	50	34.6	13.5	48.1	0.40	30.1	B
E Bonnyview Rd	II	50	55.9	42.3	98.2	0.78	28.5	B
Eastside Rd	II	40	33.3	18.2	51.5	0.34	23.5	C
State Route 273	II	40	20.8	42.6	63.4	0.18	10.3	F
Total	II		183.2	242.3	425.5	2.00	17.0	E

Appendix C: HCS Outputs

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2616	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	709	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2616	709		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	711	197		v
Trucks and buses	12	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3014	788	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.648 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2231 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3014	7050	No
$v_{FO} = v_F - v_R$	2226	7050	No
v_R	788	2000	No
v_3 or v_{av34}	783 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2231 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2231	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 20.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.499

Space mean speed in ramp influence area, S_R = 53.5 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2616	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	711	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1005	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1005	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.5	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1836	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	780	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1836	780		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	499	222		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2115	900	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1255 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3015	7050	No
v_3 or v_{av34}	860 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		No	

If yes, v_{12A} = 1255 (Equation 13-15, 13-16, 18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3015	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.314	
Space mean speed in ramp influence area,	S_R = 57.8	mph
Space mean speed in outer lanes,	S_0 = 63.7	mph
Space mean speed for all vehicles,	S = 59.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2457	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	621	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2457	621		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	668	176		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2831	716	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.656 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2104 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2831	7050	No
$v_{FO} = v_F - v_R$	2115	7050	No
v_R	716	2000	No
v_3 or v_{av34}	727 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2104 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2104	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 17.4 pc/mi/ln D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.492

Space mean speed in ramp influence area, S_R = 53.7 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.3 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2457	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	668	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	944	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	944	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	14.5	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2457	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	668	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1415	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1415	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	21.8	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2165	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	292	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2165	292		vph
Peak-hour factor, PHF	0.92	0.87		
Peak 15-min volume, v15	588	84		v
Trucks and buses	12	12		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.943	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2494	356	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2494 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2850	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2494 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2850	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 24.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.356	
Space mean speed in ramp influence area,	S_R = 56.8	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.8	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1260	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	238	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1260	238		vph
Peak-hour factor, PHF	0.92	0.79		
Peak 15-min volume, v15	342	75		v
Trucks and buses	12	11		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.948	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1452	318	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1452 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1452	4700	No
$v_{FO} = v_F - v_R$	1134	4700	No
v_R	318	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1452 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1452	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 13.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 54.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.5 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1260	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	342	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	726	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	726	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	11.2	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1260	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	342	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	484	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	484	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	7.4	pc/mi/ln
Level of service, LOS	A	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	841	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	419	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	841	419		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	229	123		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	969	503	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 569 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1472	7050	No
v_3 or v_{av34}	400 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 569 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1472	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.308	
Space mean speed in ramp influence area,	S_R = 57.9	mph
Space mean speed in outer lanes,	S_0 = 65.0	mph
Space mean speed for all vehicles,	S = 59.7	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1442	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	601	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1442	601		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	392	177		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1661	721	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.685 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1365 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1661	7050	No
$v_{FO} = v_F - v_R$	940	7050	No
v_R	721	2000	No
v_3 or v_{av34}	296 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1365 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1365	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 11.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.493	
Space mean speed in ramp influence area,	S_R = 53.7	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 56.1	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1442	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	392	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	554	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	554	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	8.5	pc/mi/ln
Level of service, LOS	A	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1092	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1092	350		vph
Peak-hour factor, PHF	0.94	0.94		
Peak 15-min volume, v15	290	93		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1162	372	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 684 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1534	7050	No
v_3 or v_{av34}	478 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 684 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1534	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 11.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.304	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_0 = 65.0	mph
Space mean speed for all vehicles,	S = 60.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2172	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	502	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2172	502		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	590	132		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2503	534	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.673 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1859 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2503	7050	No
$v_{FO} = v_F - v_R$	1969	7050	No
v_R	534	2000	No
v_3 or v_{av34}	644 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1859 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1859	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.476	
Space mean speed in ramp influence area,	S_R = 54.1	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 57.6	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2172	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	590	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	834	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	834	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	12.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1511	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	661	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1511	661		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	411	174		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1741	706	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1033 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2447	7050	No
v_3 or v_{av34}	708 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1033 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2447	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 15.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.303	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_0 = 64.3	mph
Space mean speed for all vehicles,	S = 59.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1965	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	454	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1965	454		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	534	119		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2264	485	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.681 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1697 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2264	7050	No
$v_{FO} = v_F - v_R$	1779	7050	No
v_R	485	2000	No
v_3 or v_{av34}	567 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1697 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1697	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 13.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.472

Space mean speed in ramp influence area, S_R = 54.2 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.6 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1965	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	534	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	755	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	755	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	11.6	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1965	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	534	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1132	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1132	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1710	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	255	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1710	255		vph
Peak-hour factor, PHF	0.92	0.91		
Peak 15-min volume, v15	465	70		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1970	293	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1970 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2263	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1970 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2263	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.326	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 57.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2696	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	356	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2696	356		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	733	97		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3106	404	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3106 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3106	4700	No
$v_{FO} = v_F - v_R$	2702	4700	No
v_R	404	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3106 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3106	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 27.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.464

Space mean speed in ramp influence area, S_R = 54.3 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.3 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2696	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	733	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1553	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1553	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.7	mi/h
Number of lanes, N	2	
Density, D	24.0	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2696	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	733	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1035	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1035	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2040	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	656	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2040	656		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	554	174		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2350	708	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1380 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3058	7050	No
v_3 or v_{av34}	970 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1380 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3058	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 19.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.328	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_0 = 63.3	mph
Space mean speed for all vehicles,	S = 59.2	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2679	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	639	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2679	639		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	728	170		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3087	690	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.651 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2251 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3087	7050	No
$v_{FO} = v_F - v_R$	2397	7050	No
v_R	690	2000	No
v_3 or v_{av34}	836 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2251 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2251	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 18.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.490

Space mean speed in ramp influence area, S_R = 53.7 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.6 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KI3
Agency or Company:	Omni Means
Date Performed:	11/16/2016
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2679	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	728	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1029	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1029	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	11/16/2016
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1874	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	805	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1874	805		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	509	205		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2057	830	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1211 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2887	7050	No
v_3 or v_{av34}	846 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1211 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2887	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 18.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.323	
Space mean speed in ramp influence area,	S_R = 57.6	mph
Space mean speed in outer lanes,	S_0 = 63.8	mph
Space mean speed for all vehicles,	S = 59.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2540	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	158	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2540	158		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	690	43		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2927	173	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.679 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2043 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2927	7050	No
$v_{FO} = v_F - v_R$	2754	7050	No
v_R	173	2000	No
v_3 or v_{av34}	884 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2043 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2043	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 18.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.444

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 58.9 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2540	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	690	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	976	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	976	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.0	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2022	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	518	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2022	518		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	549	135		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2330	545	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1383 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2875	7050	No
v_3 or v_{av34}	947 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1383 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1928	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 16.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.308	
Space mean speed in ramp influence area,	S_R = 57.9	mph
Space mean speed in outer lanes,	S_0 = 63.4	mph
Space mean speed for all vehicles,	S = 59.6	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2359	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	337	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2359	337		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	641	88		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2718	356	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.676 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1952 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2718	7050	No
$v_{FO} = v_F - v_R$	2362	7050	No
v_R	356	2000	No
v_3 or v_{av34}	766 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1952 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1952	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 16.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.460	
Space mean speed in ramp influence area,	S_R = 54.4	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 58.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2359	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	641	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	906	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	906	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2359	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	641	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1359	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1359	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2097	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	262	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2097	262		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	570	71		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2416	298	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2416 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2714	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2416 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2714	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.347	
Space mean speed in ramp influence area,	S_R = 57.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 57.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2453	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	286	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2453	286		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	667	78		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2826	325	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2826 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2826	4700	No
$v_{FO} = v_F - v_R$	2501	4700	No
v_R	325	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2826 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2826	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 24.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 54.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.5 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2453	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	667	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1413	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1413	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2453	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	667	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	942	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	942	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	14.5	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2127	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	326	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2127	326		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	578	83		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2451	338	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1439 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2789	7050	No
v_3 or v_{av34}	1012 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1439 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1777	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 17.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.320	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_0 = 63.2	mph
Space mean speed for all vehicles,	S = 59.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2567	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	440	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2567	440		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	698	112		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2958	456	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.665 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2120 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2958	7050	No
$v_{FO} = v_F - v_R$	2502	7050	No
v_R	456	2000	No
v_3 or v_{av34}	838 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2120 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2120	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 17.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.469

Space mean speed in ramp influence area, S_R = 54.2 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 58.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	986	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	986	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.2	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2262	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2262	305		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	615	83		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2483	335	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1462 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2818	7050	No
v_3 or v_{av34}	1021 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1462 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1797	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.317	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_0 = 63.1	mph
Space mean speed for all vehicles,	S = 59.6	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2700	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	719	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2700	719		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	734	200		v
Trucks and buses	12	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3111	799	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.645 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2291 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3111	7050	No
$v_{FO} = v_F - v_R$	2312	7050	No
v_R	799	2000	No
v_3 or v_{av34}	820 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2291 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2291	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 20.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.500	
Space mean speed in ramp influence area,	S_R = 53.5	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 57.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2700	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	734	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1037	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1037	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.0	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1834	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	866	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1834	866		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	498	246		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2113	999	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1254 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3112	7050	No
v_3 or v_{av34}	859 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		Yes	

If yes, v_{12A} = 1254 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2253	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.318	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_0 = 63.7	mph
Space mean speed for all vehicles,	S = 59.2	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2526	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	692	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2526	692		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	686	197		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2910	798	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.651 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2172 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2910	7050	No
$v_{FO} = v_F - v_R$	2112	7050	No
v_R	798	2000	No
v_3 or v_{av34}	738 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2172 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2172	4400	No

Level of Service Determination (if not F)

Density, $D_D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 17.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.500	
Space mean speed in ramp influence area,	S_R = 53.5	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 57.1	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	970	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	970	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1455	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1455	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	22.4	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2228	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	298	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2228	298		vph
Peak-hour factor, PHF	0.92	0.87		
Peak 15-min volume, v15	605	86		v
Trucks and buses	12	12		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.943	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2567	363	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2567 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2930	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2567 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2930	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 25.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.361	
Space mean speed in ramp influence area,	S_R = 56.7	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1316	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	243	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1316	243		vph
Peak-hour factor, PHF	0.92	0.79		
Peak 15-min volume, v15	358	77		v
Trucks and buses	12	11		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.948	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1516	325	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1516 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1516	4700	No
$v_{FO} = v_F - v_R$	1191	4700	No
v_R	325	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1516 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1516	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 13.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 54.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.5 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1316	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	358	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	758	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	758	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1316	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	358	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	505	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	505	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	7.8	pc/mi/ln
Level of service, LOS	A	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	840	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	476	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	840	476		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	228	140		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	968	571	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 569 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1539	7050	No
v_3 or v_{av34}	399 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 569 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1140	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 11.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.309	
Space mean speed in ramp influence area,	S_R = 57.9	mph
Space mean speed in outer lanes,	S_0 = 65.0	mph
Space mean speed for all vehicles,	S = 59.6	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1545	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	705	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1545	705		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	420	207		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1780	846	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.677 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1478 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1780	7050	No
$v_{FO} = v_F - v_R$	934	7050	No
v_R	846	2000	No
v_3 or v_{av34}	302 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1478 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1478	4400	No

Level of Service Determination (if not F)

Density, $D_D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 12.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.504

Space mean speed in ramp influence area, S_R = 53.4 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 55.8 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1545	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	420	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	593	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	593	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	9.1	pc/mi/ln
Level of service, LOS	A	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1186	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	359	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1186	359		vph
Peak-hour factor, PHF	0.94	0.94		
Peak 15-min volume, v15	315	95		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1262	382	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 743 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1644	7050	No
v_3 or v_{av34}	519 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 743 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1125	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 11.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.305	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_0 = 64.9	mph
Space mean speed for all vehicles,	S = 60.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2276	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	515	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2276	515		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	618	136		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2622	548	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.669 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1936 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2622	7050	No
$v_{FO} = v_F - v_R$	2074	7050	No
v_R	548	2000	No
v_3 or v_{av34}	686 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1936 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1936	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 17.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.477

Space mean speed in ramp influence area, S_R = 54.0 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.7 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2276	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	618	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	874	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	874	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	13.4	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1440	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	836	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1440	836		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	391	220		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1659	893	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 985 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2552	7050	No
v_3 or v_{av34}	674 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 985 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1878	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 16.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.306	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_0 = 64.4	mph
Space mean speed for all vehicles,	S = 59.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2025	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	585	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2025	585		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	550	154		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2333	625	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.673 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1774 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2333	7050	No
$v_{FO} = v_F - v_R$	1708	7050	No
v_R	625	2000	No
v_3 or v_{av34}	559 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1774 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1774	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 14.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.484

Space mean speed in ramp influence area, S_R = 53.9 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2025	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	550	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	778	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	778	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	12.0	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2025	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	550	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1167	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1167	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	18.0-	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1764	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	261	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1764	261		vph
Peak-hour factor, PHF	0.92	0.91		
Peak 15-min volume, v15	479	72		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2032	300	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 2032 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2332	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2032 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2332	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.329	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 57.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2773	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	362	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2773	362		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	754	98		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3195	411	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3195 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3195	4700	No
$v_{FO} = v_F - v_R$	2784	4700	No
v_R	411	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3195 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3195	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 28.0- pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.465

Space mean speed in ramp influence area, S_R = 54.3 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.3 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2773	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	754	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1597	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1597	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.4	mi/h
Number of lanes, N	2	
Density, D	24.8	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2773	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	754	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1065	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1065	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1952	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	821	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1952	821		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	530	218		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2249	887	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1321 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3136	7050	No
v_3 or v_{av34}	928 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1321 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2208	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.332	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_0 = 63.5	mph
Space mean speed for all vehicles,	S = 59.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2778	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	826	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2778	826		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	755	220		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3201	892	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.639 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2367 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3201	7050	No
$v_{FO} = v_F - v_R$	2309	7050	No
v_R	892	2000	No
v_3 or v_{av34}	834 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2367 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2367	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.508

Space mean speed in ramp influence area, S_R = 53.3 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.1 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2778	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	755	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1067	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1067	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1964	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	814	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1964	814		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	534	208		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2156	839	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1269 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2995	7050	No
v_3 or v_{av34}	887 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1269 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2108	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 19.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.325	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_0 = 63.6	mph
Space mean speed for all vehicles,	S = 59.2	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/23/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2705	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	178	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2705	178		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	735	48		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3117	195	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.673 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2162 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3117	7050	No
$v_{FO} = v_F - v_R$	2922	7050	No
v_R	195	2000	No
v_3 or v_{av34}	955 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2162 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2162	4400	No

Level of Service Determination (if not F)

Density, $D_D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 19.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.446

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 58.9 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/23/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2705	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	735	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1039	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1039	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.0	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1953	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	752	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1953	752		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	531	196		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2250	791	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1336 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3041	7050	No
v_3 or v_{av34}	914 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		Yes	

If yes, v_{12A} = 1336 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2127	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 18.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.313	
Space mean speed in ramp influence area,	S_R = 57.8	mph
Space mean speed in outer lanes,	S_0 = 63.5	mph
Space mean speed for all vehicles,	S = 59.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2466	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	513	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2466	513		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	670	134		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2841	542	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.664 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2069 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2841	7050	No
$v_{FO} = v_F - v_R$	2299	7050	No
v_R	542	2000	No
v_3 or v_{av34}	772 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2069 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2069	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 17.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.477

Space mean speed in ramp influence area, S_R = 54.0 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.8 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2466	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	670	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	947	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	947	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	14.6	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2466	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	670	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1421	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1421	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	21.9	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2194	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	272	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2194	272		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	596	74		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2528	309	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2528 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2837	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2528 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2837	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 24.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.355	
Space mean speed in ramp influence area,	S_R = 56.8	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2567	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	296	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2567		296			vph
Peak-hour factor, PHF	0.92		0.92			
Peak 15-min volume, v15	698		80			v
Trucks and buses	12		9			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2958	336	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2958 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2958	4700	No
$v_{FO} = v_F - v_R$	2622	4700	No
v_R	336	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2958 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2958	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 26.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.458

Space mean speed in ramp influence area, S_R = 54.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.5 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1479	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1479	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	2	
Density, D	22.8	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	986	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	986	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.2	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2054	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	513	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2054	513		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	558	131		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2367	531	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1390 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2898	7050	No
v_3 or v_{av34}	977 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1390 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1921	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 18.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.323	
Space mean speed in ramp influence area,	S_R = 57.6	mph
Space mean speed in outer lanes,	S_0 = 63.3	mph
Space mean speed for all vehicles,	S = 59.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2567	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	678	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2567	678		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	698	173		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2958	702	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.654 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2177 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2958	7050	No
$v_{FO} = v_F - v_R$	2256	7050	No
v_R	702	2000	No
v_3 or v_{av34}	781 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 $v_{12}/2$	No	

If yes, v_{12A} = 2177 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2177	4400	No

Level of Service Determination (if not F)

Density, $D_D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 18.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.491

Space mean speed in ramp influence area, S_R = 53.7 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.4 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2732	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	742	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1049	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1049	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.1	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Proj. Conditions
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2412	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	320	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2412	320		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	655	87		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2648	351	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1559 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2999	7050	No
v_3 or v_{av34}	1089 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1559 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1910	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.319	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_0 = 62.9	mph
Space mean speed for all vehicles,	S = 59.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2858	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	759	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2858	759		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	777	211		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3293	856	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.638 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2412 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3293	7050	No
$v_{FO} = v_F - v_R$	2437	7050	No
v_R	856	2000	No
v_3 or v_{av34}	881 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2412 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2412	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.505

Space mean speed in ramp influence area, S_R = 53.4 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2858	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	777	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1098	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1098	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.9	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1928	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	930	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1928	930		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	524	264		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2221	1073	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1318 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3294	7050	No
v_3 or v_{av34}	903 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1318 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2391	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.0+ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.323	
Space mean speed in ramp influence area,	S_R = 57.6	mph
Space mean speed in outer lanes,	S_0 = 63.5	mph
Space mean speed for all vehicles,	S = 59.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2613	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	685	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2613	685		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	710	195		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3011	790	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.648 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2230 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3011	7050	No
$v_{FO} = v_F - v_R$	2221	7050	No
v_R	790	2000	No
v_3 or v_{av34}	781 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2230 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2230	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 18.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.499

Space mean speed in ramp influence area, S_R = 53.5 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2613	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	710	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1004	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1004	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.4	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2613	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	710	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1505	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1505	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	2	
Density, D	23.2	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2327	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	286	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2327	286		vph
Peak-hour factor, PHF	0.92	0.87		
Peak 15-min volume, v15	632	82		v
Trucks and buses	12	12		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.943	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2681	348	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2681 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3029	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2681 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3029	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 26.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.369	
Space mean speed in ramp influence area,	S_R = 56.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1443	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	235	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1443	235		vph
Peak-hour factor, PHF	0.92	0.79		
Peak 15-min volume, v15	392	74		v
Trucks and buses	12	11		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.948	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1663	314	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1663 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1663	4700	No
$v_{FO} = v_F - v_R$	1349	4700	No
v_R	314	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1663 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1663	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 14.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.456	
Space mean speed in ramp influence area,	S_R = 54.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 54.5	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1443	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	392	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	831	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	831	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	12.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1443	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	392	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	554	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	554	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	8.5	pc/mi/ln
Level of service, LOS	A	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	943	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	943	500		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	256	147		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1086	600	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 638 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1686	7050	No
v_3 or v_{av34}	448 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	Yes	

If yes, v_{12A} = 638 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1238	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.310	
Space mean speed in ramp influence area,	S_R = 57.9	mph
Space mean speed in outer lanes,	S_0 = 65.0	mph
Space mean speed for all vehicles,	S = 59.6	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1658	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	715	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1658	715		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	451	210		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1910	858	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.673 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1566 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1910	7050	No
$v_{FO} = v_F - v_R$	1052	7050	No
v_R	858	2000	No
v_3 or v_{av34}	344 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1566 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1566	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 13.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.505

Space mean speed in ramp influence area, S_R = 53.4 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 55.9 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1658	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	451	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	637	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	637	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	9.8	pc/mi/ln
Level of service, LOS	A	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1293	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	365	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1293	365		vph
Peak-hour factor, PHF	0.94	0.94		
Peak 15-min volume, v15	344	97		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1376	388	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 810 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1764	7050	No
v_3 or v_{av34}	566 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 810 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1198	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.306	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_0 = 64.8	mph
Space mean speed for all vehicles,	S = 60.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2329	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	547	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2329		547			vph
Peak-hour factor, PHF	0.92		0.95			
Peak 15-min volume, v15	633		144			v
Trucks and buses	12		2			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2683	582	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.666 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1982 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2683	7050	No
$v_{FO} = v_F - v_R$	2101	7050	No
v_R	582	2000	No
v_3 or v_{av34}	701 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1982 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1982	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 18.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.480	
Space mean speed in ramp influence area,	S_R = 54.0	mph
Space mean speed in outer lanes,	S_O = 71.3	mph
Space mean speed for all vehicles,	S = 57.6	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2329	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	633	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	894	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	894	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	13.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1569	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	760	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1569	760		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	426	200		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1808	812	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1073 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2620	7050	No
v_3 or v_{av34}	735 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		Yes	

If yes, v_{12A} = 1073 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1885	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.306	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_O = 64.2	mph
Space mean speed for all vehicles,	S = 59.6	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2084	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	515	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2084	515		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	566	136		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2401	550	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.675 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1799 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2401	7050	No
$v_{FO} = v_F - v_R$	1851	7050	No
v_R	550	2000	No
v_3 or v_{av34}	602 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1799 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1799	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, v_{12}$ L_D = 14.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.478	
Space mean speed in ramp influence area,	S_R = 54.0	mph
Space mean speed in outer lanes,	S_O = 71.3	mph
Space mean speed for all vehicles,	S = 57.5	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2084	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	566	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	800	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	800	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	12.3	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2084	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	566	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1201	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1201	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	18.5	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1817	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	267	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1817	267		vph
Peak-hour factor, PHF	0.92	0.91		
Peak 15-min volume, v15	494	73		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2093	307	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2093 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2400	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2093 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2400	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 21.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.331	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 57.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2958	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	360	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2958		360			vph
Peak-hour factor, PHF	0.92		0.92			
Peak 15-min volume, v15	804		98			v
Trucks and buses	12		9			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3408	409	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3408 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3408	4700	No
$v_{FO} = v_F - v_R$	2999	4700	No
v_R	409	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3408 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3408	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 29.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.465	
Space mean speed in ramp influence area,	S_R = 54.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 54.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2958	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	804	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1704	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1704	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.7	mi/h
Number of lanes, N	2	
Density, D	26.8	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2958	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	804	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1136	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1136	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	17.5	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2243	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	715	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2243	715		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	610	190		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2584	772	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1518 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3356	7050	No
v_3 or v_{av34}	1066 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1518 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2290	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.335	
Space mean speed in ramp influence area,	S_R = 57.3	mph
Space mean speed in outer lanes,	S_O = 63.0	mph
Space mean speed for all vehicles,	S = 59.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2973	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	730	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2973	730		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	808	194		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3425	788	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.638 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2471 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3425	7050	No
$v_{FO} = v_F - v_R$	2637	7050	No
v_R	788	2000	No
v_3 or v_{av34}	954 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2471 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2471	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, v_{12}$ L_D = 20.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.499	
Space mean speed in ramp influence area,	S_R = 53.5	mph
Space mean speed in outer lanes,	S_O = 71.3	mph
Space mean speed for all vehicles,	S = 57.5	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2973	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	808	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1142	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1142	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	17.6	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2129	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	844	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2129	844		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	579	215		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2337	870	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1376 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3207	7050	No
v_3 or v_{av34}	961 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	Yes	

If yes, v_{12A} = 1376 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2246	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.330	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_O = 63.3	mph
Space mean speed for all vehicles,	S = 59.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3377	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	173	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3377	173		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	918	47		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3891	190	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.654 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2610 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3891	7050	No
$v_{FO} = v_F - v_R$	3701	7050	No
v_R	190	2000	No
v_3 or v_{av34}	1281 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2610 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2610	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.445

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_0 = 70.2 mph

Space mean speed for all vehicles, S = 59.0 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3377	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	918	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1297	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1297	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	20.0	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2772	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	605	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2772	605		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	753	158		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3194	637	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1896 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3831	7050	No
v_3 or v_{av34}	1298 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1896 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2533	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 21.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.330	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_0 = 62.1	mph
Space mean speed for all vehicles,	S = 58.9	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3142	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	370	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3142	370		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	854	96		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3620	391	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.652 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2495 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3620	7050	No
$v_{FO} = v_F - v_R$	3229	7050	No
v_R	391	2000	No
v_3 or v_{av34}	1125 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2495 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2495	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 20.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.463	
Space mean speed in ramp influence area,	S_R = 54.3	mph
Space mean speed in outer lanes,	S_0 = 70.8	mph
Space mean speed for all vehicles,	S = 58.6	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3142	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	854	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1207	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1207	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	18.6	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3142	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	854	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1810	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1810	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	2	
Density, D	28.9	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2867	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	275	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2867	275		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	779	75		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3303	312	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3303 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3615	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3303 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3615	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.433	
Space mean speed in ramp influence area,	S_R = 55.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 55.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2734	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	290	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2734		290			vph
Peak-hour factor, PHF	0.92		0.92			
Peak 15-min volume, v15	743		79			v
Trucks and buses	12		9			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3150	329	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3150 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3150	4700	No
$v_{FO} = v_F - v_R$	2821	4700	No
v_R	329	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3150 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3150	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 27.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.458	
Space mean speed in ramp influence area,	S_R = 54.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 54.5	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2734	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	743	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1575	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1575	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.6	mi/h
Number of lanes, N	2	
Density, D	24.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2734	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	743	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1050	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1050	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.2	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2359	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	375	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2359	375		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	641	96		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2718	388	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1596 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3106	7050	No
v_3 or v_{av34}	1122 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1596 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1984	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 18.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.325	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_0 = 62.8	mph
Space mean speed for all vehicles,	S = 59.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2849	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	490	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2849		490			vph
Peak-hour factor, PHF	0.92		0.98			
Peak 15-min volume, v15	774		125			v
Trucks and buses	12		3			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3283	507	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.655 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2324 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3283	7050	No
$v_{FO} = v_F - v_R$	2776	7050	No
v_R	507	2000	No
v_3 or v_{av34}	959 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2324 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2324	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, v_{12}$ L_D = 19.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.474	
Space mean speed in ramp influence area,	S_R = 54.1	mph
Space mean speed in outer lanes,	S_O = 71.3	mph
Space mean speed for all vehicles,	S = 58.2	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2849	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	774	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1094	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1094	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2529	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	320	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2529	320		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	687	87		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2776	351	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1634 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3127	7050	No
v_3 or v_{av34}	1142 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	Yes	

If yes, v_{12A} = 1634 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1985	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 18.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.321	
Space mean speed in ramp influence area,	S_R = 57.6	mph
Space mean speed in outer lanes,	S_0 = 62.7	mph
Space mean speed for all vehicles,	S = 59.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2942	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	769	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2942	769		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	799	214		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3390	867	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.635 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2470 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3390	7050	No
$v_{FO} = v_F - v_R$	2523	7050	No
v_R	867	2000	No
v_3 or v_{av34}	920 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2470 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2470	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.506	
Space mean speed in ramp influence area,	S_R = 53.4	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 57.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2942	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	799	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1130	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1130	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1926	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1016	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1926	1016		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	523	289		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2219	1172	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1317 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3391	7050	No
v_3 or v_{av34}	902 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1317 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2489	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 20.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.328	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_0 = 63.6	mph
Space mean speed for all vehicles,	S = 59.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2682	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	756	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2682	756		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	729	215		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3090	872	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.643 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2297 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3090	7050	No
$v_{FO} = v_F - v_R$	2218	7050	No
v_R	872	2000	No
v_3 or v_{av34}	793 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2297 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2297	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 19.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.506	
Space mean speed in ramp influence area,	S_R = 53.4	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 57.0	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2682	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	729	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1030	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1030	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2682	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	729	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1545	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1545	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.7	mi/h
Number of lanes, N	2	
Density, D	23.9	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2390	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	292	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2390	292		vph
Peak-hour factor, PHF	0.92	0.87		
Peak 15-min volume, v15	649	84		v
Trucks and buses	12	12		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.943	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2754	356	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2754 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3110	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2754 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3110	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 26.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.376	
Space mean speed in ramp influence area,	S_R = 56.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1499	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	240	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1499	240		vph
Peak-hour factor, PHF	0.92	0.79		
Peak 15-min volume, v15	407	76		v
Trucks and buses	12	11		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.948	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1727	321	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1727 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1727	4700	No
$v_{FO} = v_F - v_R$	1406	4700	No
v_R	321	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1727 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1727	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 15.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 54.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.5 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1499	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	407	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	864	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	864	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	13.3	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1499	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	407	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	576	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	576	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	8.9	pc/mi/ln
Level of service, LOS	A	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	557	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	942	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	557	942		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	151	277		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	642	1130	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 377 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1772	7050	No
v_3 or v_{av34}	265 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 377 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1507	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 14.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.314	
Space mean speed in ramp influence area,	S_R = 57.8	mph
Space mean speed in outer lanes,	S_0 = 65.0	mph
Space mean speed for all vehicles,	S = 58.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1761	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	819	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1761	819		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	479	241		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2029	983	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.664 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1678 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2029	7050	No
$v_{FO} = v_F - v_R$	1046	7050	No
v_R	983	2000	No
v_3 or v_{av34}	351 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1678 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1678	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 14.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.516

Space mean speed in ramp influence area, S_R = 53.1 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 55.6 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	1761	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	479	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	676	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	676	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	10.4	pc/mi/ln
Level of service, LOS	A	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2387	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	374	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2387	374		vph
Peak-hour factor, PHF	0.94	0.94		
Peak 15-min volume, v15	635	99		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2539	398	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1495 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2937	7050	No
v_3 or v_{av34}	1044 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1495 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1893	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.319	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_0 = 63.0	mph
Space mean speed for all vehicles,	S = 59.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2433	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	560	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2433		560			vph
Peak-hour factor, PHF	0.92		0.95			
Peak 15-min volume, v15	661		147			v
Trucks and buses	12		2			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2803	595	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.663 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2058 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2803	7050	No
$v_{FO} = v_F - v_R$	2208	7050	No
v_R	595	2000	No
v_3 or v_{av34}	745 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		No	

If yes, v_{12A} = 2058 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2058	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 18.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.482	
Space mean speed in ramp influence area,	S_R = 53.9	mph
Space mean speed in outer lanes,	S_O = 71.3	mph
Space mean speed for all vehicles,	S = 57.7	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2433	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	661	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	934	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	934	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	14.4	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1498	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	935	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1498	935		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	407	246		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1726	999	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1025 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2725	7050	No
v_3 or v_{av34}	701 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		Yes	

If yes, v_{12A} = 1025 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2024	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.310	
Space mean speed in ramp influence area,	S_R = 57.9	mph
Space mean speed in outer lanes,	S_O = 64.3	mph
Space mean speed for all vehicles,	S = 59.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2144	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	646	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2144	646		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	583	170		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2470	690	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.667 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1876 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2470	7050	No
$v_{FO} = v_F - v_R$	1780	7050	No
v_R	690	2000	No
v_3 or v_{av34}	594 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1876 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1876	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 15.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.490

Space mean speed in ramp influence area, S_R = 53.7 mph

Space mean speed in outer lanes, S_O = 71.3 mph

Space mean speed for all vehicles, S = 57.1 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2144	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	583	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	823	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	823	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2144	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	583	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1235	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1235	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	19.0	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1871	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	273	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1871	273		vph
Peak-hour factor, PHF	0.92	0.91		
Peak 15-min volume, v15	508	75		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2156	313	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 2156 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2469	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2156 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2469	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_{R} + 0.0078\, v_{12} - 0.00627\, L_A =$ 21.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.335	
Space mean speed in ramp influence area,	S_R = 57.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 57.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3035	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	366	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3035		366			vph
Peak-hour factor, PHF	0.92		0.92			
Peak 15-min volume, v15	825		99			v
Trucks and buses	12		9			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3497	416	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3497 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3497	4700	No
$v_{FO} = v_F - v_R$	3081	4700	No
v_R	416	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3497 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3497	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 30.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.465	
Space mean speed in ramp influence area,	S_R = 54.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 54.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3035	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	825	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1748	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1748	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.3	mi/h
Number of lanes, N	2	
Density, D	27.6	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3035	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	825	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1166	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1166	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	17.9	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2155	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	880	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2155	880		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	586	234		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2483	950	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1458 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3433	7050	No
v_3 or v_{av34}	1025 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1458 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2408	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 21.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.340	
Space mean speed in ramp influence area,	S_R = 57.2	mph
Space mean speed in outer lanes,	S_O = 63.1	mph
Space mean speed for all vehicles,	S = 58.8	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3072	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	917	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3072	917		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	835	244		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3539	990	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.626 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2586 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3539	7050	No
$v_{FO} = v_F - v_R$	2549	7050	No
v_R	990	2000	No
v_3 or v_{av34}	953 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2586 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2586	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, v_{12}\, L_D$ = 21.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.517	
Space mean speed in ramp influence area,	S_R = 53.1	mph
Space mean speed in outer lanes,	S_O = 71.3	mph
Space mean speed for all vehicles,	S = 57.0	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3072	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	835	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1180	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1180	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	18.2	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2219	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	853	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2219	853		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	603	218		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2436	879	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1434 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3315	7050	No
v_3 or v_{av34}	1002 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1434 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2313	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.332	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_O = 63.2	mph
Space mean speed for all vehicles,	S = 59.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3542	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	193	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3542	193		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	962	52		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4081	212	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.648 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2720 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4081	7050	No
$v_{FO} = v_F - v_R$	3869	7050	No
v_R	212	2000	No
v_3 or v_{av34}	1361 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2720 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2720	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 24.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.447

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_0 = 69.9 mph

Space mean speed for all vehicles, S = 59.0 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3542	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	962	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1360	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1360	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2703	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	839	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2703	839		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	735	218		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3114	883	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1848 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3997	7050	No
v_3 or v_{av34}	1266 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1848 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2731	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 22.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.341	
Space mean speed in ramp influence area,	S_R = 57.2	mph
Space mean speed in outer lanes,	S_0 = 62.2	mph
Space mean speed for all vehicles,	S = 58.7	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3249	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	546	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3249	546		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	883	142		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3743	577	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.640 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2603 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3743	7050	No
$v_{FO} = v_F - v_R$	3166	7050	No
v_R	577	2000	No
v_3 or v_{av34}	1140 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2603 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2603	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 21.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.480

Space mean speed in ramp influence area, S_R = 54.0 mph

Space mean speed in outer lanes, S_0 = 70.8 mph

Space mean speed for all vehicles, S = 58.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3249	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	883	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1248	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1248	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.2	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3249	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	883	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1872	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1872	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.8	mi/h
Number of lanes, N	2	
Density, D	30.3	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2964	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	285	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2964	285		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	805	77		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3415	324	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3415 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3739	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3415 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3739	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 31.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.452	
Space mean speed in ramp influence area,	S_R = 54.6	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 54.6	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2848	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	300	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2848	300		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	774	82		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3281	341	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3281 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3281	4700	No
$v_{FO} = v_F - v_R$	2940	4700	No
v_R	341	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3281 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3281	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 28.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.459	
Space mean speed in ramp influence area,	S_R = 54.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 54.5	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2848	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	774	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1641	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1641	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.2	mi/h
Number of lanes, N	2	
Density, D	25.6	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2848	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	774	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1094	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1094	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	16.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2286	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	562	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2286	562		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	621	143		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2634	582	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1547 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3216	7050	No
v_3 or v_{av34}	1087 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1547 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2129	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.329	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_O = 62.9	mph
Space mean speed for all vehicles,	S = 59.2	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3014	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	728	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3014	728		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	819	186		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3473	754	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.638 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2490 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3473	7050	No
$v_{FO} = v_F - v_R$	2719	7050	No
v_R	754	2000	No
v_3 or v_{av34}	983 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2490 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2490	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, v_{12}$ L_D = 20.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.496	
Space mean speed in ramp influence area,	S_R = 53.6	mph
Space mean speed in outer lanes,	S_O = 71.3	mph
Space mean speed for all vehicles,	S = 57.6	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3014	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	819	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1158	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1158	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	17.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2020 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2679	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	335	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2679	335		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	728	91		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2941	368	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1731 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3309	7050	No
v_3 or v_{av34}	1210 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1731 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2099	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.325	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_0 = 62.4	mph
Space mean speed for all vehicles,	S = 59.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3825	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	960	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3825	960		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	1039	267		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4407	1083	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.600 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3077 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4407	7050	No
$v_{FO} = v_F - v_R$	3324	7050	No
v_R	1083	2000	No
v_3 or v_{av34}	1330 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3077 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3077	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 27.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.525

Space mean speed in ramp influence area, S_R = 52.9 mph

Space mean speed in outer lanes, S_0 = 70.0 mph

Space mean speed for all vehicles, S = 57.1 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3825	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1039	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1469	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1469	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.6	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2830	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	995	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2830	995		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	769	283		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3261	1148	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1936 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4409	7050	No
v_3 or v_{av34}	1325 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1936 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3084	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.366	
Space mean speed in ramp influence area,	S_R = 56.6	mph
Space mean speed in outer lanes,	S_0 = 62.0	mph
Space mean speed for all vehicles,	S = 58.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3680	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	850	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3680	850		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	1000	241		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4240	980	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.609 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2965 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4240	7050	No
$v_{FO} = v_F - v_R$	3260	7050	No
v_R	980	2000	No
v_3 or v_{av34}	1275 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2965 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2965	4400	No

Level of Service Determination (if not F)

Density, $D_D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 24.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.516	
Space mean speed in ramp influence area,	S_R = 53.1	mph
Space mean speed in outer lanes,	S_0 = 70.2	mph
Space mean speed for all vehicles,	S = 57.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3680	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1000	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1413	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1413	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3680	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1000	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2120	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2120	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.6	mi/h
Number of lanes, N	2	
Density, D	36.8	pc/mi/ln
Level of service, LOS	E	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3419	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	261	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3419	261		vph
Peak-hour factor, PHF	0.92	0.87		
Peak 15-min volume, v15	929	75		v
Trucks and buses	12	12		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.943	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3939	318	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3939 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4257	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3939 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4257	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 35.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S = 0.564	
Space mean speed in ramp influence area,	S_R = 52.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 52.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2188	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	224	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2188	224		vph
Peak-hour factor, PHF	0.92	0.79		
Peak 15-min volume, v15	595	71		v
Trucks and buses	12	11		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.948	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2521	299	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2521 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2521	4700	No
$v_{FO} = v_F - v_R$	2222	4700	No
v_R	299	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2521 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2521	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 22.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.455

Space mean speed in ramp influence area, S_R = 54.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 54.5 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2188	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	595	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1260	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1260	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	19.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2188	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	595	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	840	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	840	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	12.9	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1613	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	575	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1613	575		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	438	169		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1858	690	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1091 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2548	7050	No
v_3 or v_{av34}	767 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1091 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1781	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.320	
Space mean speed in ramp influence area,	S_R = 57.6	mph
Space mean speed in outer lanes,	S_0 = 64.0	mph
Space mean speed for all vehicles,	S = 59.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2523	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	910	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2523	910		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	686	268		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2907	1092	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.637 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2248 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2907	7050	No
$v_{FO} = v_F - v_R$	1815	7050	No
v_R	1092	2000	No
v_3 or v_{av34}	659 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2248 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2248	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 18.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.526	
Space mean speed in ramp influence area,	S_R = 52.9	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 56.2	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2523	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	969	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	969	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2098	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	425	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2098	425		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	570	115		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2280	462	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1342 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2742	7050	No
v_3 or v_{av34}	938 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		Yes	

If yes, v_{12A} = 1342 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1804	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.317	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_0 = 63.4	mph
Space mean speed for all vehicles,	S = 59.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2957	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	725	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2957	725		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	804	191		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3407	771	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.639 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2456 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3407	7050	No
$v_{FO} = v_F - v_R$	2636	7050	No
v_R	771	2000	No
v_3 or v_{av34}	951 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2456 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2456	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 22.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.497	
Space mean speed in ramp influence area,	S_R = 53.6	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 57.6	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2957	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	804	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1136	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1136	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	17.5	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1992	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	965	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1992	965		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	541	254		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2295	1031	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1362 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3326	7050	No
v_3 or v_{av34}	933 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1362 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2393	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.323	
Space mean speed in ramp influence area,	S_R = 57.6	mph
Space mean speed in outer lanes,	S_0 = 63.4	mph
Space mean speed for all vehicles,	S = 59.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2617	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	625	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2617	625		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	711	164		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3015	668	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.654 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2203 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3015	7050	No
$v_{FO} = v_F - v_R$	2347	7050	No
v_R	668	2000	No
v_3 or v_{av34}	812 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2203 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2203	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 18.2 pc/mi/ln D

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.488

Space mean speed in ramp influence area, S_R = 53.8 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.6 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2617	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	711	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1005	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1005	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.5	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2617	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	711	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1508	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1508	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	2	
Density, D	23.3	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2302	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	315	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2302	315		vph
Peak-hour factor, PHF	0.92	0.91		
Peak 15-min volume, v15	626	87		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2652	362	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2652 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3014	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2652 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3014	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 25.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.368	
Space mean speed in ramp influence area,	S_R = 56.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3802	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	375	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3802	375		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	1033	102		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4381	426	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4381 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4381	4700	No
$v_{FO} = v_F - v_R$	3955	4700	No
v_R	426	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 4381 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4381	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 38.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	D_S = 0.466	
Space mean speed in ramp influence area,	S_R = 54.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 54.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3802	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1033	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2190	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2190	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	56.2	mi/h
Number of lanes, N	2	
Density, D	39.0	pc/mi/ln
Level of service, LOS	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3802	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1033	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1460	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1460	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.5	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2917	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	885	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2917	885		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	793	235		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3361	956	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1974 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4317	7050	No
v_3 or v_{av34}	1387 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1974 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2930	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 25.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.370	
Space mean speed in ramp influence area,	S_R = 56.5	mph
Space mean speed in outer lanes,	S_0 = 61.8	mph
Space mean speed for all vehicles,	S = 58.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	3/1/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3722	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	805	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3722	805		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	1011	214		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4288	869	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.613 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2964 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4288	7050	No
$v_{FO} = v_F - v_R$	3419	7050	No
v_R	869	2000	No
v_3 or v_{av34}	1324 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2964 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2964	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 25.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.506

Space mean speed in ramp influence area, S_R = 53.4 mph

Space mean speed in outer lanes, S_0 = 70.0 mph

Space mean speed for all vehicles, S = 57.6 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3722	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1011	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1429	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1429	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.0	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2722	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1000	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2722	1000		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	740	255		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2988	1031	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1759 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4019	7050	No
v_3 or v_{av34}	1229 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1759 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2790	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 24.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.356	
Space mean speed in ramp influence area,	S_R = 56.8	mph
Space mean speed in outer lanes,	S_0 = 62.4	mph
Space mean speed for all vehicles,	S = 58.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3457	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	229	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3457	229		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	939	62		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3983	251	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.649 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2673 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3983	7050	No
$v_{FO} = v_F - v_R$	3732	7050	No
v_R	251	2000	No
v_3 or v_{av34}	1310 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2673 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2673	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 24.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.451

Space mean speed in ramp influence area, S_R = 54.6 mph

Space mean speed in outer lanes, S_0 = 70.1 mph

Space mean speed for all vehicles, S = 58.9 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3457	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	939	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1328	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1328	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	20.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2707	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	750	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2707	750		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	736	195		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3119	789	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1851 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3908	7050	No
v_3 or v_{av34}	1268 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1851 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2640	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.335	
Space mean speed in ramp influence area,	S_R = 57.3	mph
Space mean speed in outer lanes,	S_0 = 62.2	mph
Space mean speed for all vehicles,	S = 58.8	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3167	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	460	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3167	460		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	861	120		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3649	486	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.646 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2531 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3649	7050	No
$v_{FO} = v_F - v_R$	3163	7050	No
v_R	486	2000	No
v_3 or v_{av34}	1118 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2531 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2531	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 21.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.472	
Space mean speed in ramp influence area,	S_R = 54.1	mph
Space mean speed in outer lanes,	S_0 = 70.8	mph
Space mean speed for all vehicles,	S = 58.4	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3167	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	861	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1216	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1216	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	18.7	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3167	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	861	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1824	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1824	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	2	
Density, D	29.2	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2843	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	324	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2843	324		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	773	88		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3276	368	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3276 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3644	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3276 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3644	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 30.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.438	
Space mean speed in ramp influence area,	S_R = 54.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 54.9	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3466	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	302	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3466		302			vph
Peak-hour factor, PHF	0.92		0.92			
Peak 15-min volume, v15	942		82			v
Trucks and buses	12		9			%
Recreational vehicles	0		0			%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	1.5		1.5			
Recreational vehicle PCE, ER	1.2		1.2			

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3993	343	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3993 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3993	4700	No
$v_{FO} = v_F - v_R$	3650	4700	No
v_R	343	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3993 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3993	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 34.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.459	
Space mean speed in ramp influence area,	S_R = 54.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 54.4	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3466	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	942	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1997	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1997	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	59.9	mi/h
Number of lanes, N	2	
Density, D	33.3	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3466	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	942	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1331	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1331	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	20.5	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3016	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	450	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3016	450		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	820	115		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3475	466	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2041 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3941	7050	No
v_3 or v_{av34}	1434 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 2041 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2507	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.344	
Space mean speed in ramp influence area,	S_R = 57.1	mph
Space mean speed in outer lanes,	S_0 = 61.6	mph
Space mean speed for all vehicles,	S = 58.7	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3566	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	550	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3566	550		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	969	140		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4109	570	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.631 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2803 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4109	7050	No
$v_{FO} = v_F - v_R$	3539	7050	No
v_R	570	2000	No
v_3 or v_{av34}	1306 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2803 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2803	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 23.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.479	
Space mean speed in ramp influence area,	S_R = 54.0	mph
Space mean speed in outer lanes,	S_0 = 70.1	mph
Space mean speed for all vehicles,	S = 58.2	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3566	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	969	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1370	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1370	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 No Project Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3187	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	379	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3187	379		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	866	103		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3499	416	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2060 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3915	7050	No
v_3 or v_{av34}	1439 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 2060 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2476	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.339	
Space mean speed in ramp influence area,	S_R = 57.2	mph
Space mean speed in outer lanes,	S_0 = 61.6	mph
Space mean speed for all vehicles,	S = 58.7	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3909	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	970	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3909	970		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	1062	269		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4504	1094	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.597 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3130 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4504	7050	No
$v_{FO} = v_F - v_R$	3410	7050	No
v_R	1094	2000	No
v_3 or v_{av34}	1374 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3130 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3130	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 28.0- pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.526	
Space mean speed in ramp influence area,	S_R = 52.9	mph
Space mean speed in outer lanes,	S_0 = 69.8	mph
Space mean speed for all vehicles,	S = 57.1	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3909	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1062	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1501	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1501	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2828	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1081	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2828	1081		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	768	307		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3258	1247	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1934 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4505	7050	No
v_3 or v_{av34}	1324 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1934 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3181	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 26.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.375	
Space mean speed in ramp influence area,	S_R = 56.4	mph
Space mean speed in outer lanes,	S_0 = 62.0	mph
Space mean speed for all vehicles,	S = 57.9	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3749	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	921	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3749	921		vph
Peak-hour factor, PHF	0.92	0.88		
Peak 15-min volume, v15	1019	262		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4319	1062	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.603 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3027 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4319	7050	No
$v_{FO} = v_F - v_R$	3257	7050	No
v_R	1062	2000	No
v_3 or v_{av34}	1292 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3027 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3027	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 25.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.524

Space mean speed in ramp influence area, S_R = 53.0 mph

Space mean speed in outer lanes, S_0 = 70.2 mph

Space mean speed for all vehicles, S = 57.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3749	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1019	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1440	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1440	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.2	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3749	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1019	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2160	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2160	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	56.8	mi/h
Number of lanes, N	2	
Density, D	38.0	pc/mi/ln
Level of service, LOS	E	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3482	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	267	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3482	267		vph
Peak-hour factor, PHF	0.92	0.87		
Peak 15-min volume, v15	946	77		v
Trucks and buses	12	12		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.943	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4012	325	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4012 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4337	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4012 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4337	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 36.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S = 0.587	
Space mean speed in ramp influence area,	S_R = 51.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 51.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2244	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	229	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2244	229		vph
Peak-hour factor, PHF	0.92	0.79		
Peak 15-min volume, v15	610	72		v
Trucks and buses	12	11		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.948	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2585	306	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2585 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2585	4700	No
$v_{FO} = v_F - v_R$	2279	4700	No
v_R	306	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2585 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2585	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 22.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.456	
Space mean speed in ramp influence area,	S_R = 54.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 54.5	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2244	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	610	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1293	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1293	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	19.9	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2244	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	610	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	862	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	862	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	13.3	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1612	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	632	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1612	632		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	438	186		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1857	758	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1091 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2615	7050	No
v_3 or v_{av34}	766 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1091 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1849	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.321	
Space mean speed in ramp influence area,	S_R = 57.6	mph
Space mean speed in outer lanes,	S_0 = 64.0	mph
Space mean speed for all vehicles,	S = 59.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2626	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1014	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2626	1014		vph
Peak-hour factor, PHF	0.92	0.85		
Peak 15-min volume, v15	714	298		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3026	1217	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.628 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2354 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3026	7050	No
$v_{FO} = v_F - v_R$	1809	7050	No
v_R	1217	2000	No
v_3 or v_{av34}	672 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2354 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2354	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 19.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.538	
Space mean speed in ramp influence area,	S_R = 52.6	mph
Space mean speed in outer lanes,	S_0 = 71.3	mph
Space mean speed for all vehicles,	S = 55.9	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	AM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2626	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	714	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1009	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1009	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.5	pc/mi/ln
Level of service, LOS	B	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	AM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2192	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	434	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2192	434		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	596	118		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2383	472	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1403 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2855	7050	No
v_3 or v_{av34}	980 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1403 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1875	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 17.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.318	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_0 = 63.3	mph
Space mean speed for all vehicles,	S = 59.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3061	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	738	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3061	738		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	832	194		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3527	785	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.636 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2528 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3527	7050	No
$v_{FO} = v_F - v_R$	2742	7050	No
v_R	785	2000	No
v_3 or v_{av34}	999 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2528 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2528	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 22.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.499

Space mean speed in ramp influence area, S_R = 53.5 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.6 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3061	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	832	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1176	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1176	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	18.1	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1921	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1921	1140		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	522	300		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2213	1218	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1314 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3431	7050	No
v_3 or v_{av34}	899 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1314 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2532	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.330	
Space mean speed in ramp influence area,	S_R = 57.4	mph
Space mean speed in outer lanes,	S_0 = 63.6	mph
Space mean speed for all vehicles,	S = 58.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2677	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	756	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2677	756		vph
Peak-hour factor, PHF	0.92	0.95		
Peak 15-min volume, v15	727	199		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3084	808	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.646 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2278 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3084	7050	No
$v_{FO} = v_F - v_R$	2276	7050	No
v_R	808	2000	No
v_3 or v_{av34}	806 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2278 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2278	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 18.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.501

Space mean speed in ramp influence area, S_R = 53.5 mph

Space mean speed in outer lanes, S_0 = 71.3 mph

Space mean speed for all vehicles, S = 57.2 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2677	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	727	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1028	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1028	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	2677	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	727	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1542	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1542	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.7	mi/h
Number of lanes, N	2	
Density, D	23.8	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2356	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	321	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2356	321		vph
Peak-hour factor, PHF	0.92	0.91		
Peak 15-min volume, v15	640	88		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2715	369	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2715 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3084	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2715 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3084	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 26.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.374	
Space mean speed in ramp influence area,	S_R = 56.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3879	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	381	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3879	381		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	1054	104		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4469	433	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4469 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4469	4700	No
$v_{FO} = v_F - v_R$	4036	4700	No
v_R	433	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 4469 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4469	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 39.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	D_S = 0.467	
Space mean speed in ramp influence area,	S_R = 54.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 54.3	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3879	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1054	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2235	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2235	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	55.1	mi/h
Number of lanes, N	2	
Density, D	40.6	pc/mi/ln
Level of service, LOS	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3879	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1054	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1490	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1490	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	23.0	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2829	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1050	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2829	1050		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	769	279		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3259	1134	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1914 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4393	7050	No
v_3 or v_{av34}	1345 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1914 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3048	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 26.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.379	
Space mean speed in ramp influence area,	S_R = 56.3	mph
Space mean speed in outer lanes,	S_0 = 62.0	mph
Space mean speed for all vehicles,	S = 57.9	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KI3
Agency/Co.:	Omni Means
Date performed:	3/1/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3821	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	992	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3821	992		vph
Peak-hour factor, PHF	0.92	0.94		
Peak 15-min volume, v15	1038	264		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4402	1071	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.601 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3072 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4402	7050	No
$v_{FO} = v_F - v_R$	3331	7050	No
v_R	1071	2000	No
v_3 or v_{av34}	1330 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 3072 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3072	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 25.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.524	
Space mean speed in ramp influence area,	S_R = 52.9	mph
Space mean speed in outer lanes,	S_0 = 70.0	mph
Space mean speed for all vehicles,	S = 57.2	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/14/2017
Analysis Time Period:	PM Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3821	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1038	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1467	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1467	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.6	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/14/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2812	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1009	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2812	1009		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	764	257		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3087	1040	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1817 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4127	7050	No
v_3 or v_{av34}	1270 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1817 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2857	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 24.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.361	
Space mean speed in ramp influence area,	S_R = 56.7	mph
Space mean speed in outer lanes,	S_0 = 62.2	mph
Space mean speed for all vehicles,	S = 58.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Cypress Ave Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3622	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	249	vph
Length of first accel/decel lane	355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3622	249		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	984	68		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	%	
Length	0.00 mi	0.00 mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4173	273	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.643 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2781 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4173	7050	No
$v_{FO} = v_F - v_R$	3900	7050	No
v_R	273	2000	No
v_3 or v_{av34}	1392 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2781 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2781	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 25.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.453

Space mean speed in ramp influence area, S_R = 54.6 mph

Space mean speed in outer lanes, S_0 = 69.8 mph

Space mean speed for all vehicles, S = 58.9 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Bonnyview Rd to Cypress Ave
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3622	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	984	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1391	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1391	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.4	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2638	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	984	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2638	984		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	717	256		v
Trucks and buses	12	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3039	1035	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.594 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1804 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4074	7050	No
v_3 or v_{av34}	1235 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1804 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2839	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.347	
Space mean speed in ramp influence area,	S_R = 57.0	mph
Space mean speed in outer lanes,	S_0 = 62.4	mph
Space mean speed for all vehicles,	S = 58.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3274	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	636	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3274	636		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	890	166		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3772	672	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.635 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2640 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3772	7050	No
$v_{FO} = v_F - v_R$	3100	7050	No
v_R	672	2000	No
v_3 or v_{av34}	1132 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2640 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2640	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 22.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.488

Space mean speed in ramp influence area, S_R = 53.8 mph

Space mean speed in outer lanes, S_0 = 70.8 mph

Space mean speed for all vehicles, S = 57.9 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3274	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	890	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1257	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1257	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.3	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 NB
From/To:	Knighton Rd to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3274	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	890	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1886	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1886	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.7	mi/h
Number of lanes, N	2	
Density, D	30.6	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 NB
Junction:	Knighton Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2940	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	334	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2940	334		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	799	91		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3387	379	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3387 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3766	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3387 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3766	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 31.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.457	
Space mean speed in ramp influence area,	S_R = 54.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 54.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3580	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	312	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3580	312		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	973	85		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4125	354	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4125 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4125	4700	No
$v_{FO} = v_F - v_R$	3771	4700	No
v_R	354	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 4125 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4125	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 36.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	D_S = 0.460	
Space mean speed in ramp influence area,	S_R = 54.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 54.4	mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3580	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	973	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2062	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2062	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	58.8	mi/h
Number of lanes, N	2	
Density, D	35.1	pc/mi/ln
Level of service, LOS	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3580	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	973	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1375	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1375	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2943	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	637	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2943	637		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	800	162		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3391	660	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.587 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1992 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4051	7050	No
v_3 or v_{av34}	1399 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 1992 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2652	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.352	
Space mean speed in ramp influence area,	S_R = 56.9	mph
Space mean speed in outer lanes,	S_0 = 61.8	mph
Space mean speed for all vehicles,	S = 58.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Bonnyview Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3731	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	788	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3731	788		vph
Peak-hour factor, PHF	0.92	0.98		
Peak 15-min volume, v15	1014	201		v
Trucks and buses	12	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4299	816	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.615 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2958 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4299	7050	No
$v_{FO} = v_F - v_R$	3483	7050	No
v_R	816	2000	No
v_3 or v_{av34}	1341 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2958 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2958	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 25.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.501

Space mean speed in ramp influence area, S_R = 53.5 mph

Space mean speed in outer lanes, S_0 = 70.0 mph

Space mean speed for all vehicles, S = 57.7 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AC
Agency or Company:	Omni Means
Date Performed:	3/15/2017
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Cypress Ave to Bonnyview Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Flow Inputs and Adjustments

Volume, V	3731	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1014	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1433	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1433	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.1	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Freeway Merge and Diverge Segments Release 6.80

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AC
Agency/Co.:	Omni Means
Date performed:	3/15/2017
Analysis time period:	PM Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Cypress Ave On Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3337	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	394	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3337	394		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	907	107		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.990	0.990	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3663	433	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.589 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2156 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4096	7050	No
v_3 or v_{av34}	1507 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 Yes

If yes, v_{12A} = 2156 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2589	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.345	
Space mean speed in ramp influence area,	S_R = 57.1	mph
Space mean speed in outer lanes,	S_0 = 61.4	mph
Space mean speed for all vehicles,	S = 58.6	mph

Mitigated HCS

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	ZRS
Agency/Co.:	GHD
Date performed:	11/4/19
Analysis time period:	Saturday Peak Hour
Freeway/Dir of Travel:	I-5 SB
Junction:	Knighton Rd Off Ramp
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR Mitigation

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3580	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	312	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3580	312		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	973	85		v
Trucks and buses	12	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.957	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4125	354	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.641 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2770 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4125	7050	No
$v_{FO} = v_F - v_R$	3771	7050	No
v_R	354	2000	No
v_3 or v_{av34}	1355 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12} /2		No	

If yes, v_{12A} = 2770 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2770	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 24.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.460

Space mean speed in ramp influence area, S_R = 54.4 mph

Space mean speed in outer lanes, S_O = 69.9 mph

Space mean speed for all vehicles, S = 58.7 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	ZRS
Agency or Company:	GHD
Date Performed:	11/4/19
Analysis Time Period:	Saturday Peak Hour
Freeway/Direction:	I-5 SB
From/To:	Bonnyview Rd to Knighton Rd
Jurisdiction:	Caltrans
Analysis Year:	Year 2040 Plus Prj. Condition
Description:	Costco Wholesale TIAR Mitigation

Flow Inputs and Adjustments

Volume, V	3580	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	973	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1375	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

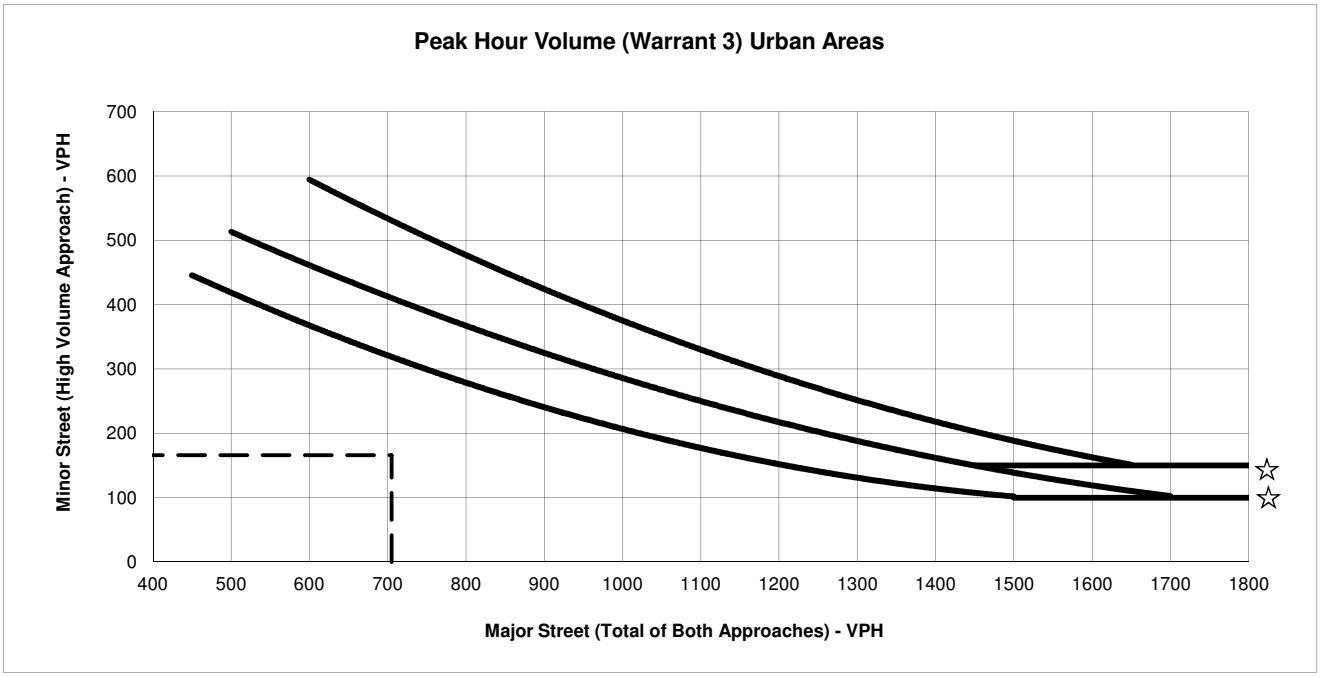
Flow rate, vp	1375	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Appendix D: Signal Warrant Analysis Worksheets

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

Existing AM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	705
Minor St. Volume:	166
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
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1500	100	1500	145	1500	180
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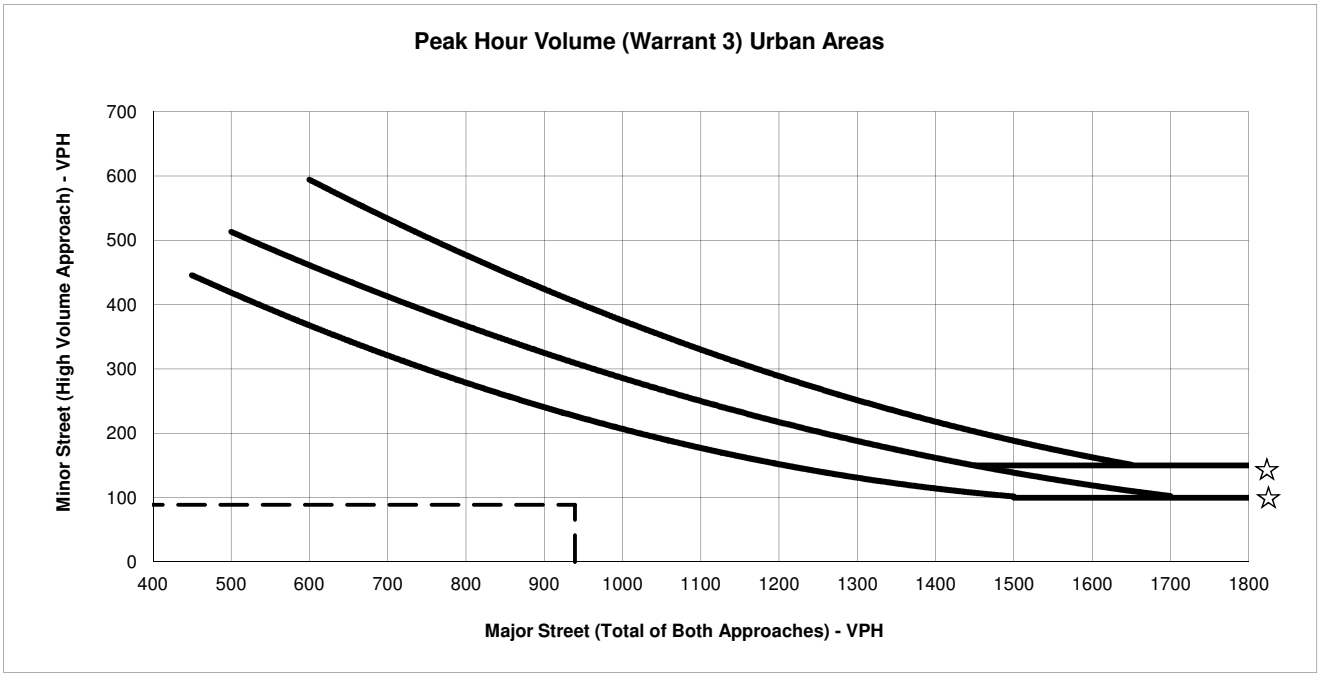

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Existing PM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	939
Minor St. Volume:	89
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
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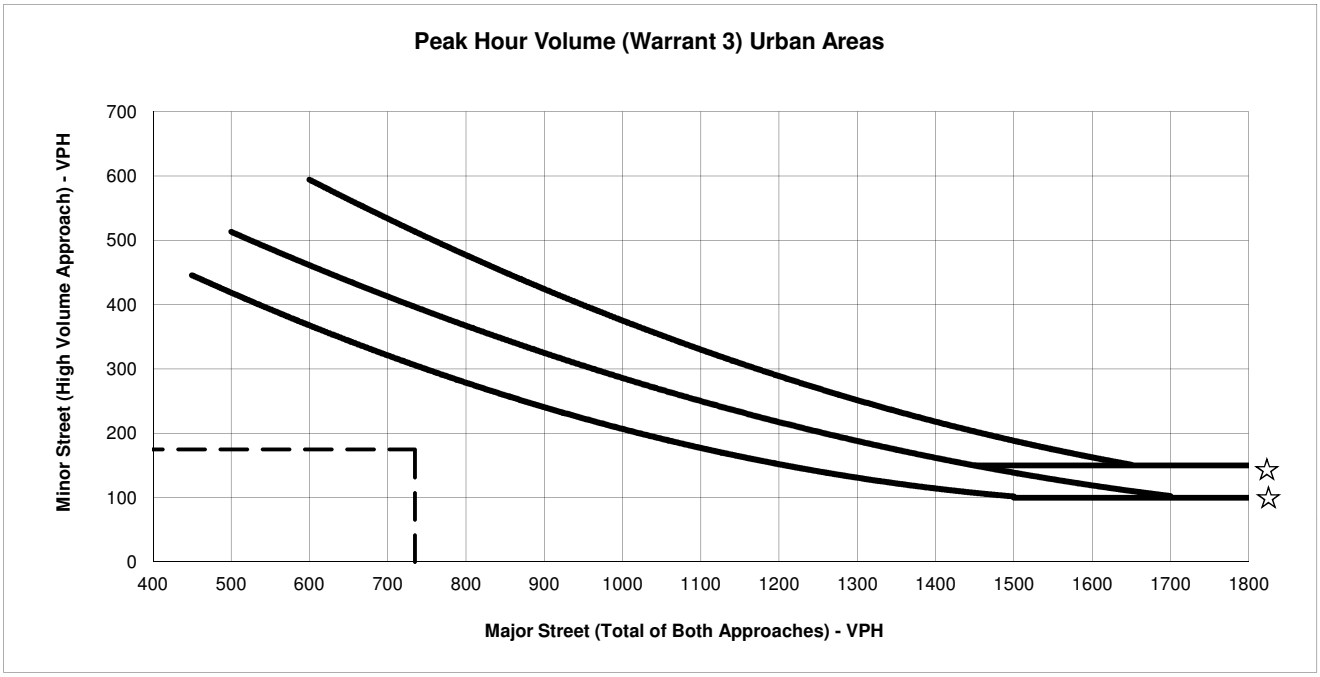

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Existing Plus Projet AM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	735
Minor St. Volume:	175
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
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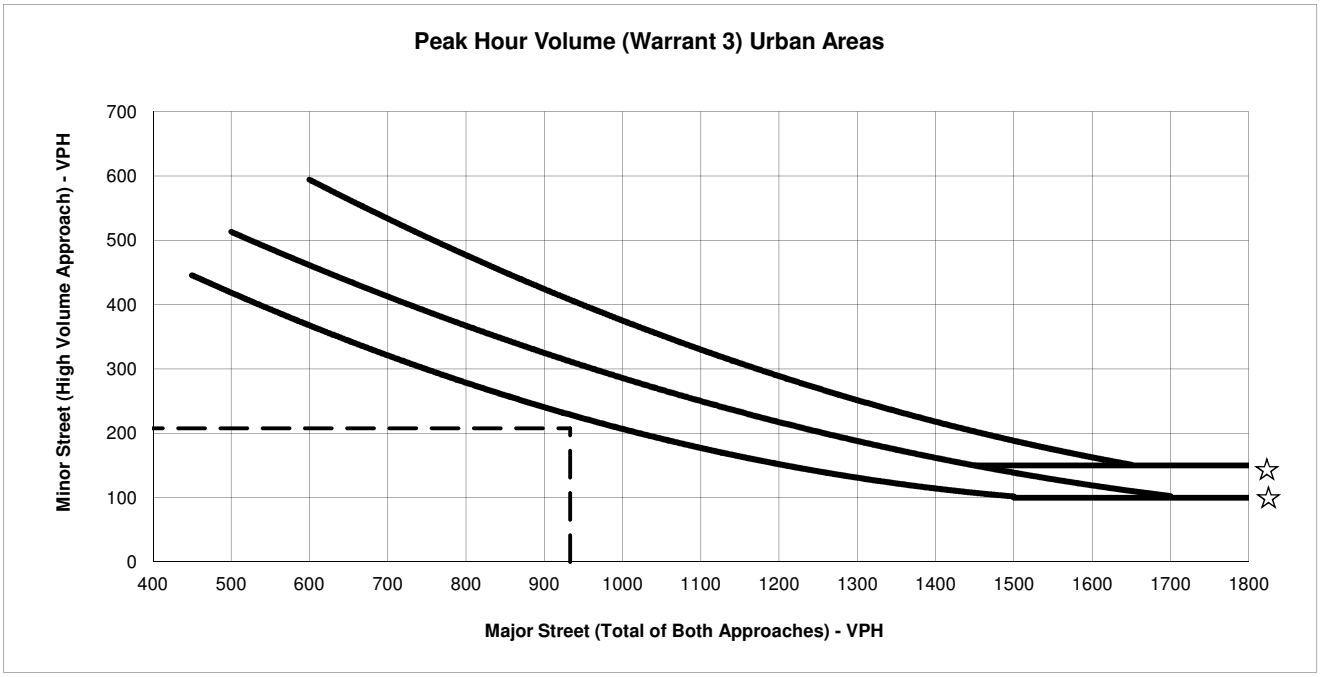

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Existing Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	933
Minor St. Volume:	208
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
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900	245	900	325	900	425
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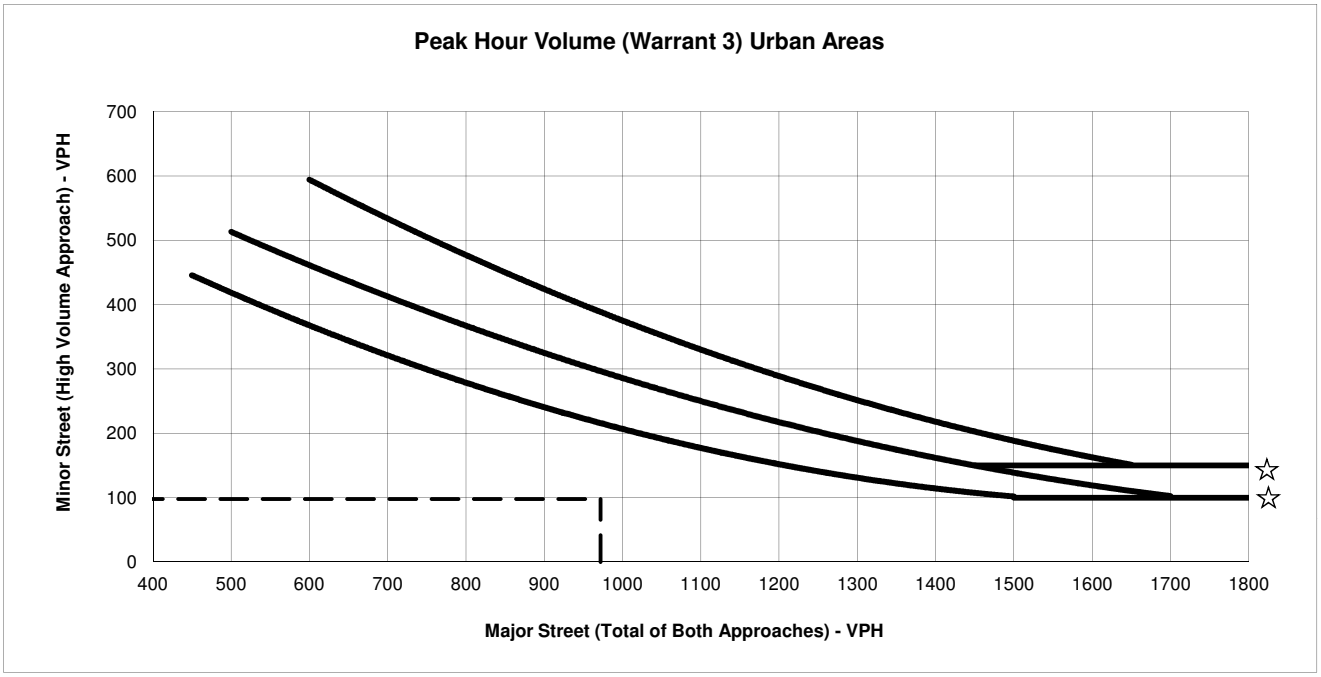

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Existing Plus Projet PM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	972
Minor St. Volume:	98
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
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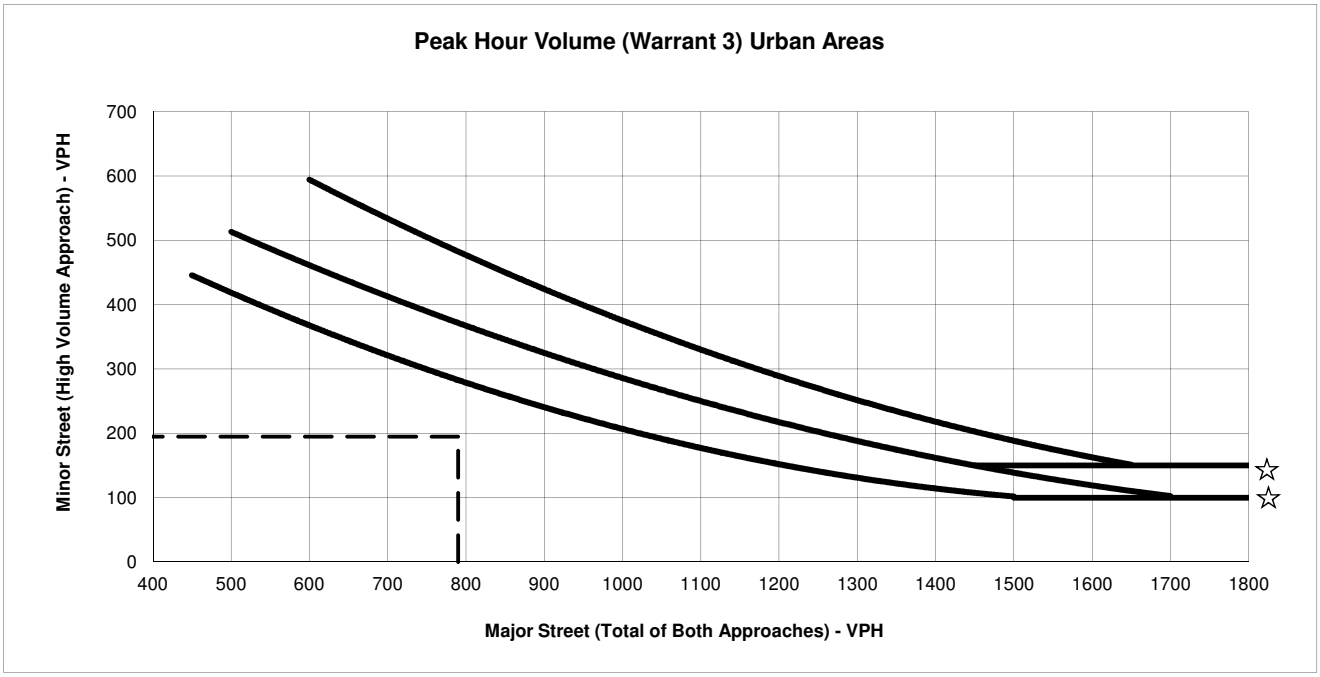

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Year 2020 AM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	790
Minor St. Volume:	195
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
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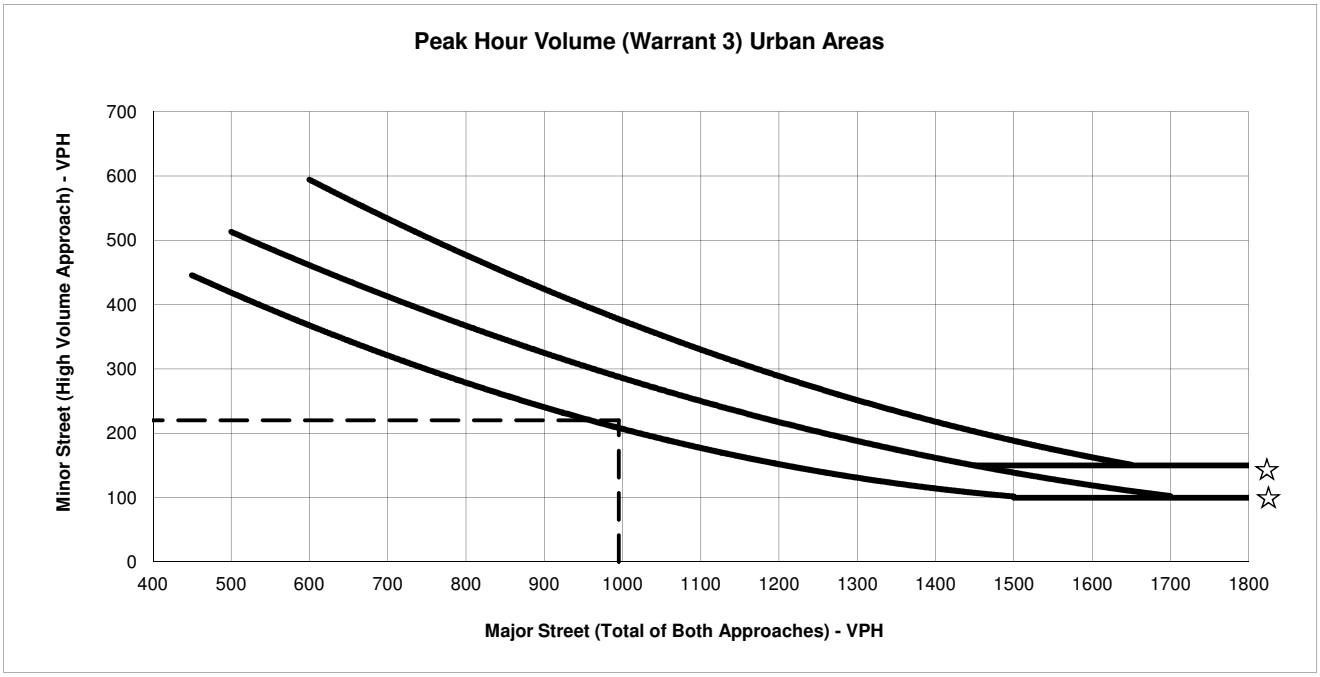

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Year 2020 PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	995
Minor St. Volume:	220
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
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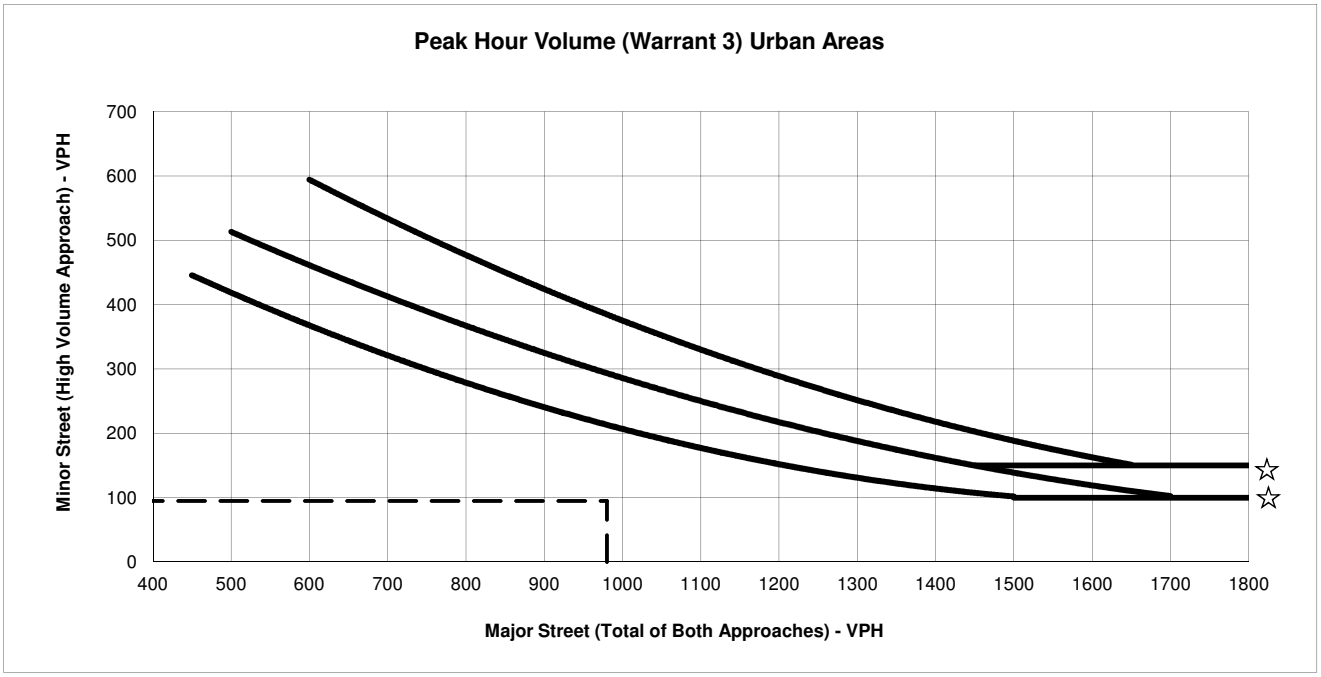

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Year 2020 PM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	980
Minor St. Volume:	95
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
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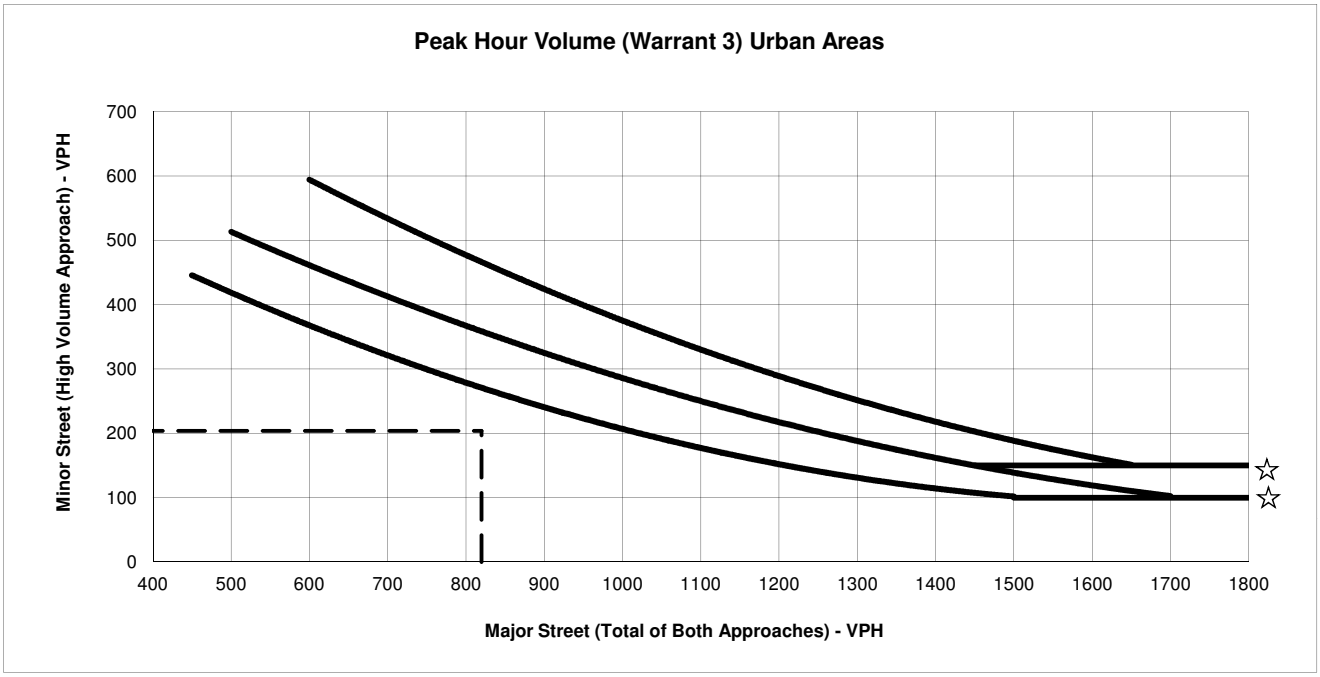

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Year 2020 Plus Project AM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	820
Minor St. Volume:	204
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
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1700	100	1700	100	1650	150
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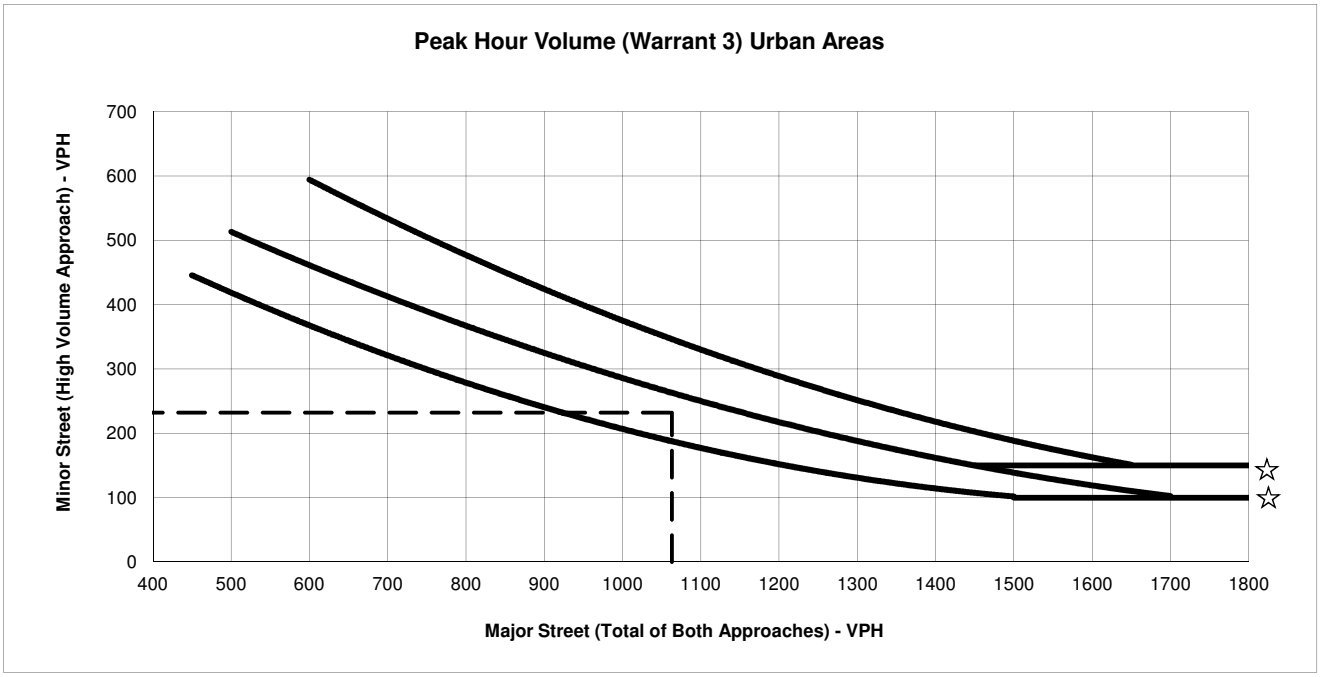

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Year 2020 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	1063
Minor St. Volume:	232
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
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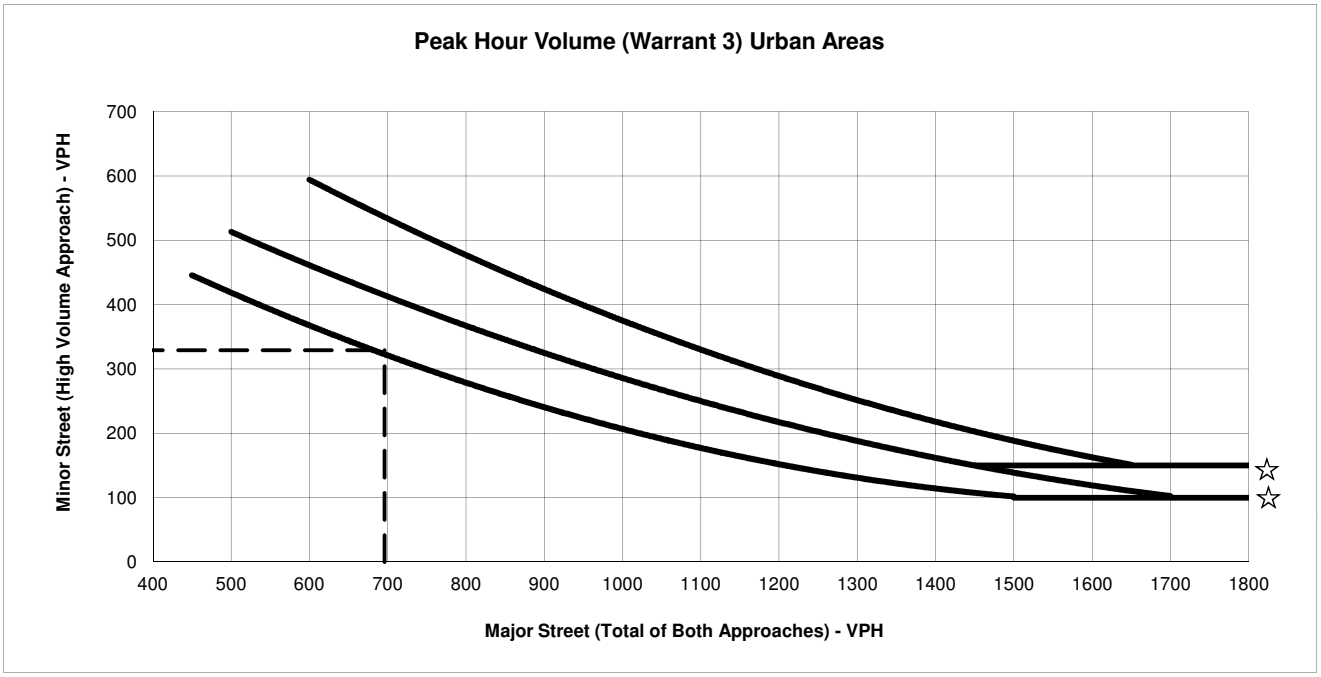

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Year 2020 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Rancho Road	1

Major St. Volume:	696
Minor St. Volume:	329
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
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900	245	900	325	900	425
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1400	120	1400	155	1400	220
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1700	100	1700	100	1650	150
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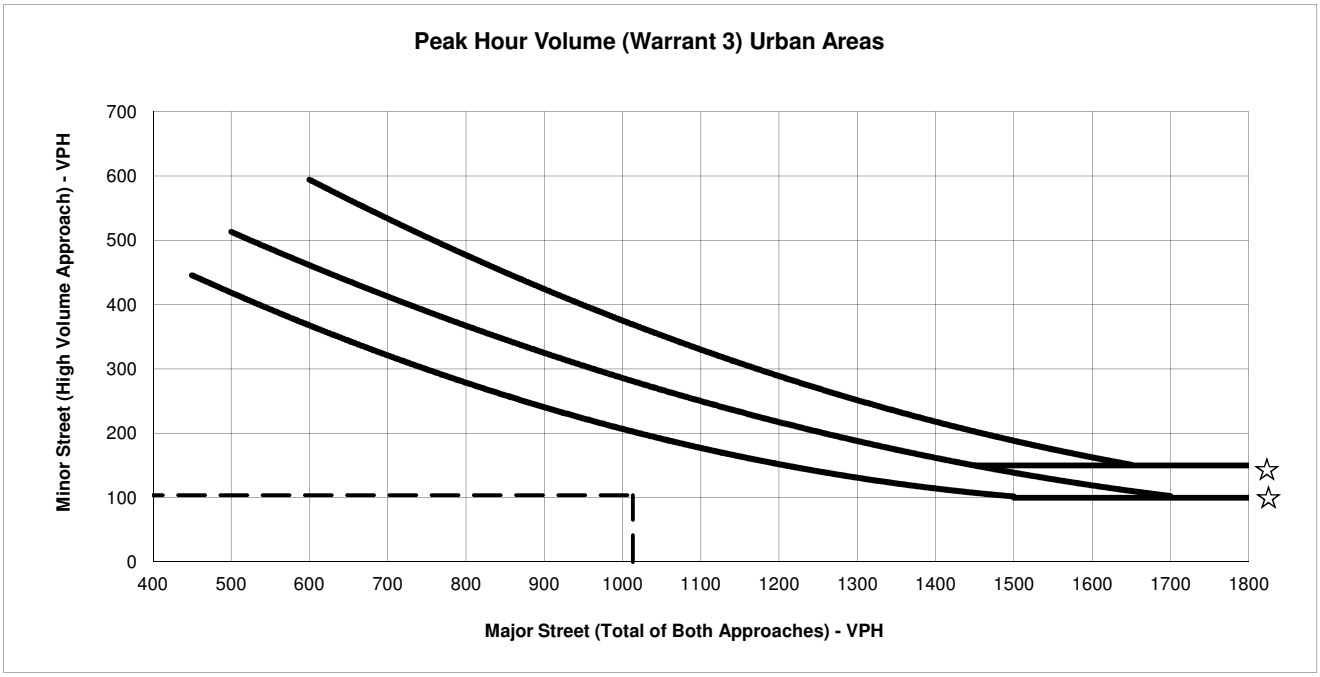

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Year 2020 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	1013
Minor St. Volume:	104
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
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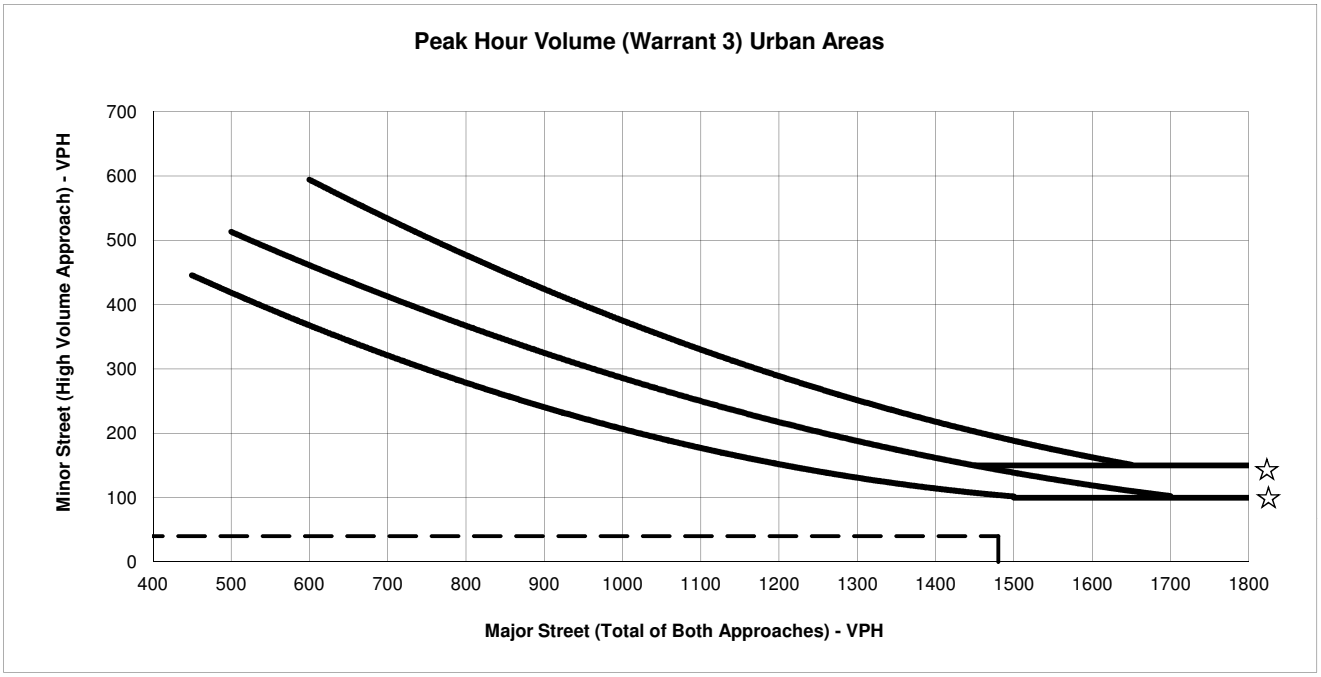


☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

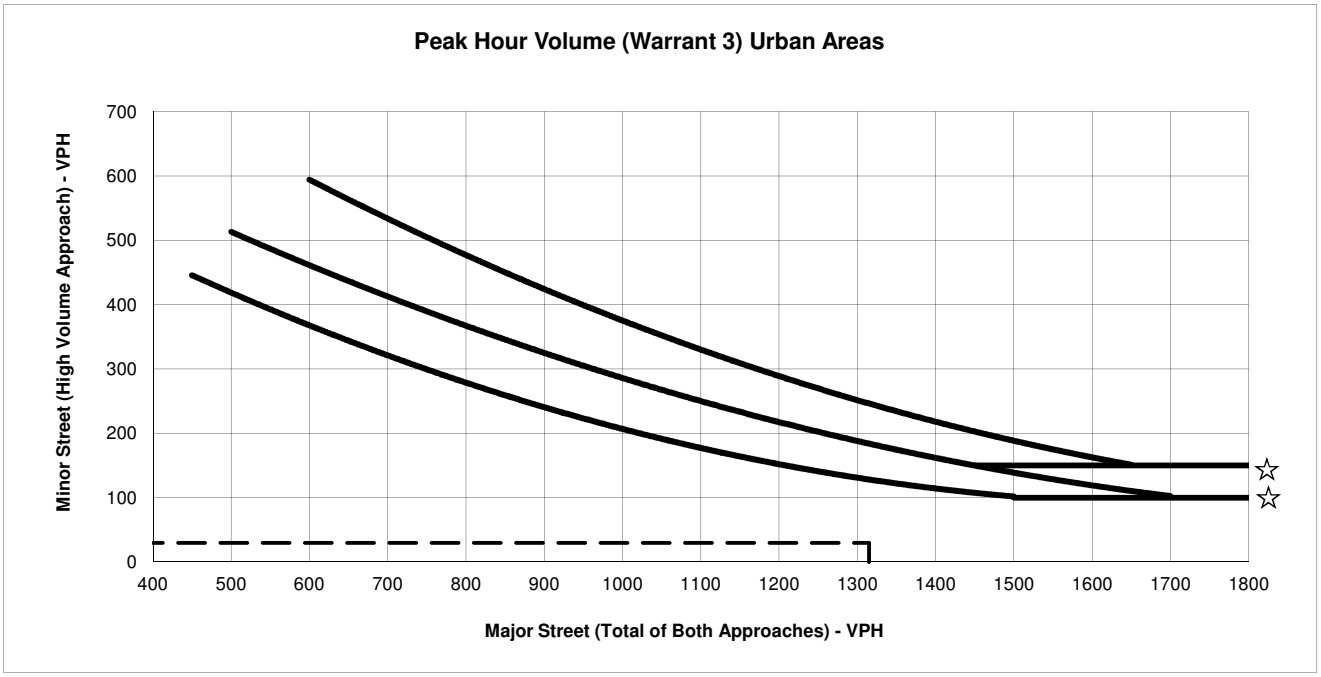
Year 2040 AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Hartmeyer Lane	1

Major St. Volume:	1480
Minor St. Volume:	40
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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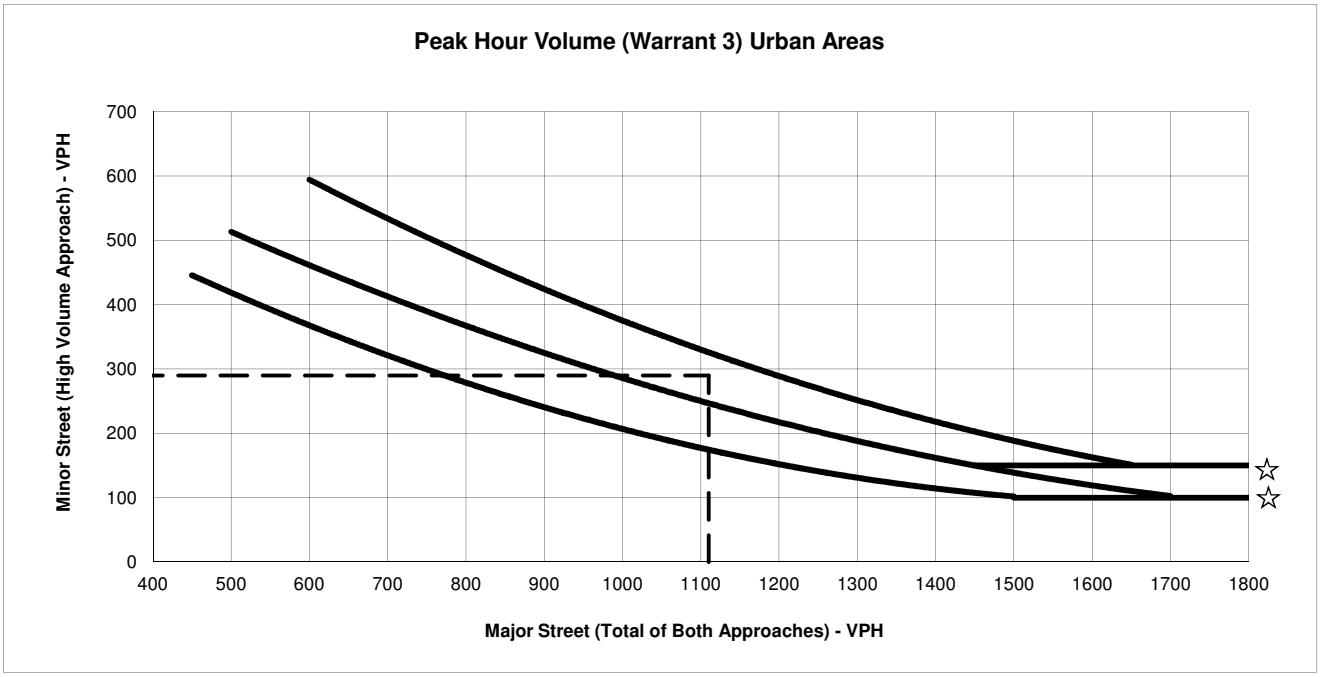
Year 2040 AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Huntington Drive	1

Major St. Volume:	1315
Minor St. Volume:	30
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Year 2040 AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	1110
Minor St. Volume:	290
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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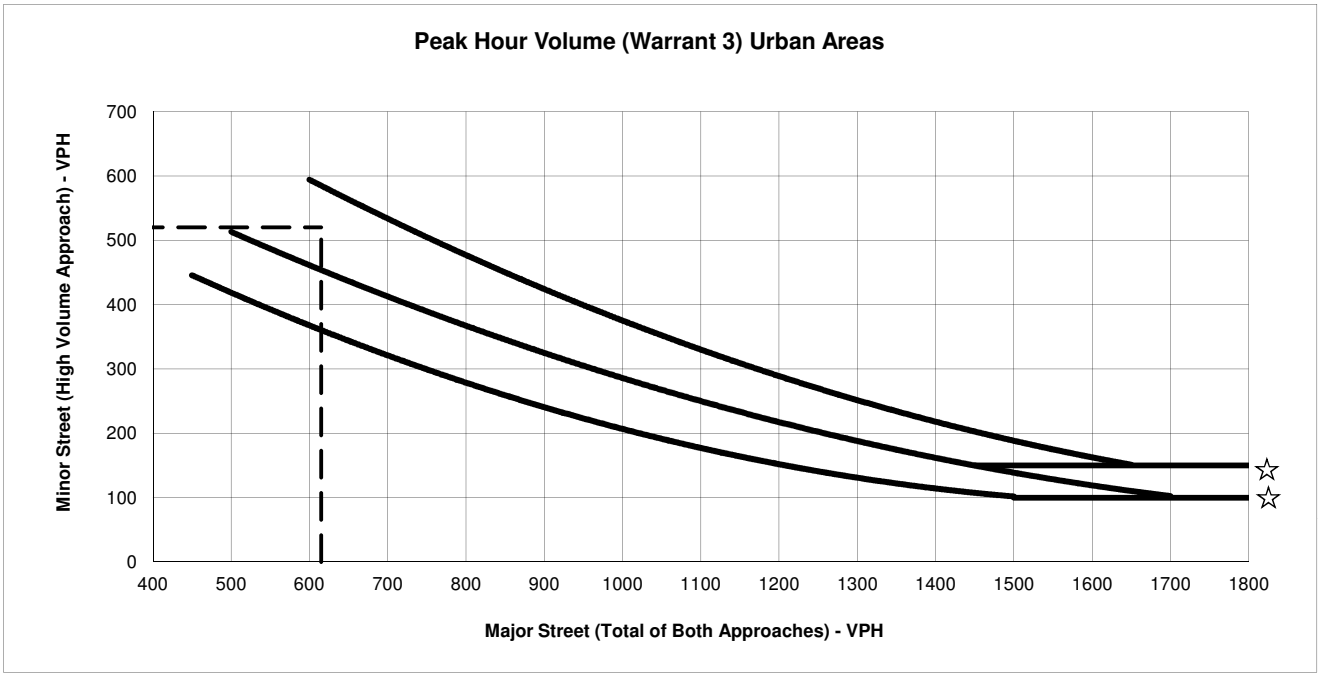

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Year 2040 AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Rancho Road	1

Major St. Volume:	615
Minor St. Volume:	520
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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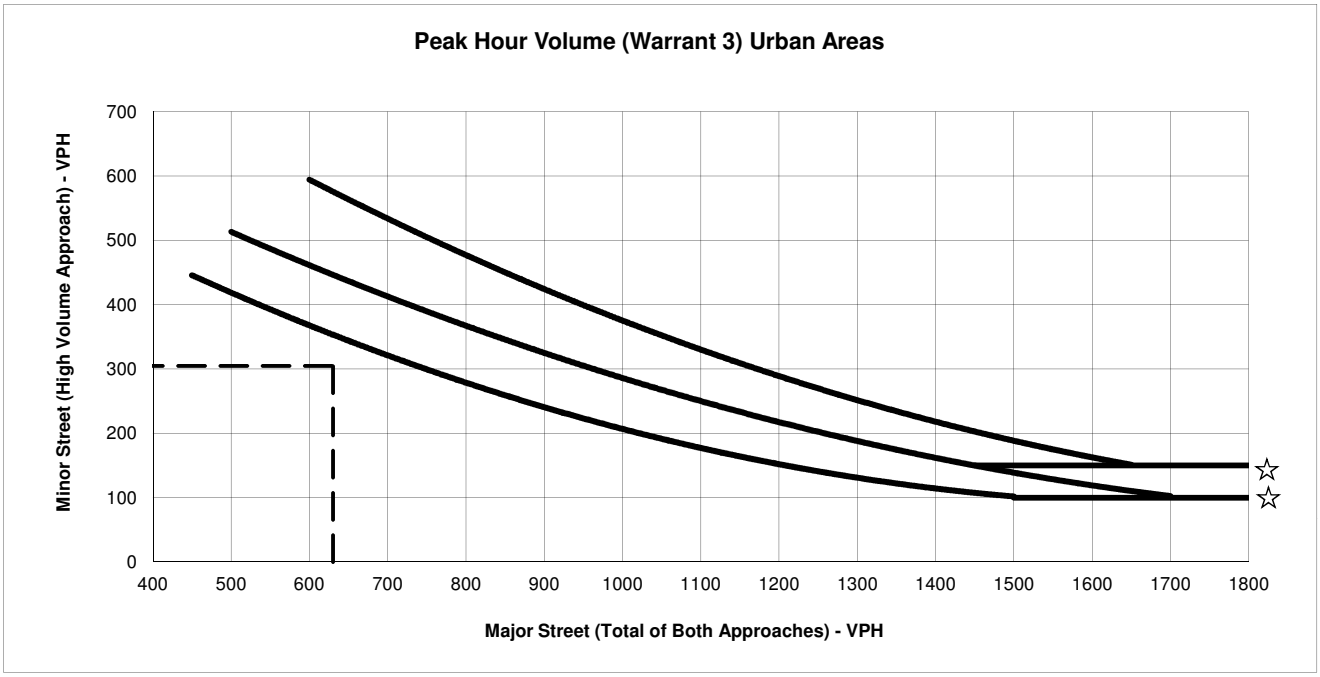

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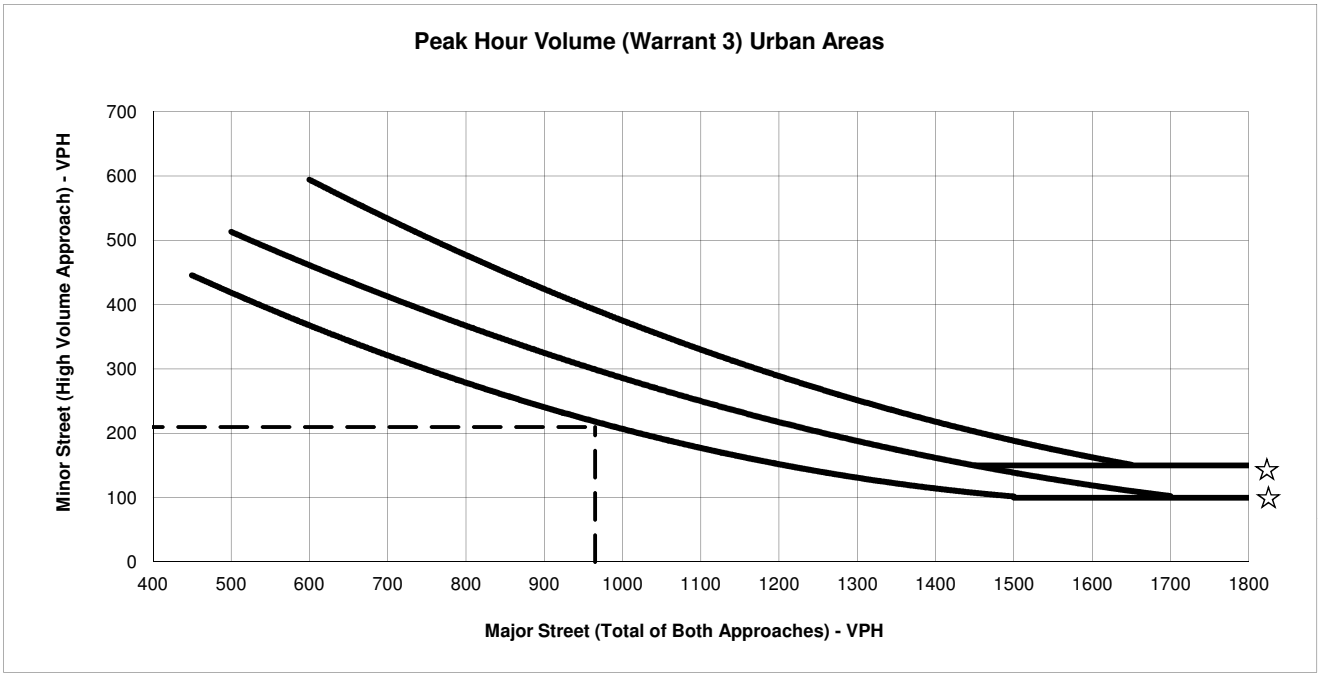
Year 2040 AM Peak Hour

		Number of Lanes
Major Approach	Rancho Road	1
Minor Approach	Shasta View Drive	1

Major St. Volume:	630
Minor St. Volume:	305
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Year 2040 AM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	965
Minor St. Volume:	210
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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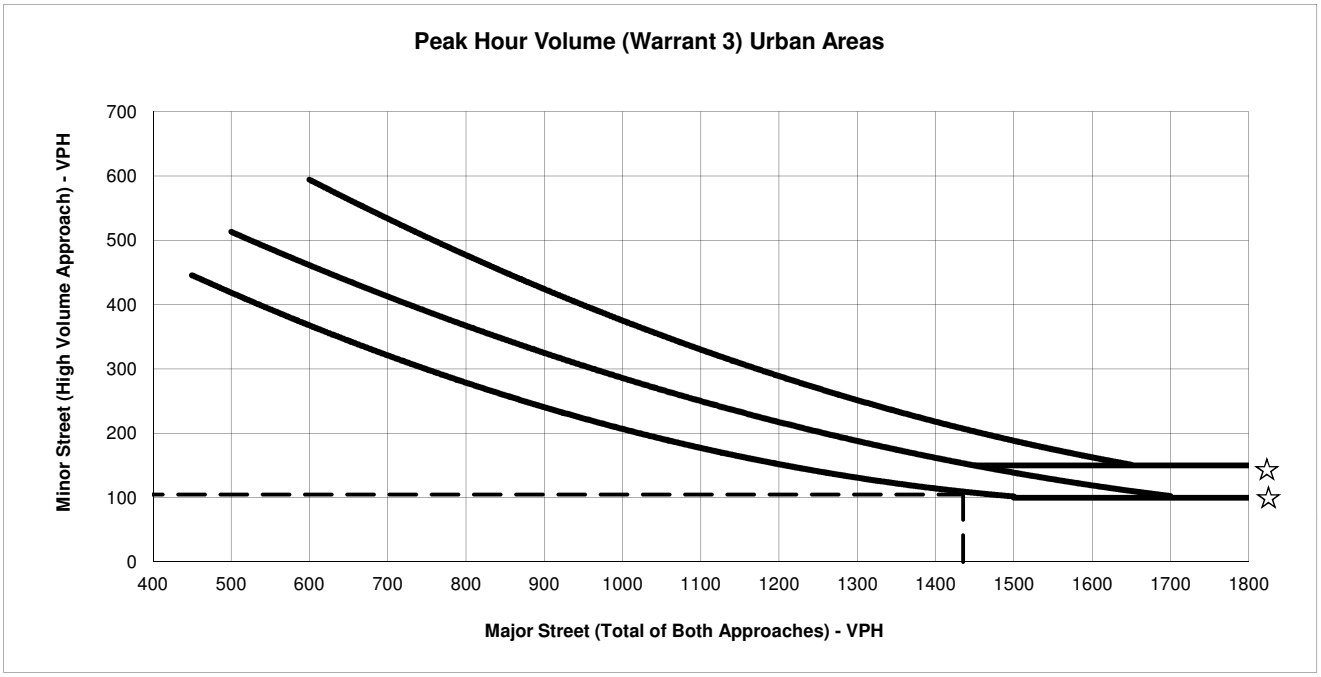

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Year 2040 PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Hartmeyer Lane	1

Major St. Volume:	1435
Minor St. Volume:	105
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
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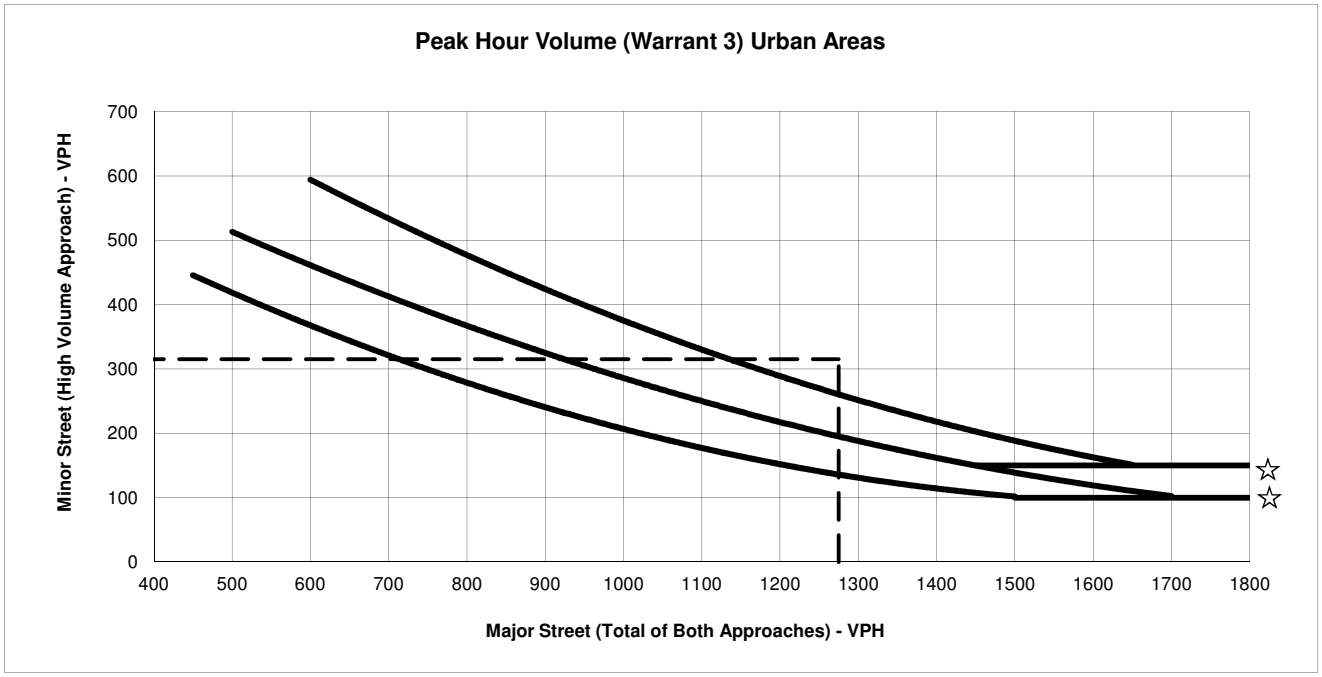
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Year 2040 PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	1275
Minor St. Volume:	315
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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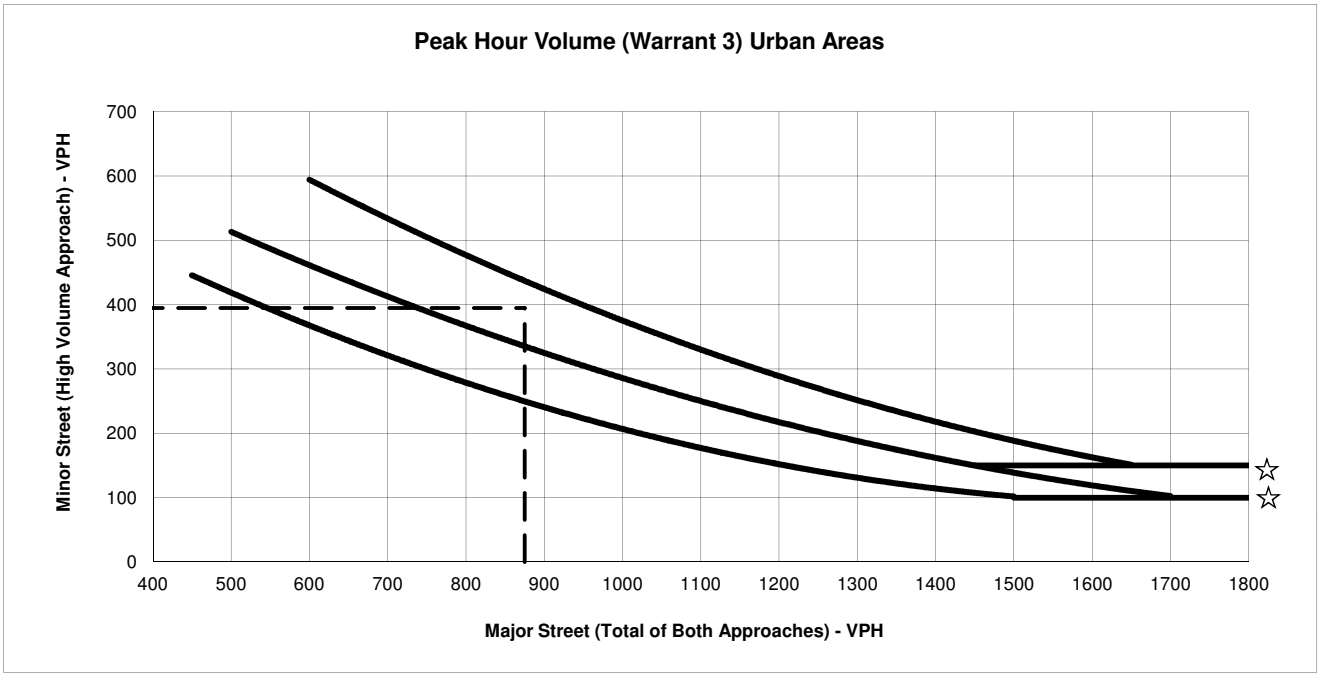

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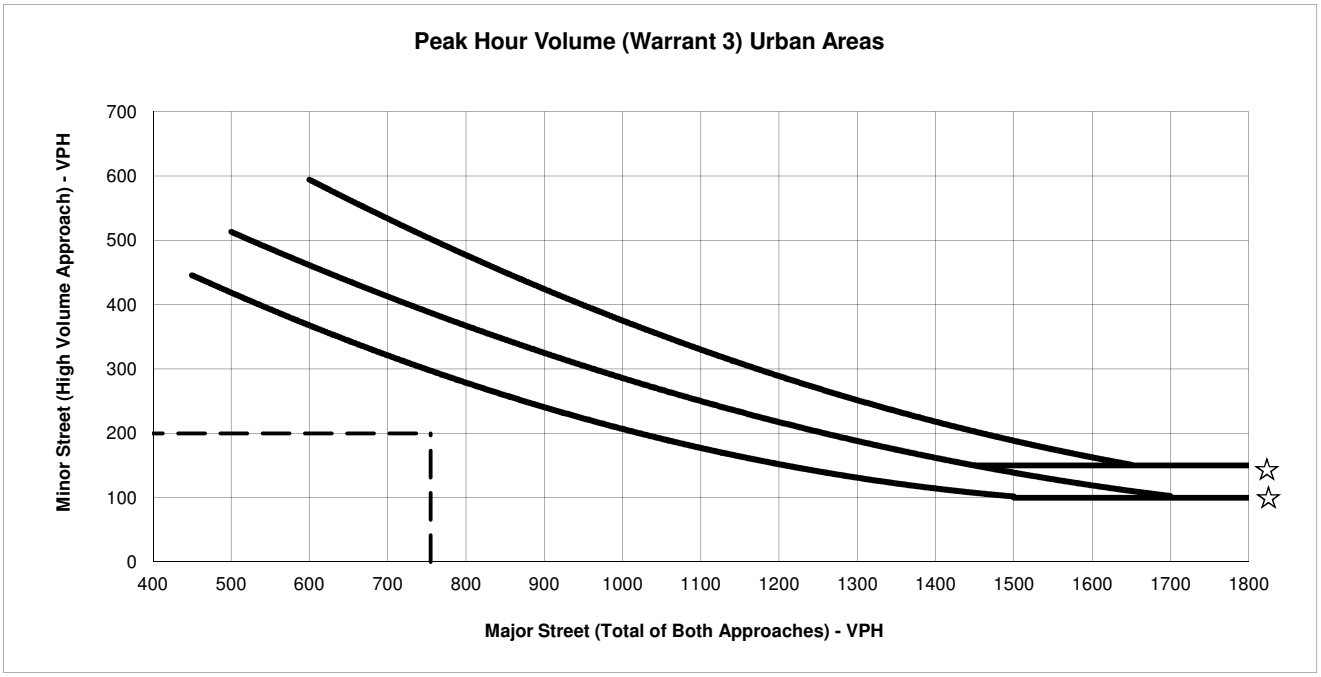
Year 2040 PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Rancho Road	1

Major St. Volume:	875
Minor St. Volume:	395
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Year 2040 PM Peak Hour

		Number of Lanes
Major Approach	Rancho Road	1
Minor Approach	Shasta View Drive	1

Major St. Volume:	755
Minor St. Volume:	200
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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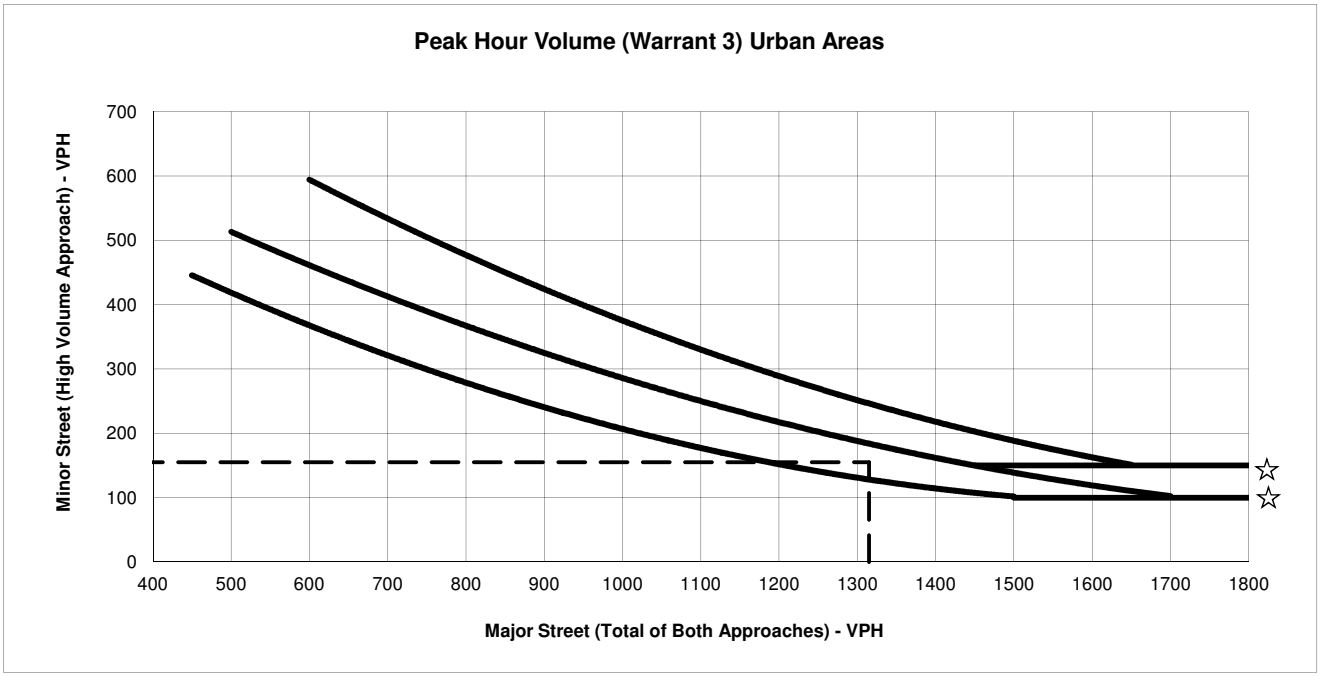

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Year 2040 PM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	1315
Minor St. Volume:	155
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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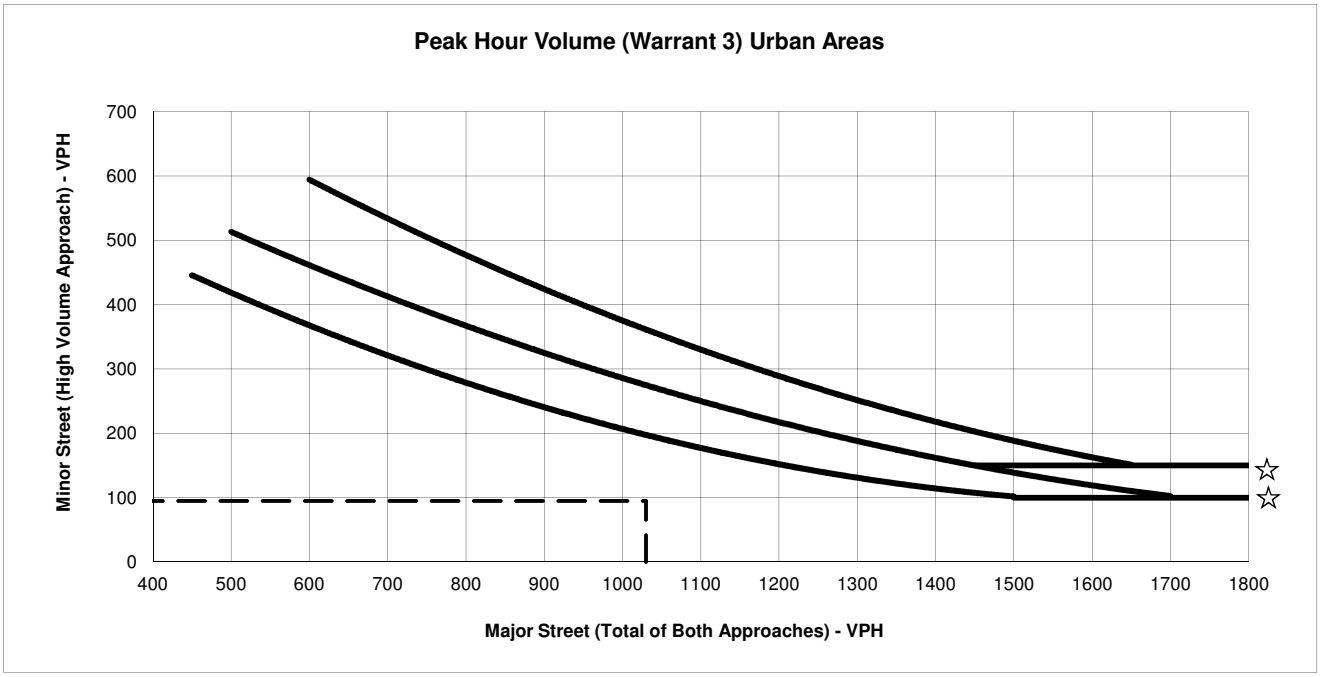

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Year 2040 Saturday Mid-day Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Huntington Drive	1

Major St. Volume:	1030
Minor St. Volume:	95
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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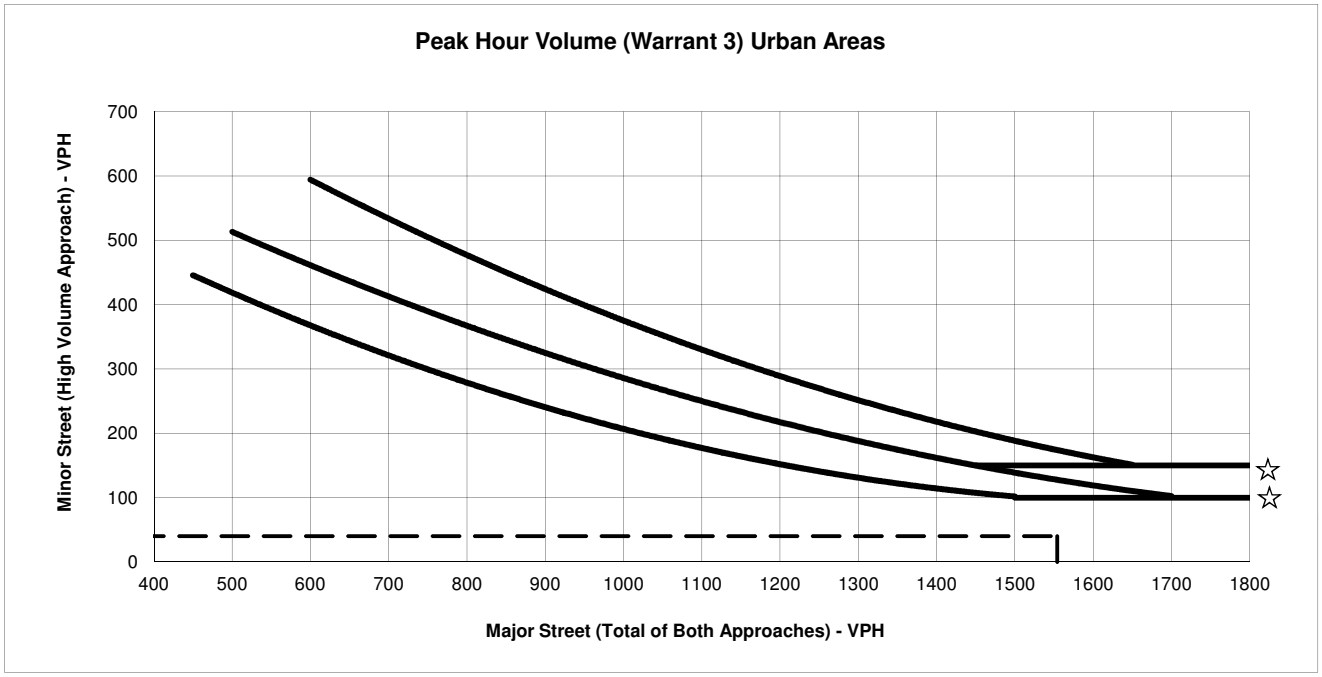

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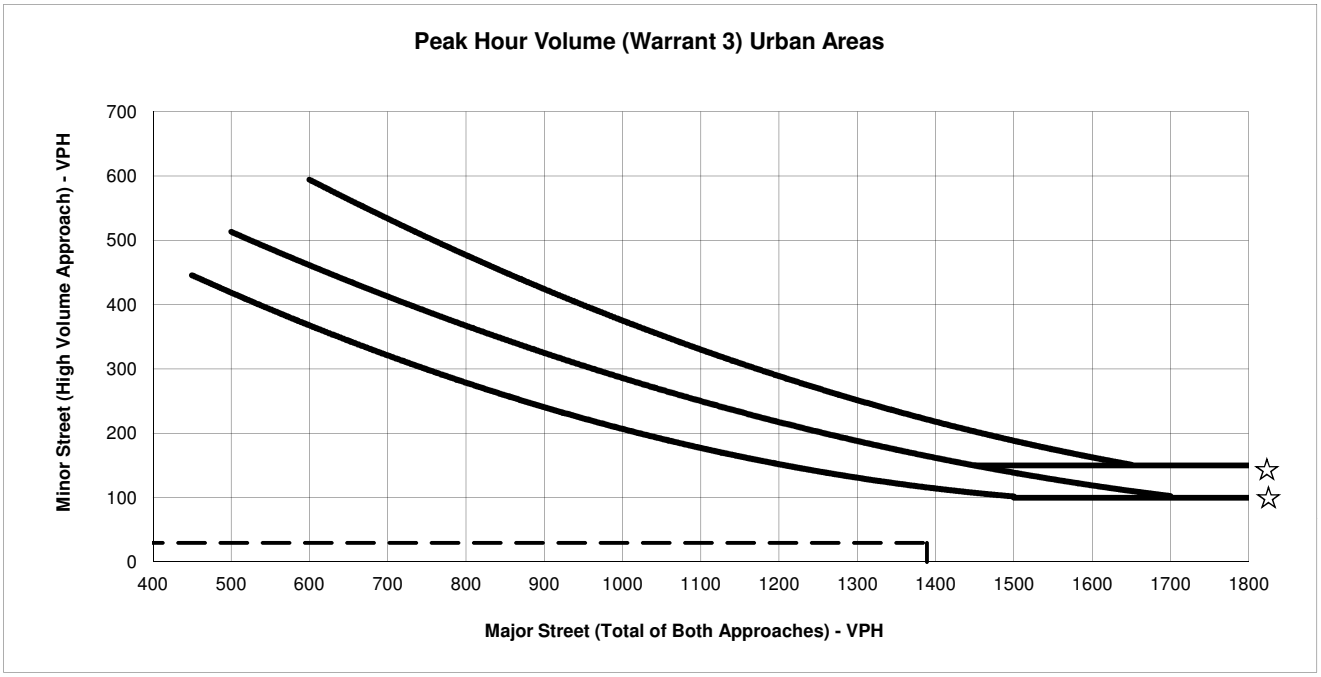
Year 2040 Plus Project AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Hartmeyer Lane	1

Major St. Volume:	1554
Minor St. Volume:	40
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Year 2040 Plus Project AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Huntington Drive	1

Major St. Volume:	1389
Minor St. Volume:	30
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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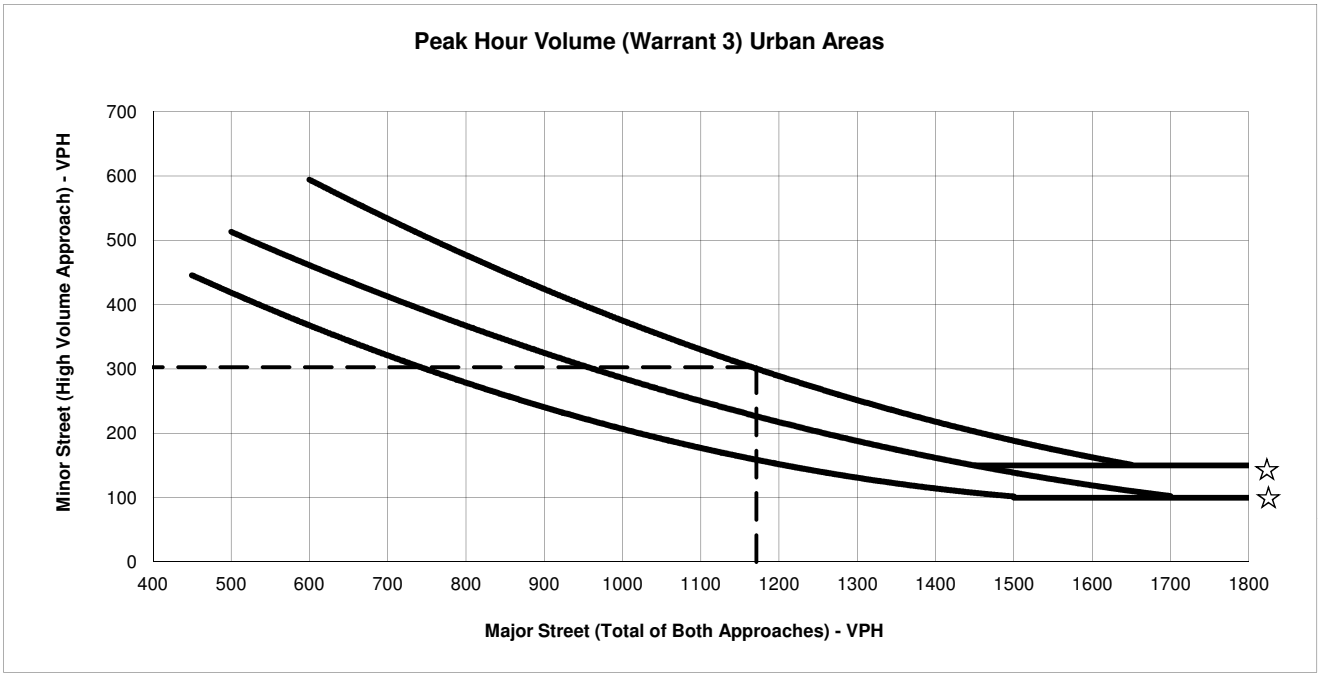

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150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

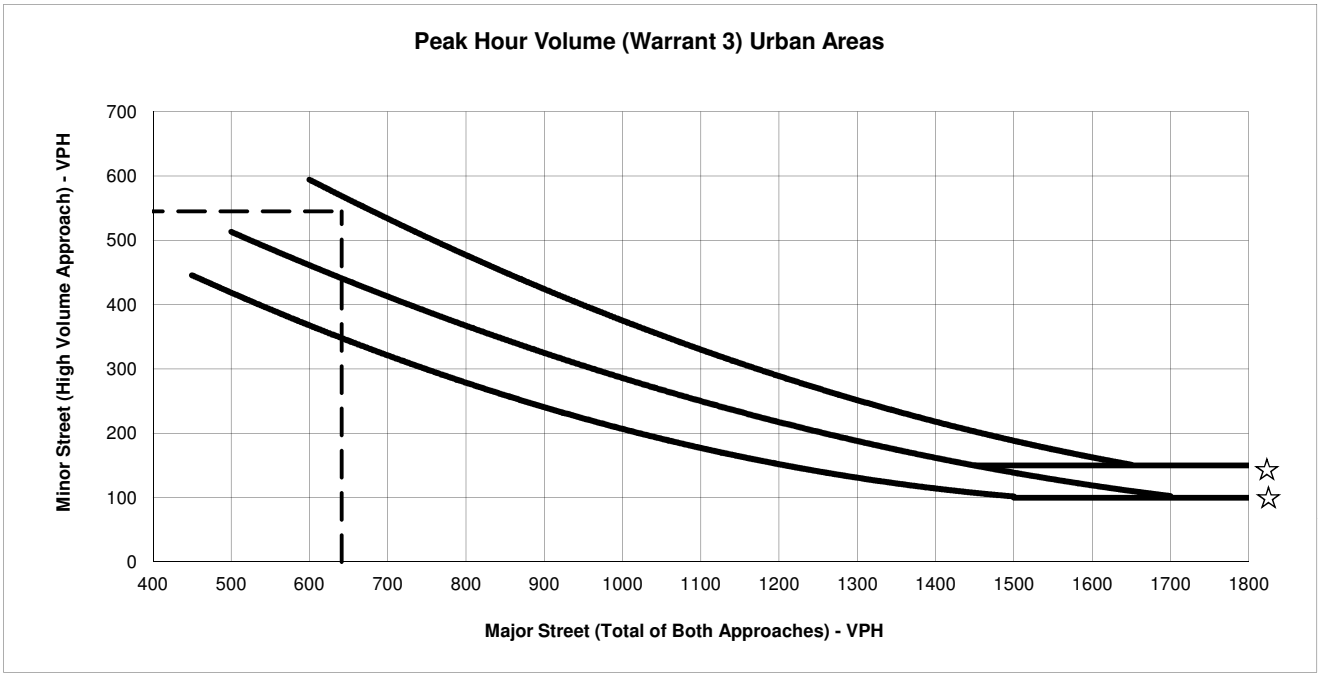
Year 2040 Plus Project AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	1171
Minor St. Volume:	303
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Year 2040 Plus Project AM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Rancho Road	1

Major St. Volume:	641
Minor St. Volume:	545
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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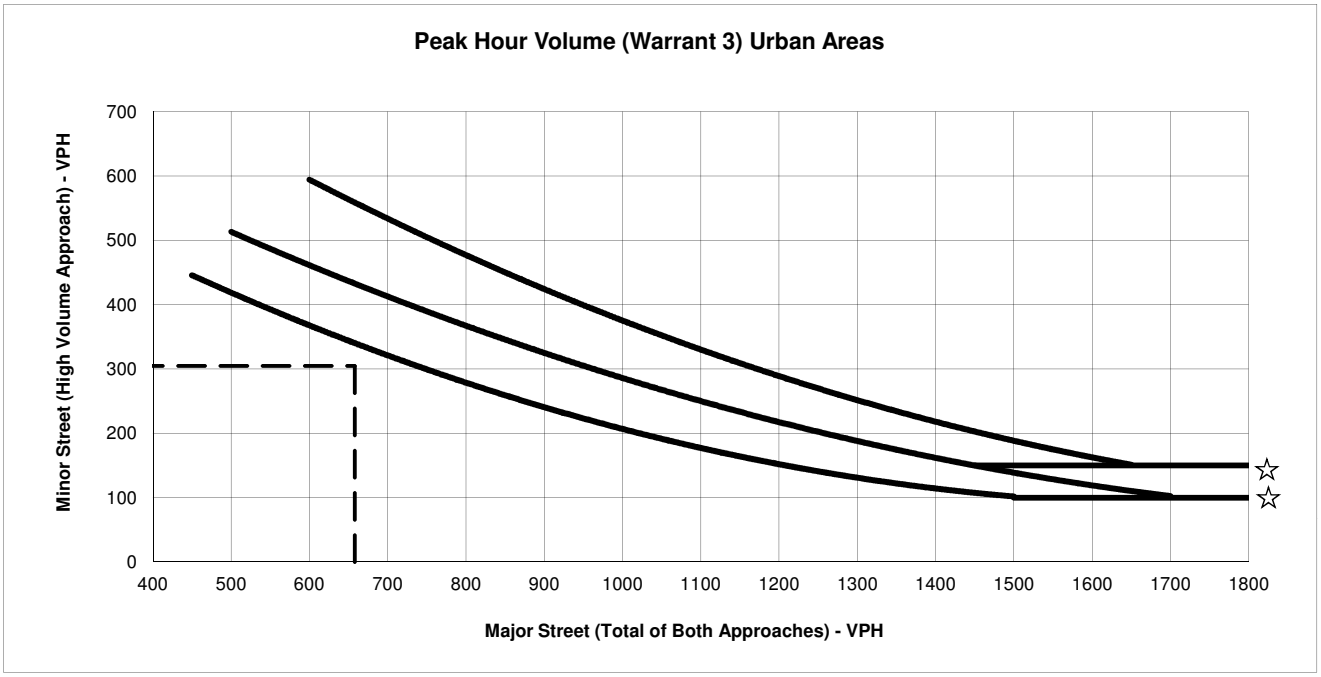

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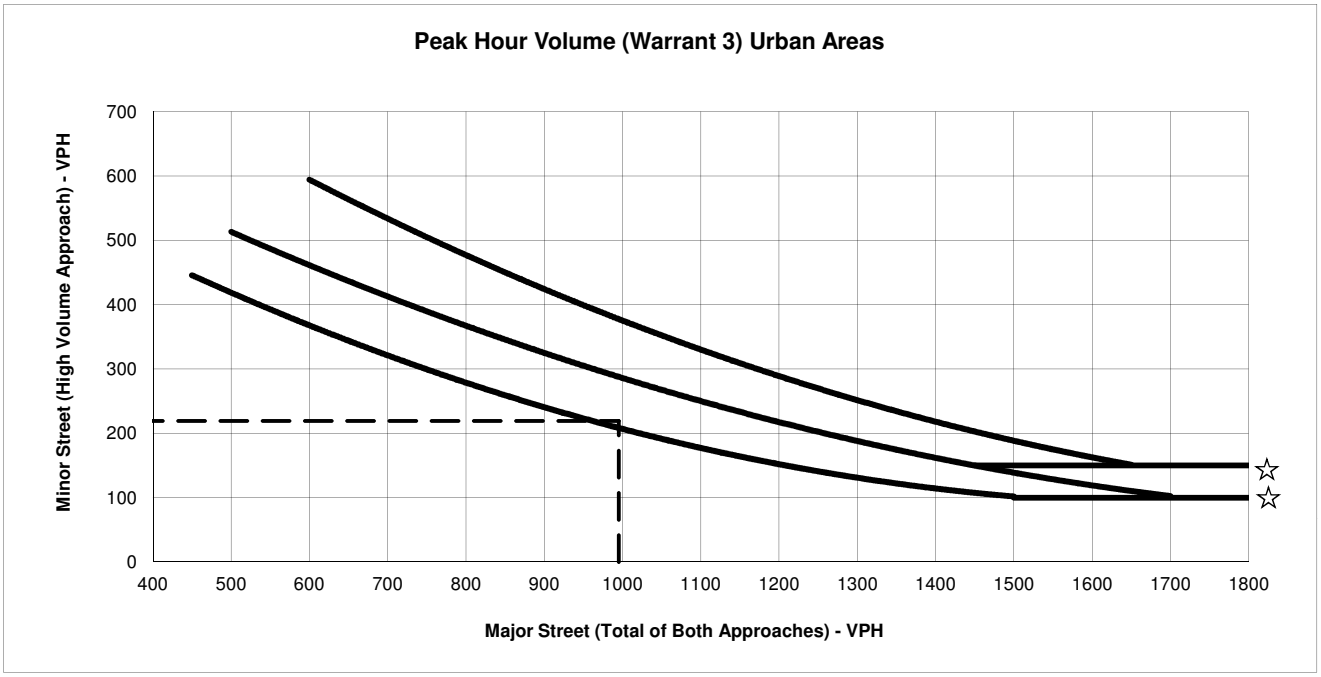
Year 2040 Plus Project AM Peak Hour

		Number of Lanes
Major Approach	Rancho Road	1
Minor Approach	Shasta View Drive	1

Major St. Volume:	658
Minor St. Volume:	305
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Year 2040 Plus Project AM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	995
Minor St. Volume:	219
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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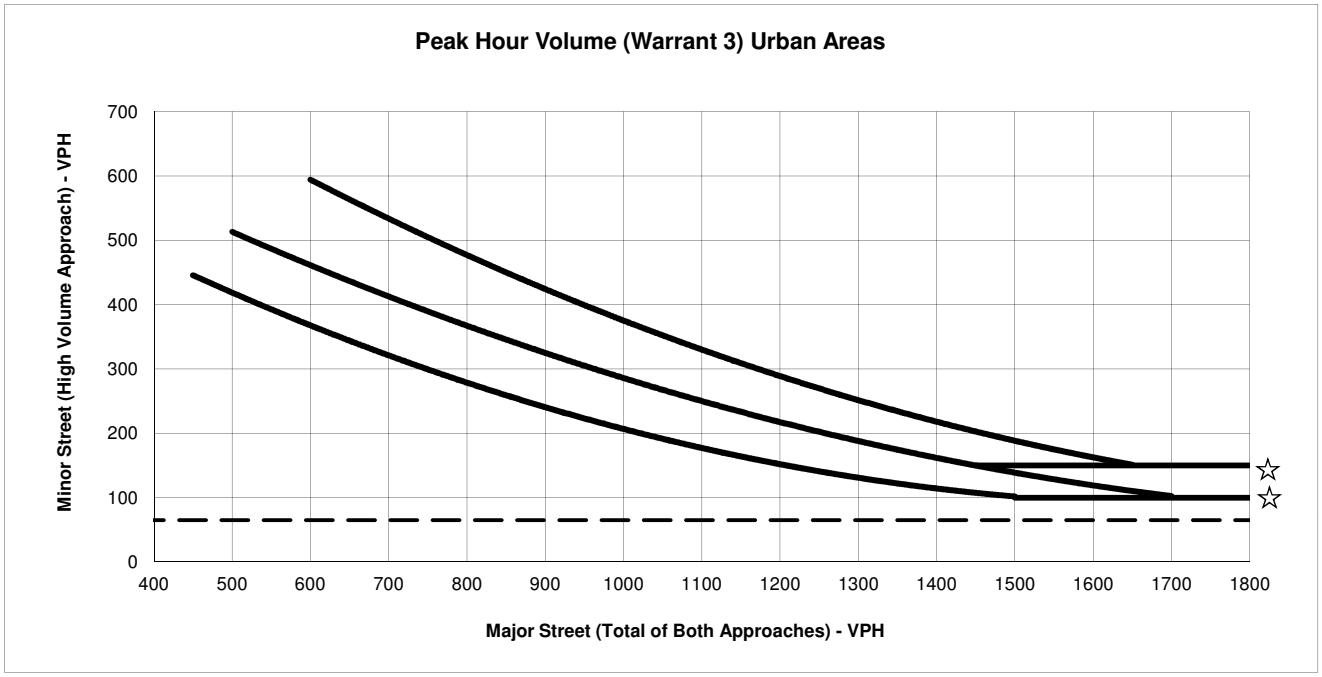

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Year 2040 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	S. Bonnyview Rd	3
Minor Approach	Project Dwy #4/ Texaco	1

Major St. Volume:	4002
Minor St. Volume:	65
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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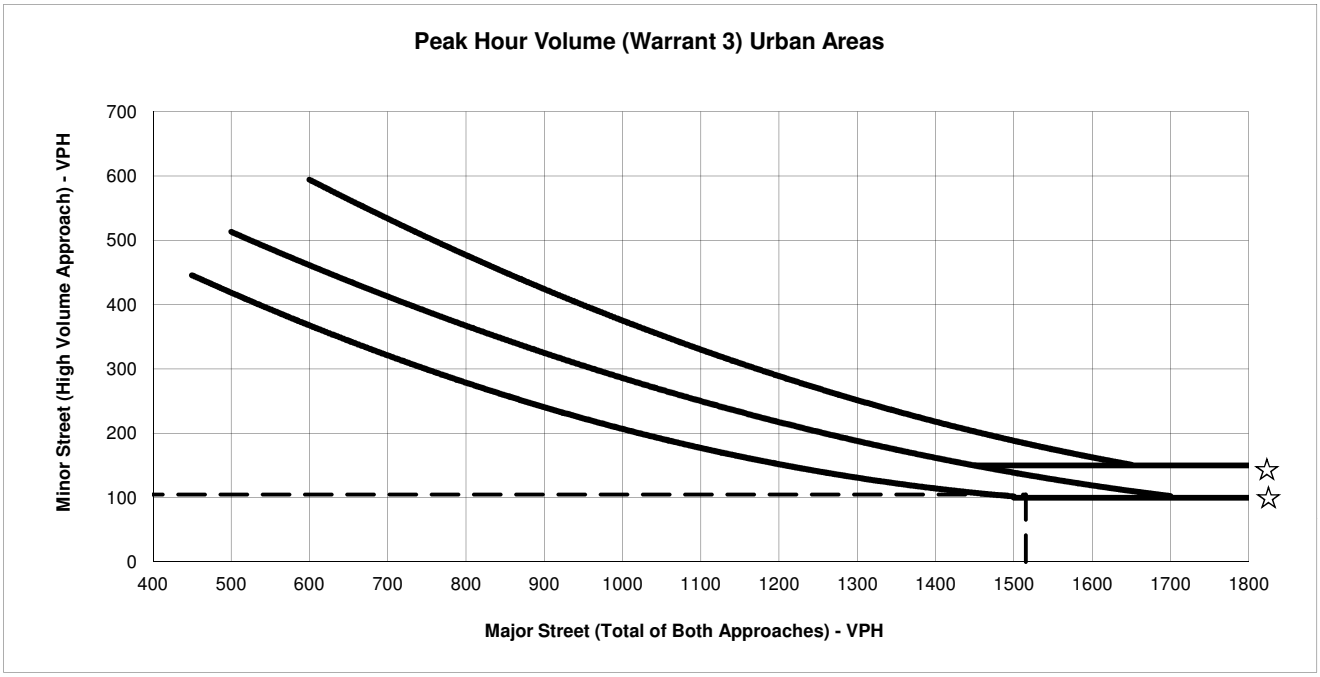

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Year 2040 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Hartmeyer Lane	1

Major St. Volume:	1515
Minor St. Volume:	105
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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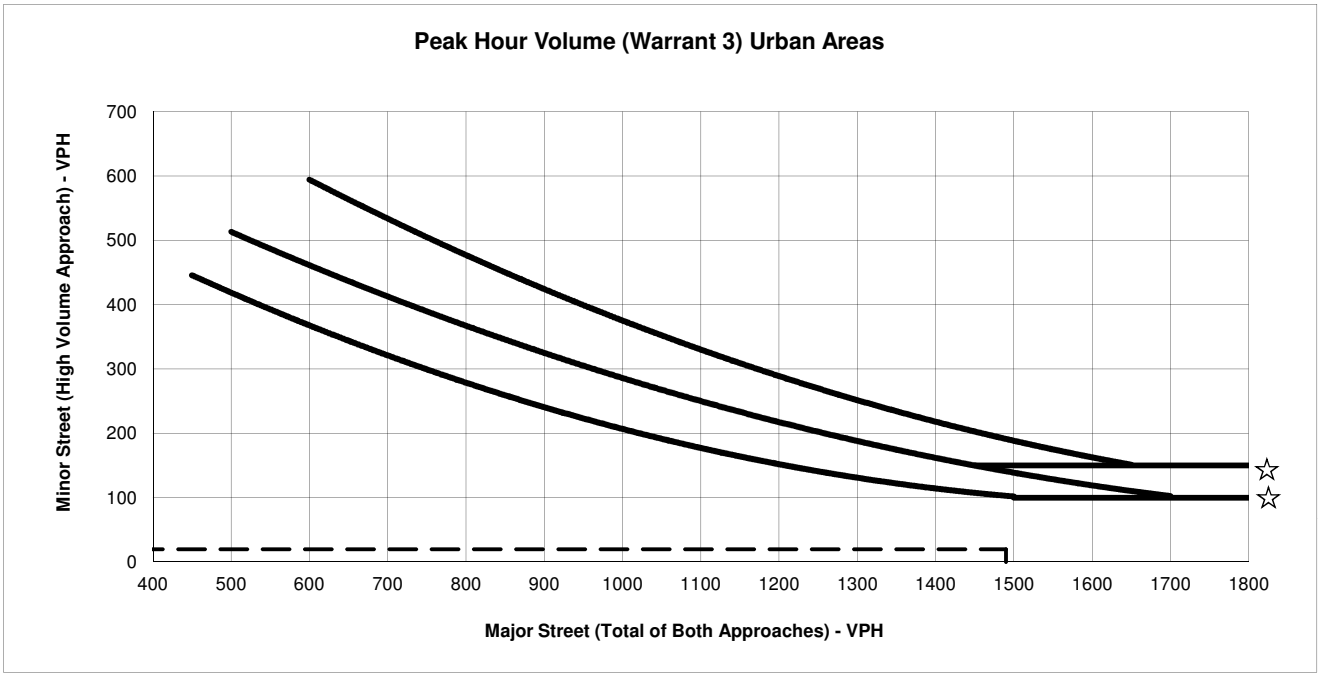

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Year 2040 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Huntington Drive	1

Major St. Volume:	1490
Minor St. Volume:	20
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
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1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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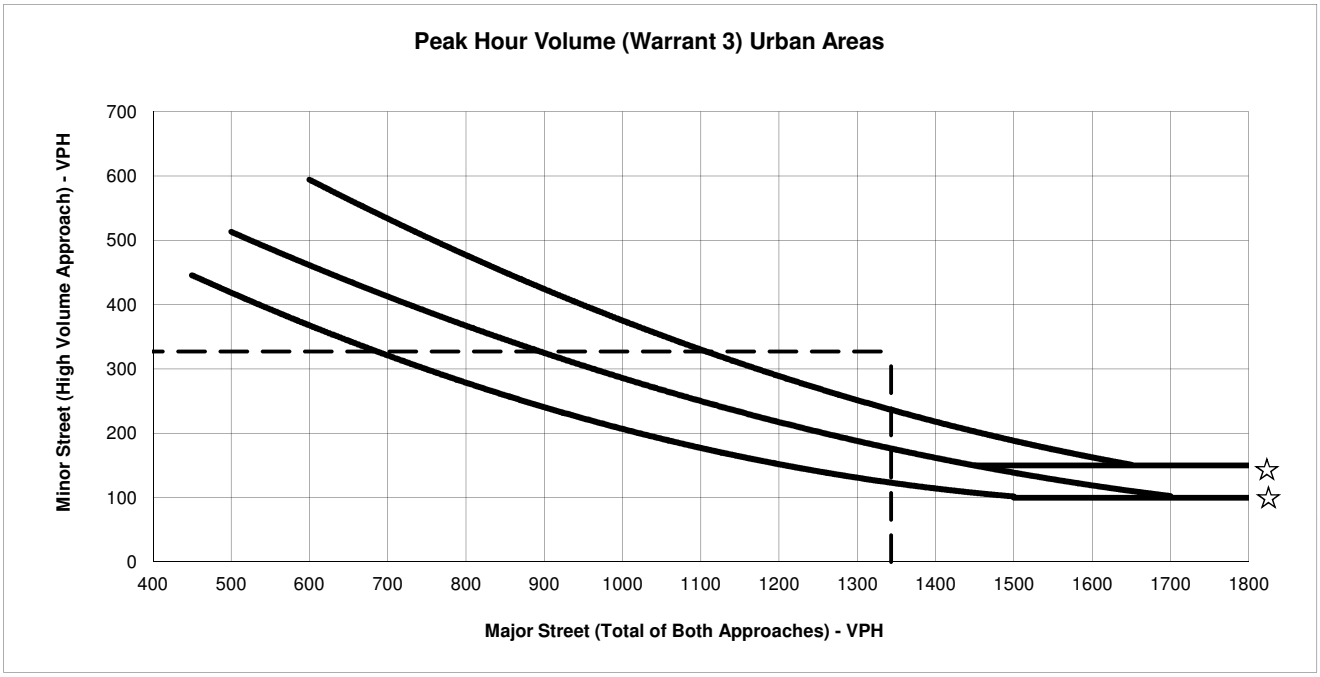

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Year 2040 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	1343
Minor St. Volume:	327
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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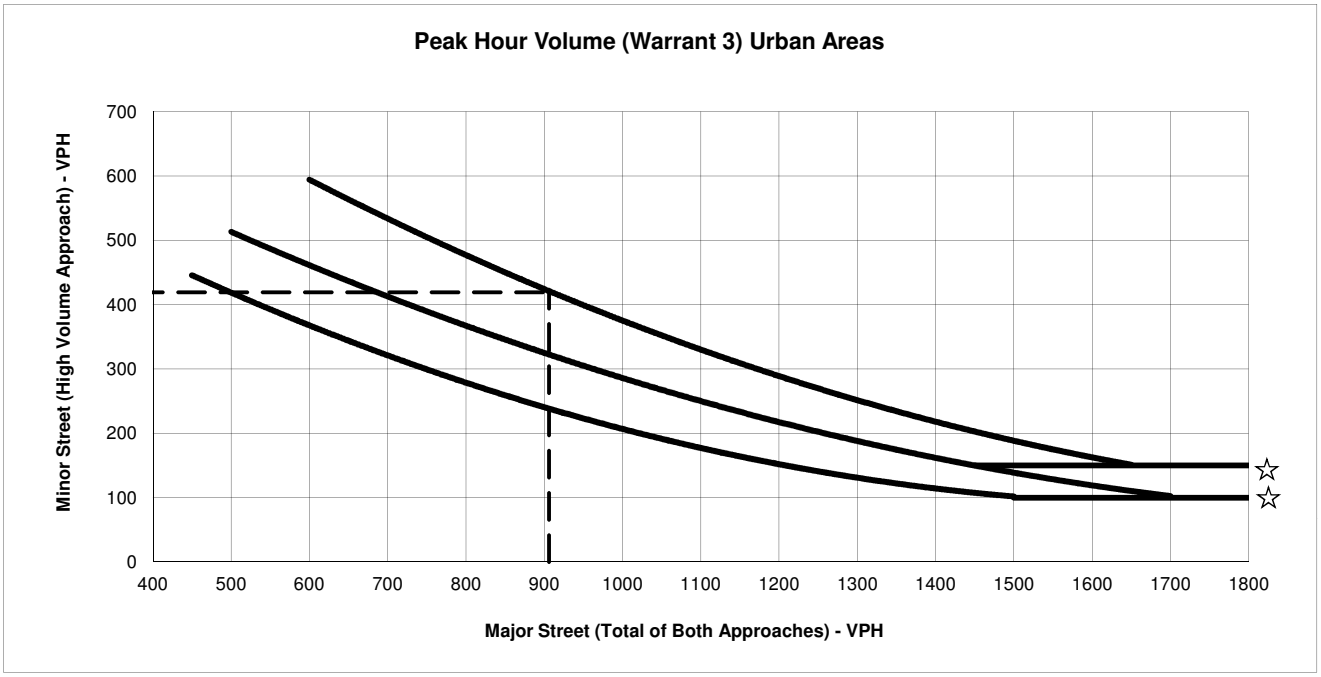

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Year 2040 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Rancho Road	1

Major St. Volume:	906
Minor St. Volume:	419
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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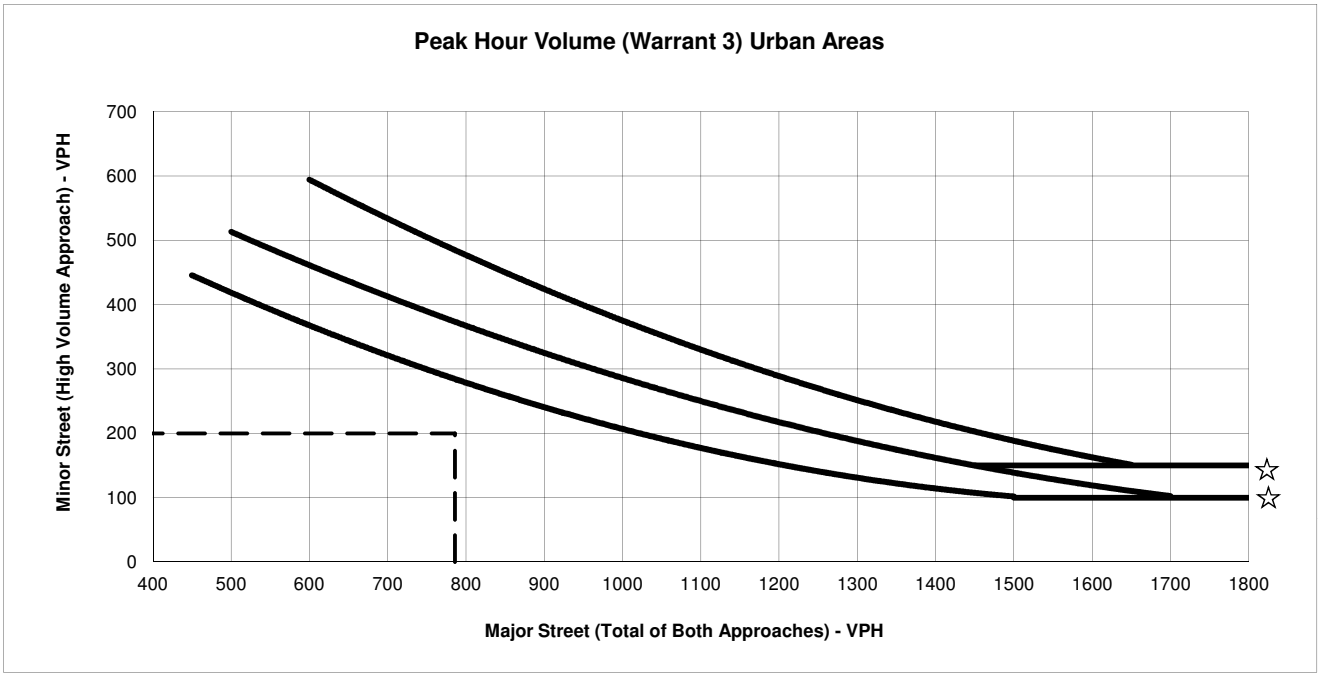

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Year 2040 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Rancho Road	1
Minor Approach	Shasta View Drive	1

Major St. Volume:	786
Minor St. Volume:	200
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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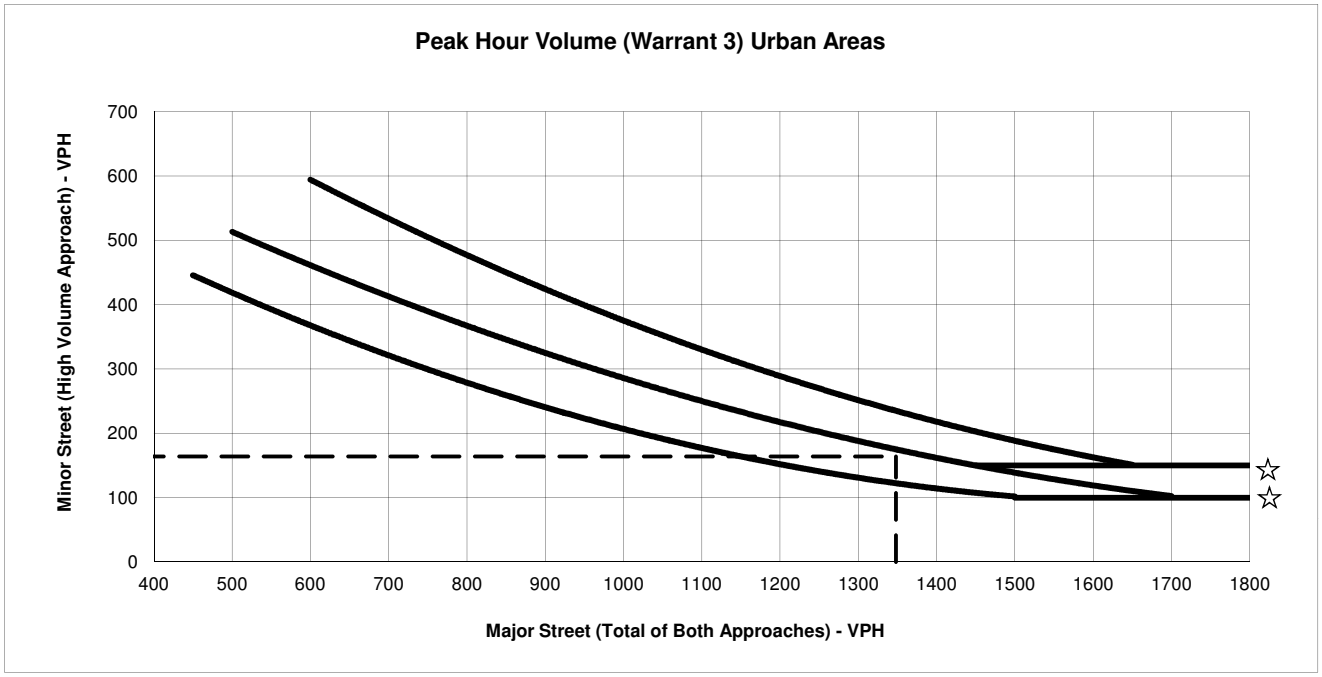

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:040 Plus Project PM Peak Hour

		Number of Lanes
Major Approach	Bechelli Lane	1
Minor Approach	Loma Vista Drive	1

Major St. Volume:	1348
Minor St. Volume:	164
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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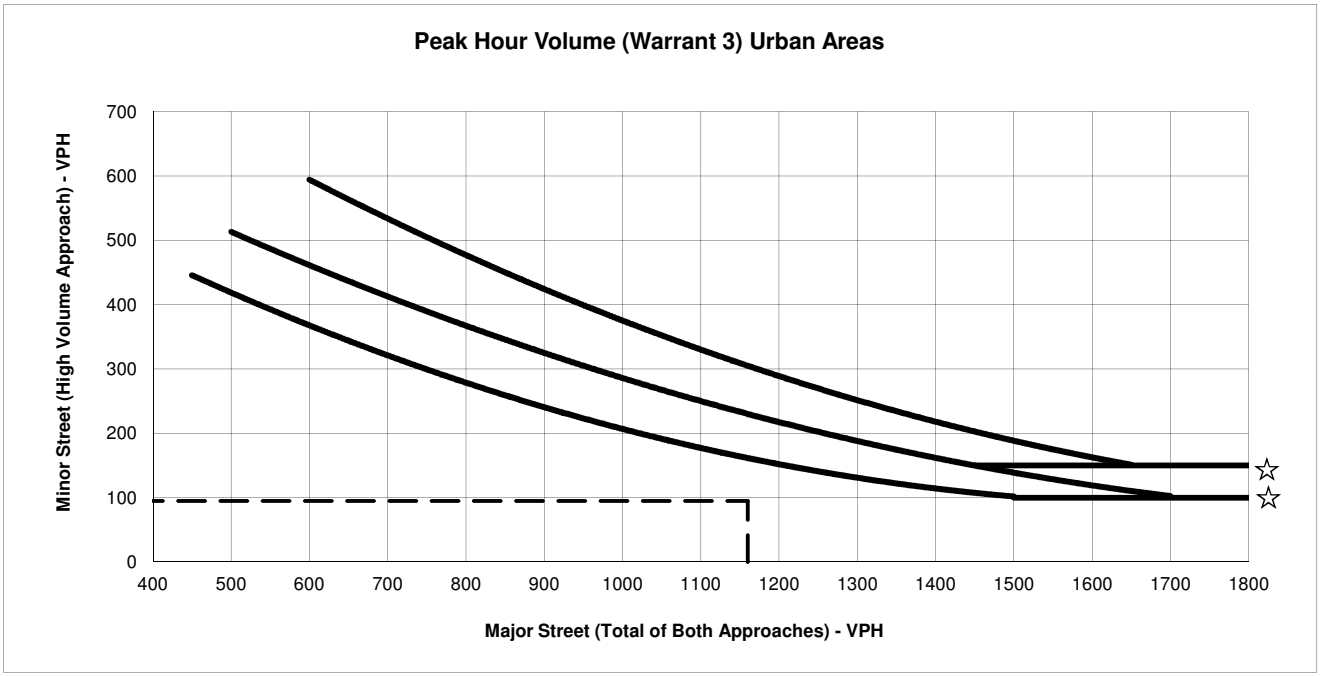

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Year 2040 Saturday Mid-day Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Huntington Drive	1

Major St. Volume:	1160
Minor St. Volume:	95
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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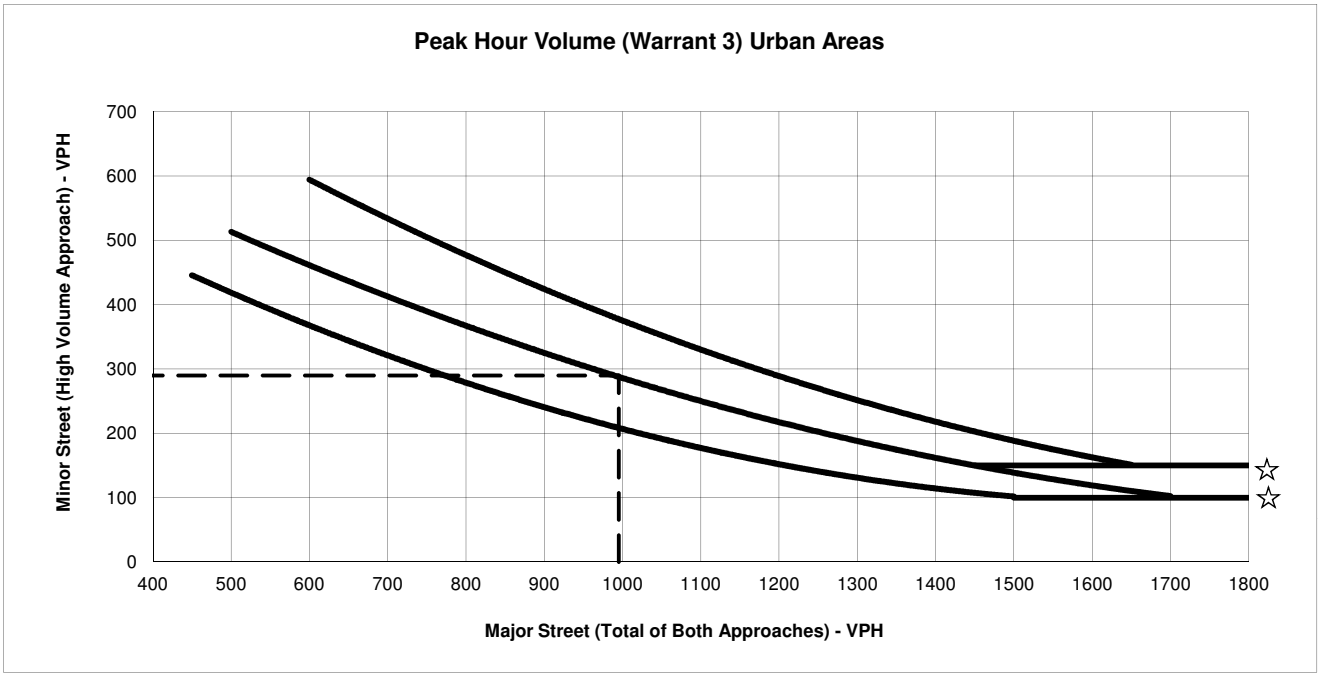

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Year 2040 Plus Project Saturday Peak Hour

		Number of Lanes
Major Approach	Churn Creek Road	1
Minor Approach	Victor Avenue	1

Major St. Volume:	995
Minor St. Volume:	290
Warrant Met?:	Yes

Appendix E: Memorandum by Kittelson & Associates on Redding Costco/Trip Information (September 13, 2016)

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

MEMORANDUM

Date: September 13, 2016 Project #: 20346.0

To: Russell A. Wenham, PE, Omni-Means

From: Chris Brehmer, Kittelson & Associates, Inc.

Cc: Michael Okuma, Costco Wholesale

Subject: Redding Costco/Trip Information

Costco Wholesale is proposing to develop a 150,000 square foot warehouse and Costco Gasoline on a property located north of W. Bonnyview Road in Redding. This memorandum provides an overview of trip generation rates and trip characteristics of Costco Warehouses with fuel stations based on surveys of similar Costco locations.

COSTCO WHOLESALE TRIP CHARACTERISTICS

Data obtained by Kittelson & Associates, Inc. (KAI) and collected from other consultants has shown that Costco Warehouses typically generate higher traffic volumes than other land uses with similar building sizes. An overview of weekday PM and Saturday midday peak hour trip generation characteristics is provided that has been collected between 2001 and 2010 at Costco Wholesale locations containing Costco Gasoline fuel stations throughout the western region of the United States. The rates shown for the sites include the fuel station as part of the calculated trip rate. In addition to the driveway trip rates, customer survey information has been included to provide the percentage of primary, pass-by, and diverted trips, as further described below.

- *Primary Trips* (an entirely new trip on the roadway system for the express purpose of driving to and from Costco),
- *Pass-by Trips* (existing trips that are on roadways adjacent to the site which allow the motorist to turn into the Costco development, and then continue on to their ultimate destination when their shopping is concluded), and
- *Diverted-Linked Trips* (existing trips on nearby roadways in which the motorist makes a decision to drive out-of-direction for a distance to stop at Costco, and when their shopping is concluded, continue on their trip to the ultimate destination).

TRIP CHARACTERISTICS APPLICATION

We recommend that the analysis models prepared for the Redding Costco site account for pass-by and diverted trip impacts at the study intersections, subject to applicable review agencies approvals. Typically, pass-by trips have an impact only at the site-access driveways, whereas the impact of diverted trips could extend throughout the study area intersections (these would be modeled similar to net new trips at many or all of the study area intersections in the operations models). The key

difference between inclusion and omission of the diverted trips is related to the overall vehicle miles traveled (VMT), as diverted trips do not create the same system impacts (air quality, noise, and freeway impacts) that entirely new trips to the system could create.

The previously surveyed Costco buildings are situated in a variety of locations, some adjacent to freeways/arterials, while others are located a couple of blocks away. This variation in warehouse locations results in differences in diverted and pass-by trips between locations. For example, sites adjacent to major arterial roadways tend to exhibit a high percentage of pass-by trips and a lower percentage of diverted trips. Similarly, Costco facilities located a block or two away from a freeway tend to experience a higher percentage of diverted trips. Given these factors, diverted and pass-by trips should be considered together with engineering judgment used to identify how these two trip characteristics should be applied.

Proper accounting of the diverted trips within the analysis models should include the impacts associated with these trips at the study area intersections. However, it should be noted that these trips do not create similar system capacity or environmental impacts as new trips to the system because these trips generally provide no impact beyond the study area.

TRIP GENERATION ESTIMATE

Trip generation studies were conducted at Costco Wholesale sites located across the western region of the United States using industry standard engineering practices consistent with guidance within the Institute of Transportation Engineers (ITE) standard reference, *Trip Generation Handbook, 9th Edition Volume 1.* These cordon surveys were conducted between 2001 and 2010, and include surveys of 22 Costco Warehouses with fuel centers in California, Oregon, Washington, Montana, Utah, and Colorado. The Costco Wholesale buildings surveyed range in size between 120,000 square-feet and 162,115 square-feet, with an average size of 143,782 square-feet. The Costco Gasoline fuel centers in the sample range between 12 and 16 fuel pumps. The trip generation rates are correlated to the overall warehouse size regardless of the number of fueling positions. Table 1 summarizes the average trip rates recorded.

Table 1. Average Trip Characteristics for a Costco Warehouse with Fuel Center

Land Use	Weekday Daily Trip Rate (per KSF)	Weekday PM Peak Hour of Adjacent Street Traffic Trip Rate (per KSF)			Saturday Midday Peak Hour (per KSF)		
		Total	In	Out	Total	In	Out
Costco Warehouse With Fuel Center	79.27	7.17	49%	51%	9.79	51%	49%
Primary Trips	*No Data*		*35%*			*50%*	
Pass-by Trips	*No Data*		*33%*			*29%*	
Diverted Trips	*No Data*		*32%*			*21%*	

Table 2 presents trip generation estimates for the proposed Redding Costco Warehouse with Costco Gasoline fuel center facility based on the data shown in Table 1. Note that adjustments for transportation demand management (TDM) reductions, etc. are not made in Table 2.

Table 2. Proposed Redding Costco Wholesale with Fuel Trip Generation Estimate

Land Use	Size	Weekday Daily Trips	Weekday PM Peak Hour of Adjacent Street Traffic		
			Total	In	Out
Costco Warehouse With Fuel Center	150,000 square feet	11,890	1,075	521	554
Pass-by Trips (33.3%)		*(3,959)*	*(358)*	*(174)*	*(184)*
Diverted Trips (31.5%)		*(3,745)*	*(339)*	*(164)*	*(175)*
Net New Trips		***4,186***	***378***	***183***	***195***

Note that the number of weekday daily primary, pass-by, and diverted trips were estimated using weekday PM peak hour trip type percentages.

Internal Trips

Trip generation data collected to date at Costco sites does not account for sites that are located within an integrated center. The Redding location co-located with other retail businesses is expected to result in some level of trip internalization. The limited internal trip information contained within ITE's *Trip Generation Handbook* identifies a twenty percent internal trip rate for retail to retail uses. However, the internal data is based on a limited sampling of sites in Florida, the interaction between specific tenants can vary significantly, and overall the best rate to apply seems to be one that is reasonable and justifiable. It is expected that the internal rates experienced at this site will reasonably range between five and fifteen percent.

COSTCO GASOLINE FUEL CENTER CHARACTERISTICS

The Costco Wholesale trip generation rates shown in Tables 1 and 2 inherently account for Costco Gasoline fuel station trips within the overall rate. However, supplemental information on the fuel centers from isolated studies is provided to describe the fuel center characteristics separately. This information was collected to highlight the trip characteristics of adding fuel centers to existing Costco Wholesale sites, but the isolated Costco Gasoline fuel center data can also be considered applicable to the Redding site during the weekday AM peak hour, when the Costco Wholesale is closed to the public and only serving limited employee or delivery trips.

Similar to the warehouse data, trip generation data for Costco fuel centers has been collected by manual or tube vehicle counts at existing Costco Gasoline facilities. Information related to internal trip capture and pass-by trip percentages was collected by interviewing Costco Gasoline customers about their trip patterns as they are purchasing fuel. Because Costco cards are also scanned as part of fuel center and Costco purchases, transaction data was also matched up to identify internalization rates between the store and fuel center.

COSTCO GASOLINE FUEL STATION TRIP CHARACTERISTICS

The data collected at existing Costco Gasoline fuel stations indicate the following general trip generation characteristics:

- Costco Gasoline fuel stations are an ancillary use for the warehouse and there is a large proportion of shared trips between the two.
- The fuel stations are member-only and require a membership card for pump activation.
- Credit/debit card is the only method of payment at the fuel stations and they do not provide any other services (automotive or convenience) besides gas.
- The fuel stations are staffed by a minimum of one attendant who is trained to help members operate the pumps and direct waiting vehicles to open pumps to manage on-site queuing and circulation.

The peak activity time on-site at Costco Gasoline facilities occurs during the weekend (Saturday) midday peak (between noon and 2 PM) as shown in Table 3.

Table 3. Costco Fuel Center Trip Characteristics

Trip Characteristics	Weekday Daily	Weekday AM Peak Hour	Weekday PM Peak Hour	Weekend Daily[1]	Weekend Peak Hour
Total Trip Rate	339.80 trips/fuel position	14.96 trips/fuel position	27.37 trips/fuel position	284.15 trips/fuel position	29.08 trips/fuel position
Internal Trip Percentage	No Data	0%[2]	33.9%	No Data	47%
Pass-by Trip Percentage[3]	No Data	32.5%	37.4%	No Data	25%

[1]Weekend daily trip rate estimated based on 8 weekends of transaction data at five Costco Gasoline sites with 16 fueling positions per site (California, Hawaii, Oregon, Utah, and Washington)

[2]Warehouse not open during weekday AM peak period

[3]Percentage of External Trips

Table 3 summarizes the trip generation characteristic observed by traffic counts and customer surveys at other Costco Gasoline facilities for total gas station trip generation rates, internal trip capture between the fuel station and the warehouse, and pass-by trip capture from the surrounding street system. The averages summarized in Table 3 include data collected at multiple California locations including Oxnard, Fountain Valley, Corona, City of Industry, Chino Hills, San Diego, Rancho Del Ray, Morena, Carlsbad, and Laguna Niguel.

As indicated in the table, the unique nature of Costco operations and its membership requirements result in different trip characteristics than those observed at the standard fuel stations summarized in ITE *Trip Generation*. The percentage of pass-by trips at Costco fuel stations is considerably lower than that reported in ITE *Trip Generation* for typical fuel stations. Correspondingly, membership requirements also have a significant effect on trip internalization (or sharing of trips) between the warehouse and the fuel station. Fewer people exclusively visit a Costco fuel station (in comparison to a typical stand alone station) because they have another primary purpose for visiting the site (that being a trip to the warehouse).

Internal Fuel Station Trips

A key finding from the studies conducted at Costco facilities is that a large portion of the weekday PM peak hour trips to and from Costco fueling stations are internal capture trips. Internal capture trips account for those customers who patronize both the warehouse and the gasoline pumps during a single visit to the Costco site. As such, although they account for a trip to both the warehouse and the fuel station, they only result in one overall vehicle trip to the site and on the surrounding transportation system. Table 3 shows that, based on studies including customer surveys at Costco fuel stations and membership card transaction data, on average 33.9 percent of the customers buying gas during the weekday PM peak hour are customers whose main purpose for visiting the site is to shop at the Costco warehouse. At some sites this number ranges as high as 75 percent, but for the purposes of analysis a conservative average estimate is typically applied.

Appendix F: Traffic Operations and Forecasts for the Bonnyview Interchange PSR (May 2017)

Appendix 4.12-8 Final Traffic Volume Forecasts

omni · means
ENGINEERING SOLUTIONS

Technical Memorandum No. 6

To:	City of Redding - Engineering	**Date:**	August 12, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Final Traffic Volume Forecasts	**Job No.:**	45-5721-27
		File No.:	C2174MEM006
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

The following summarizes the approach to preparing the final traffic volumes forecasts that will be used for the Traffic Operations Report.

History

Technical Memorandum No. 4 contained proposed traffic forecasts. The following issues were identified with the data contained in Technical Memorandum No. 4:

- The PM peak hour traffic distribution for the BoxCo TAZ, from the Regional Model, did not match the ITE rates.
- The AM and PM peak hour traffic distribution for the California Gold TAZ, from the Regional Model, was suspect.

A select link analysis was performed for the BoxCo and California Gold TAZ's with the results presented in **Technical Memorandum No. 5**. Upon review of the select link analysis, it was evident that there was an imbalance between inbound and outbound trips for both TAZ's.

Via. a July 7, 2016 email, Omni-Means recommended:

- No adjustments to the overall peak hour trips from each of the TAZ's.
- Manually adjusting the inbound and outbound peak hour volumes for both TAZ's to closely match ITE rates. The manual adjustments will be based upon the ITE codes in Table 1:

Table 1: BoxCo and California Gold TAZ – Model Trips Adjusted to ITE IN/OUT Splits

		AM Peak Hour			PM Peak Hour		
Landuse	Descriptor	In	Out	Total	In	Out	Total
BoxCo[1]	Model (used in forecasts)	NA	NA	NA	444	445	889
California Gold	Model (used in forecasts)	188	166	354	236	217	453
	ITE from Traffic Study (for comparison only)	169	155	324	253	240	493

Notes 1. Trip generation for Boxco based on actual trip rates from the existing site were used. Adjusted upwards to reflect a gas station and additional retail.

Via. emails on July 11, 2016, City and Caltrans staff concurred with the July 7, 2016 Omni-Means recommendations and directed Omni-Means to:

- Manually adjust the portion of BoxCo TAZ trips that are to/from Interstate 5 to 60% to/from the north and 40% to/from the south.

Manual Adjustments

While making the adjustments described under "History" above, we noted some anomalies likely due to the model redistribution with the buildout of the proposed uses. There were instances where the 2025 volumes were lower than the existing counts. To account for these anomalies, we checked the forecasted turning movements for reasonableness and made adjustments where necessary.

Final Traffic Volume Forecasts

The final forecasts were derived with the AM forecasts presented in Table 2 and the PM forecasts presented in Table 3, and in the attached figures.

Table 2: AM Peak Hour Final Traffic Volume Forecasts

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Year 2025 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	15	15	20	145	5	155	275	1000	15	30	985	320
2	**S Bonnyview Rd/I-F SB Ramps**				190		555		890	275	250	790	
3	**S Bonnyview Rd/I-5 NB Ramps**	410		265				470	615			640	520
4	**Churn Creek Rd/S Bonnyview Rd**	160	30	65	70	25	405	365	355	170	65	585	130
5	Churn Creek Rd/Alrose				15		105	45	440	5	5	685	20
Year 2035 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	20	20	25	160	10	165	290	1055	20	40	1080	360
2	**S Bonnyview Rd/I-F SB Ramps**	0	0	0	225	0	620	0	945	300	265	865	0
3	**S Bonnyview Rd/I-5 NB Ramps**	465	0	295	0	0	0	485	690	0	0	665	540
4	**Churn Creek Rd/S Bonnyview Rd**	160	30	65	100	25	420	425	400	170	65	625	160
5	Churn Creek Rd/Alrose	0	0	0	15	0	105	45	515	5	5	745	20
Year 2045 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	20	20	25	170	10	175	305	1110	20	45	1170	395
2	**S Bonnyview Rd/I-F SB Ramps**				255		685		995	320	275	935	
3	**S Bonnyview Rd/I-5 NB Ramps**	520		320				500	760			690	555
4	**Churn Creek Rd/S Bonnyview Rd**	160	30	65	130	25	430	480	440	170	65	665	190
5	Churn Creek Rd/Alrose				15		105	45	585	5	5	805	20

Table 3: PM Peak Hour Final Traffic Volume Forecasts

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Year 2025 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	25	15	25	635	20	310	185	1090	25	20	1015	390
2	**S Bonnyview Rd/I-F SB Ramps**				280		575		1230	520	300	855	
3	**S Bonnyview Rd/I-5 NB Ramps**	325	5	250				630	880			825	285
4	**Churn Creek Rd/S Bonnyview Rd**	125	10	25	145	15	475	410	640	80	35	505	130
5	Churn Creek Rd/Alrose	10	5	5	25		95	105	700	5	5	565	30
Year 2035 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	25	20	35	715	20	340	200	1165	30	25	1070	440
2	**S Bonnyview Rd/I-F SB Ramps**	0	0	0	300	0	600	0	1335	580	330	935	0
3	**S Bonnyview Rd/I-5 NB Ramps**	360	5	275	0	0	0	680	950	0	0	900	345
4	**Churn Creek Rd/S Bonnyview Rd**	125	10	25	175	15	535	445	700	80	35	580	155
5	Churn Creek Rd/Alrose	10	5	5	25	0	95	105	785	5	5	665	30
Year 2045 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	25	20	40	795	20	365	215	1240	30	30	1120	485
2	**S Bonnyview Rd/I-F SB Ramps**				315		625		1435	640	355	1010	
3	**S Bonnyview Rd/I-5 NB Ramps**	395	5	295				730	1020			970	400
4	**Churn Creek Rd/S Bonnyview Rd**	125	10	25	200	15	595	480	755	80	35	650	180
5	Churn Creek Rd/Alrose	10	5	5	25		95	105	870	5	5	760	30

California Gold TAZ Peak Hour Adjustments

In order to document the adjustments that went into the final traffic volume forecasts, Table 4 presents the adjustments for the AM peak hour and Table 5 presents the adjustments for the PM peak hour, that are described under "History" above. The adjustments shown in Tables 4 and 5 represent the “net” adjustments between the regional model’s imbalanced trip generation/distribution and the manual trip generation/distribution. As such, there are instances where the adjustment shown in Tables 3 and 4 is negative.

For ease of calculations, the presented adjustments were applied to Year's 2025, 2035 and 2045 forecasts.

Table 4: California Gold AM Peak Hour Adjustments

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2025, 2035 & 2045 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	0	0	0	-5	0	0	0	5	0	0	14	-4
2	**S Bonnyview Rd/I-F SB Ramps**	0	0	0	-48	0	0	0	0	0	13	11	0
3	**S Bonnyview Rd/I-5 NB Ramps**	0	0	-27	0	0	0	0	-47	0	0	24	26
4	**Churn Creek Rd/S Bonnyview Rd**	0	-1	0	5	-1	50	-74	0	0	0	0	-7
5	**Churn Creek Rd/Alrose**	0	0	0	0	0	0	0	5	0	0	-7	0

Table 5: California Gold PM Peak Hour Adjustments

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2025, 2035 & 2045 Forecasts													
1	S Bonnyview Rd/Bechelli Lane	0	0	-1	-6	0	0	0	15	0	0	-3	-3
2	S Bonnyview Rd/I-F SB Ramps	0	0	0	39	0	0	0	9	0	-40	-5	0
3	S Bonnyview Rd/I-5 NB Ramps	0	0	2	0	0	0	0	47	0	0	-45	-36
4	Churn Creek Rd/S Bonnyview Rd	0	-2	0	1	-2	-82	49	0	0	0	0	10
5	Churn Creek Rd/Alrose	0	0	0	0	0	0	0	1	0	0	10	0

BoxCO TAZ PM Peak Hour Adjustments

In order to document the adjustments that went into the final traffic volume forecasts, Table 6 presents the Year 2025 adjustments for the PM peak hour, that are described under "History" above:

Table 6: Year 2025 BoxCo PM Peak Hour Adjustments

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2025 Forecasts													
1	S Bonnyview Rd/Bechelli Lane	0	-1	0	-72	-2	-22	24	0	0	0	0	90
2	S Bonnyview Rd/I-F SB Ramps	0	0	0	0	0	67	0	-29	-43	0	23	0
3	S Bonnyview Rd/I-5 NB Ramps	12	0	0	0	0	0	-14	-14	0	0	10	0
4	Churn Creek Rd/S Bonnyview Rd	-3	0	0	0	0	7	-2	-10	-2	0	7	0
5	Churn Creek Rd/Alrose	0	0	0	0	0	0	0	-10	0	0	7	0

Table 7 presents the Year 2035 and Year 2045 adjustments for the PM peak hour, that are described under "History" above:

Table 7: Year 2035 and 2045 BoxCo PM Peak Hour Adjustments

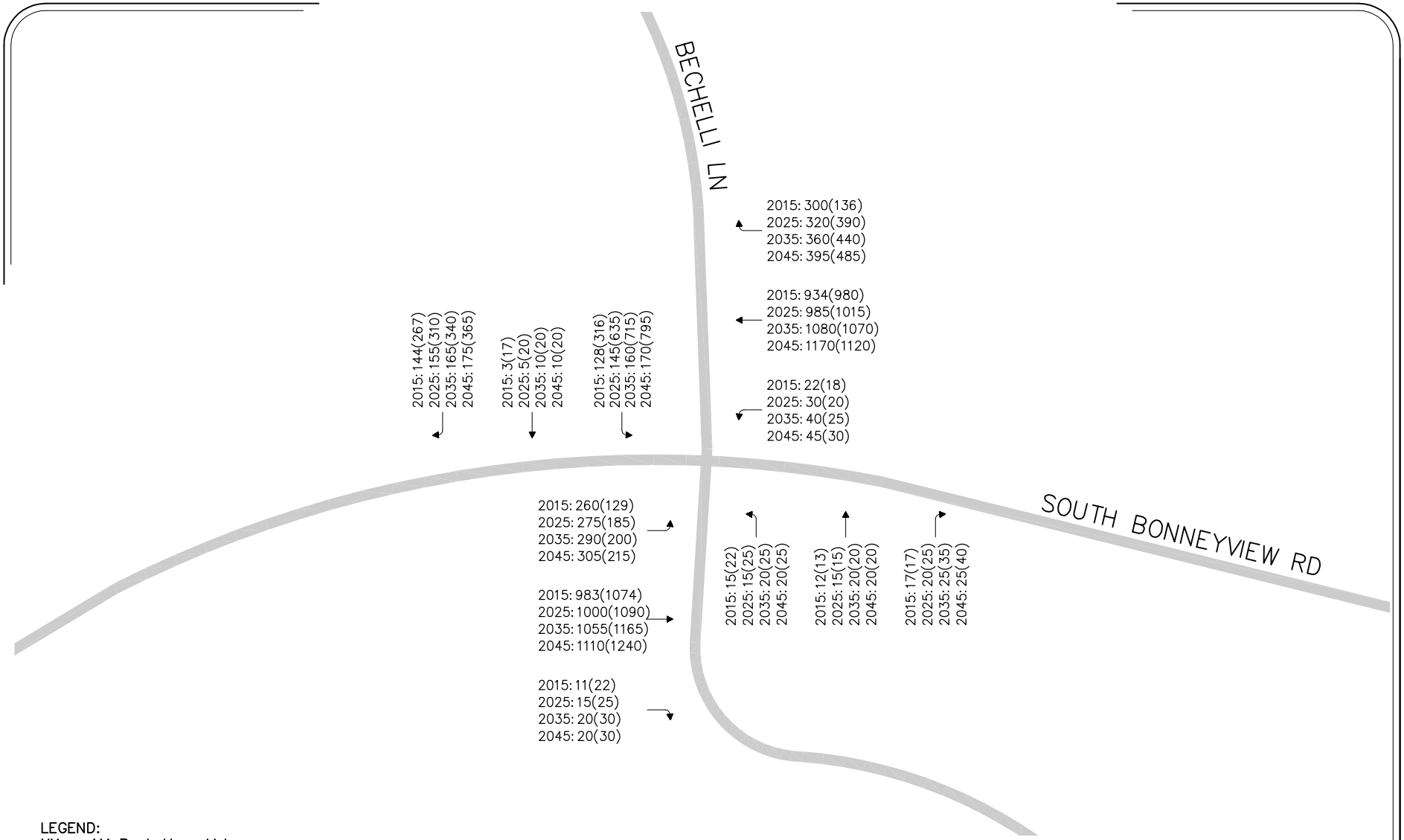
Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2035 & 2045 Forecasts													
1	S Bonnyview Rd/Bechelli Lane	0	-1	0	-76	-2	-23	25	0	0	0	0	95
2	S Bonnyview Rd/I-F SB Ramps	0	0	0	0	0	70	0	-30	-45	0	24	0
3	S Bonnyview Rd/I-5 NB Ramps	13	0	0	0	0	0	-15	-15	0	0	11	0
4	Churn Creek Rd/S Bonnyview Rd	-3	0	0	0	0	7	-2	-11	-2	0	7	0
5	Churn Creek Rd/Alrose	0	0	0	0	0	0	0	-11	0	0	7	0

Next Steps

1. Final agency approval of the data presented in this Technical Memorandum.
2. Agency concurrence regarding Traffic Operations technical analysis parameters. The information will be presented in Technical memorandum No. 7.

Traffic Forecast Figures

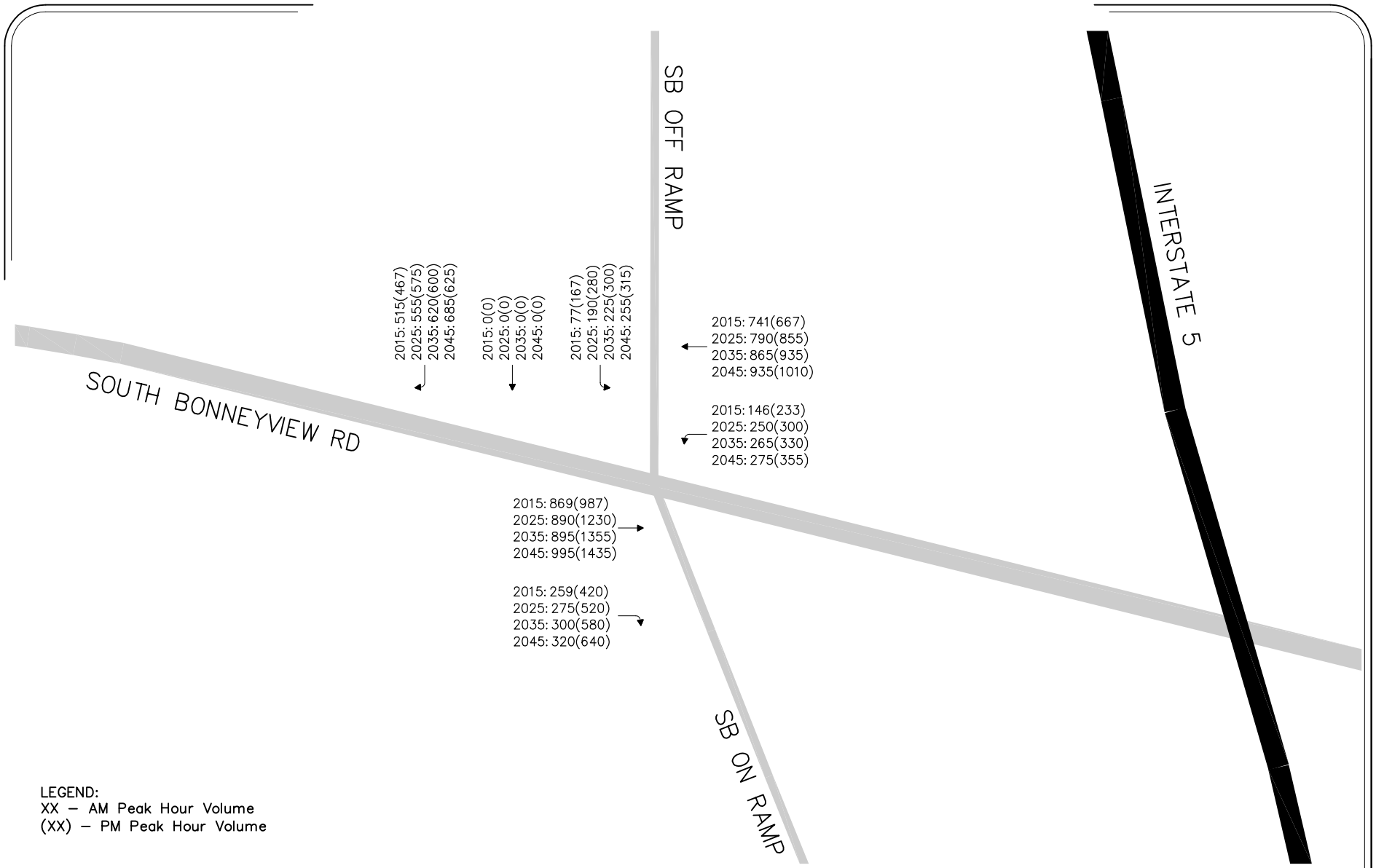
Attached are final traffic forecast figures.



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS



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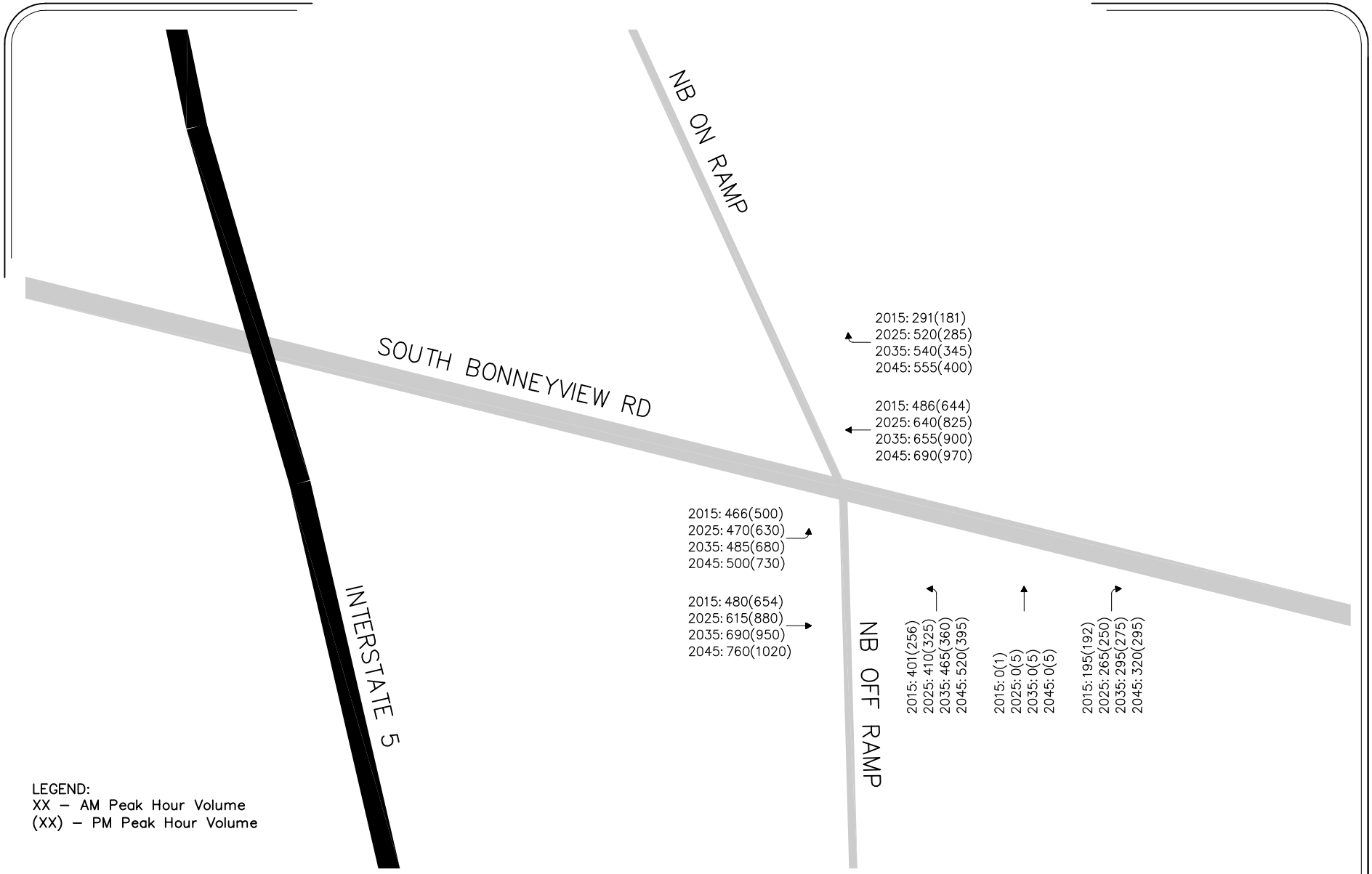
FINAL TRAFFIC FORECASTS



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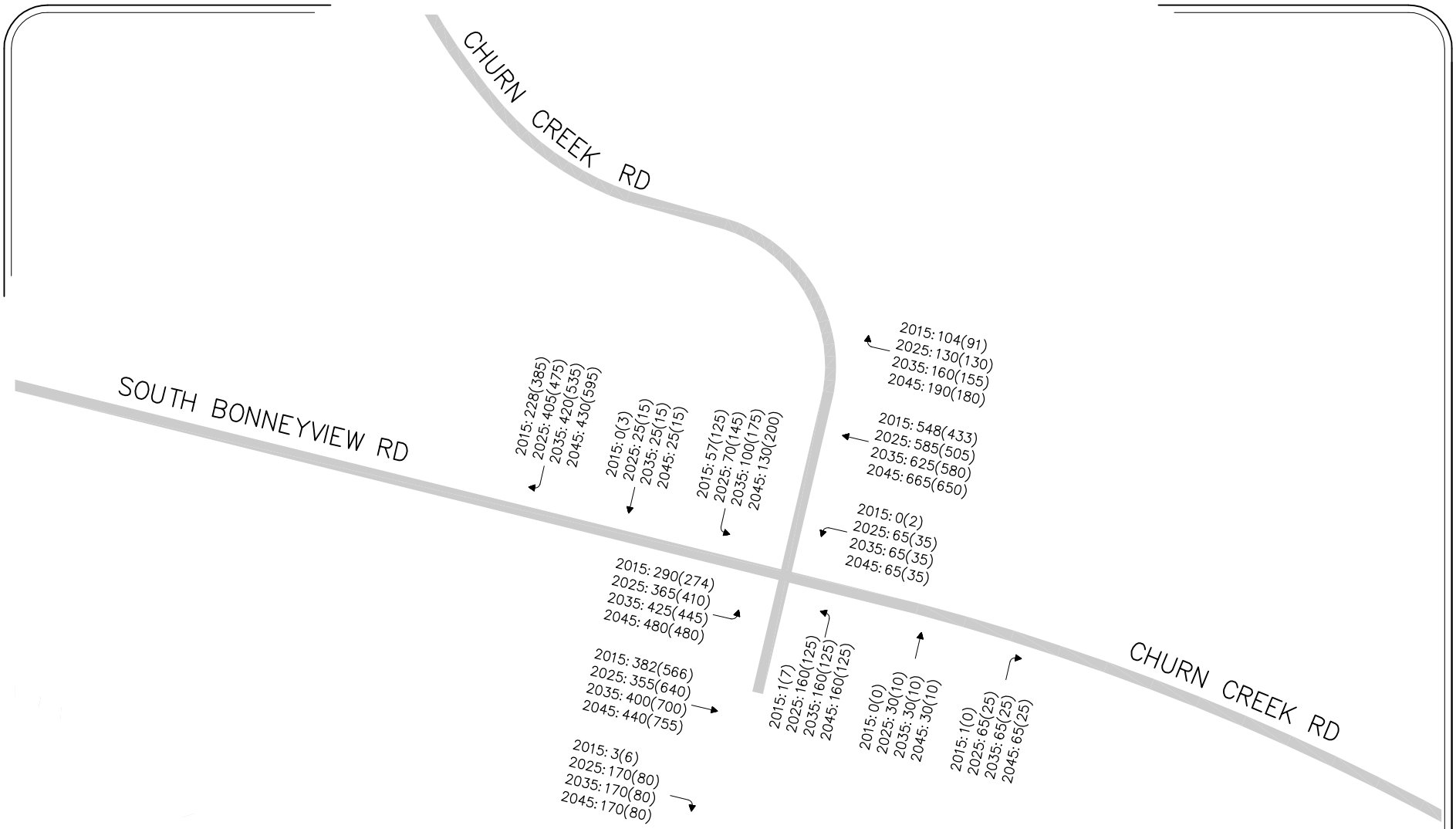
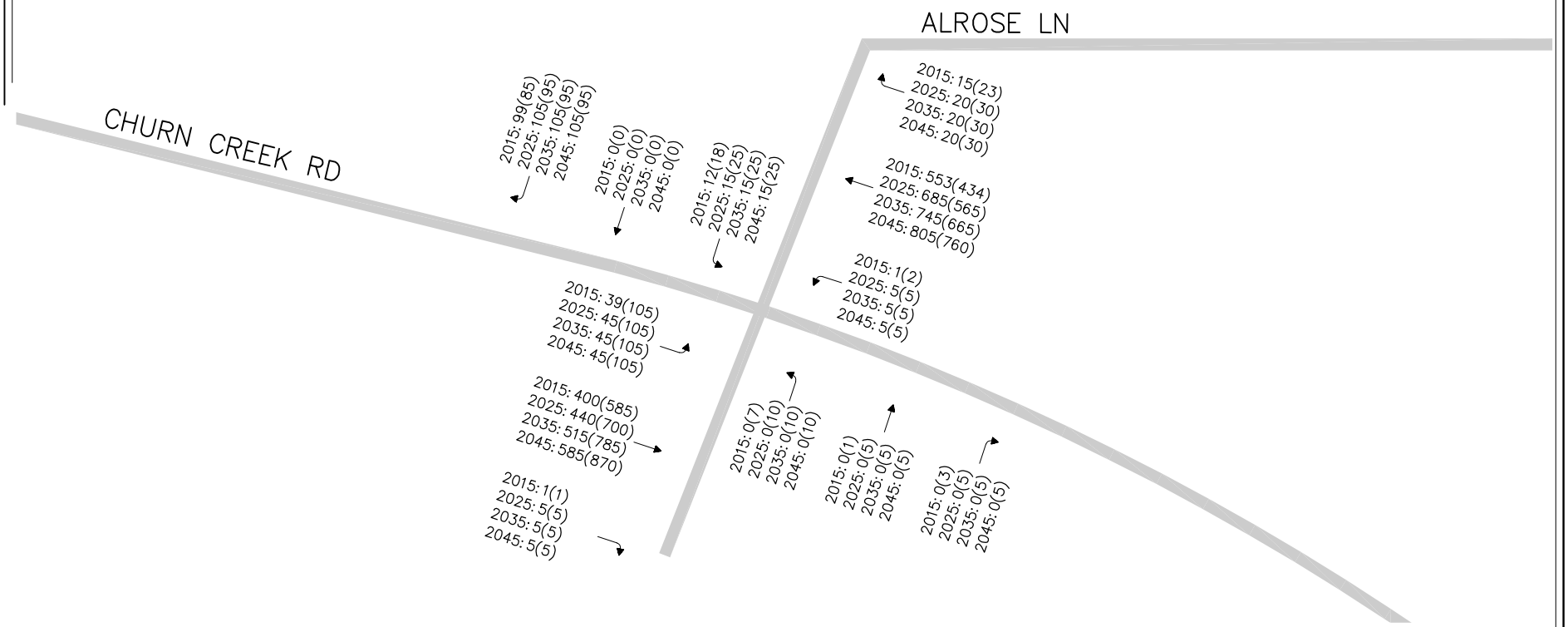
FINAL TRAFFIC FORECASTS



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS

Appendices

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Interstate 5 / S. Bonnyview Road Interchange Traffic Operations Report - Project Study Report

Prepared for:

City of Redding

Prepared by:

omni · means
A GHD company

Interstate 5 / S. Bonnyview Road Interchange
Traffic Operations Report for Project Study Report

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May 2017

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APPENDIX

Appendix A: Technical Memorandums 2

Technical Memorandum No. 1 - Proposed Approach to Traffic Volume Projections

Technical Memorandum No. 2 - Proposed Approach to Traffic Volume Projections

Technical Memorandum No. 3 - Proposed Approach to Traffic Volume Projections

Technical Memorandum No. 4 - Traffic Forecast - Proposed Volumes

Technical Memorandum No. 5 - Model Select Link Analysis for "BoxCo" and " California Gold" Developments

Technical Memorandum No. 6 - Final Traffic Volume Forecasts

Technical Memorandum No. 7 - Traffic Operations Analysis - Approach to Work

Technical Memorandum No. 8 - T. Operations for Alternatives 1 and Alternatives 3 Year 2045

Technical Memorandum No. 9 - Year 2045 T. Operations for Alternative 2

Technical Memorandum No. 10 - Year 2045 T. Operations for Alternative 4

Technical Memorandum No. 11 Year 2035 T. Operations for Alternative 1, Alternative 2, Alternative 3, and Alternative 4

Technical Memorandum No. 12 - Travel Time Run Summaries for the various Alternatives

Technical Memorandum No. 13 - T. Operations for No Build Alternative in 2025, 2035, and 2045

Technical Memorandum No. 14 - T. Operations for Alternative 1 (Revised), Alternative 2 (Revised), and Alternative 4 (Revised

Technical Memorandum No. 15 - T. Operations for Alternative 1, Alternative 2, and Alternative 4 with Rancheria Development

Introduction

This report presents the Traffic Operations Report (TOR) for the Project Study Report (PSR) for the reconstruction of the Interstate 5 / South Bonnyview Road Interchange (Project). The TOR is a technical supporting document for the PSR being prepared by Caltrans. The analysis of the Project is a cooperative effort between Caltrans and the City of Redding (City) that is prompted by past and anticipated urban land development in the Project vicinity that is anticipated to increase traffic volumes and result in unacceptable traffic operations.

Work on the TOR began in May 2016 under the guidance of a focused Project Development Team (PDT) made up of Caltrans, City and Omni-Means personnel. The PDT met sixteen times over a twelve month period. The PDT meetings were conducted in a workshop format to establish direction and confirm assumptions, methodologies, analysis and conclusions. Technical analysis in support of the TOR was prepared in the form of fifteen Technical Memorandums which underlay the TOR and are included in the Appendix.

Study Area

The Project study area encompasses the Interstate 5 / South Bonnyview Road Interchange and the adjacent City-jurisdiction intersections. More specifically, the TOR focuses on the traffic operations for the following facilities:

- South Bonnyview Road / Bechelli Lane Intersection.
- South Bonnyview Road / Interstate 5 Southbound (SB) Ramps Intersection.
- South Bonnyview Road / Interstate 5 Northbound (NB) Ramps Intersection.
- South Bonnyview Road / Churn Creek Road Intersection.
- Churn Creek Road / Alrose Lane Intersection.

Project Area Transportation System

Roadways that provide primary circulation in the vicinity of the Project are as follows:

Interstate 5 (I-5) is an interstate freeway facility that traverses in the south-north direction through the State of California. In northern California, I-5 serves as the primary inter-regional auto and truck travel route that connects the northern counties with the Sacramento Valley. Within Shasta County, I-5 serves as a major commuter and truck route linking the Cities of Anderson, Redding, and Shasta Lake. There is a full-access tight-diamond interchange with South Bonnyview Road at Exit 675.

Churn Creek Road is a two to four-lane, north-south arterial that traverses between Airport Road and College View Drive. Churn Creek Road connects rural areas south of the City to the following arterial streets to the east of the Project – Rancho Road and Victor Avenue. North of the Project, Churn Creek Road serves residential and commercial areas as well as area schools.

South Bonnyview Road is a four-lane, east-west arterial that traverses between State Route 273 and Churn Creek Road. South Bonnyview Road provides a link across the Sacramento River between the south-west Redding area and I-5. South Bonnyview Road crosses I-5 via Churn Creek Road Overcrossing (Bridge Number 06-0122). The following Project-related South Bonnyview Road intersections are signalized:

- Bechelli Lane
- I-5 SB Ramps
- I-5 NB Ramps
- Churn Creek Road

Bechelli Lane is a two to four-lane, north-south arterial that runs between south of South Bonnyview Road to its northern terminus, approximately one mile to the north of East Cypress Avenue. Bechelli lane provides access to residential and commercial areas.

Alrose Lane is a two-lane local City street that serves commercial and residential areas north of Churn Creek Road. South of Churn Creek Road, and serving as the fourth leg of an unsignalized intersection with Churn Creek Road, there is a driveway to a small health club and office building.

Design Year

The PDT selected year 2045 as the 20-year design year in accordance with Caltrans Highway Design Manual Section 103.2.

Existing Traffic Counts

Omni-Means collected weekday AM and weekday PM peak hour intersection turn movement counts at the study intersections on Thursday, November 12, 2015. The existing traffic volumes were used as a base-line for future year projections.

Technical Memorandum Number (TM#) 3 in the Appendix summarizes year 2015 existing traffic volumes. See **Figures 1 though 5** for year 2015 existing traffic volumes.

Traffic Forecasts

After commencement of the analysis presented in the TOR, the Bureau of Indian Affairs (BIA) published a Notice of Intent (NOI) on November 29, 2016 to prepare an Environmental Impact Statement (EIS) for the proposed Redding Rancheria Fee-to-Trust and Casino Project (Rancheria Development), south-west of the Project. Since the majority of the analysis was complete when the NOI was published, the forecasts, and subsequent traffic operations analysis were split into two primary approaches:

- Base forecasts and analysis were performed without consideration of the Rancheria Development.
- Additional forecasts and analysis were performed with the addition of the Rancheria Development. To further understand the incremental impact of the Rancheria Development, the traffic operations analysis was performed with both half and full Rancheria Development.

Base Forecasts (Without Rancheria Development)

Future year traffic volumes were forecast by using the Shasta Regional Transportation Agency (SRTA) Activity-Based Travel Demand Model (ShastaSIM), with adjustments for potential land development that is not included in ShastaSIM as published.

The adjustments, and the final forecasted traffic volumes are summarized in TM# 1 to TM# 6, contained in the Appendix. Following is a summary of the land development adjustments to ShastaSIM, that are assumed to be in place in year 2045.

- A Costco-anchored development will be constructed north of South Bonnyview Road, west of I-5 and east of Bechelli Lane.
- The Churn Creek Marketplace shopping center (approximately 150,000 square feet (sqft)).
- A gas station with mini-mart with a coffee shop and a sandwich shop, south of South Bonnyview Road and east of I-5.
- Phase II of the Blue Shield development.
- Additional residential dwelling units along South Bonnyview Road, between Route 273 and the Sacramento River.
- Additional residential dwelling units, south of the Rivercrest Estates subdivision.
- Occupancy of the partially constructed multi-story office building, south of South Bonnyview Road and adjacent to the east bank of the Sacramento River.
- Neighborhood shopping center at the intersection of Rancho Road and Shasta View Drive.
- Buildout of the Shastina Ranch, Stonesfair and Schellenger subdivisions. Each of these approved or anticipated residential subdivisions are located south of Rancho Road and west of Airport Road.
- The addition of over 300 jobs in the Stillwater Business Park.

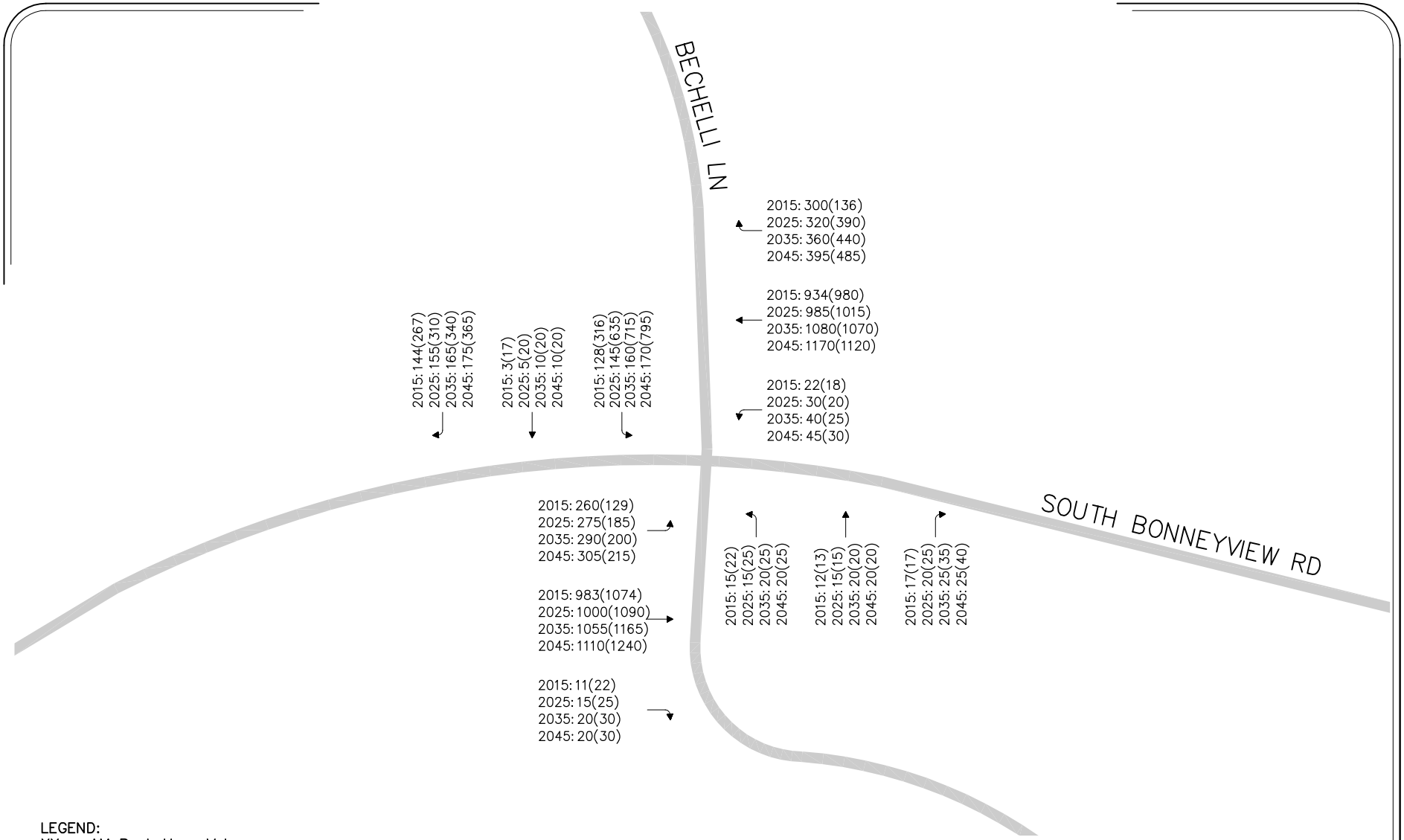
In addition to the forecasts for year 2045, forecasts were developed for year 2025 and year 2035 to represent the Project occupancy year and a 10-year interim year of construction.

The year 2025, 2035 and 2045 forecasted traffic volumes used for analysis are presented in **Figures 1 through 5**.

Forecasts (With Rancheria Development)

Kimley-Horn (K-H), subconsultant to the EIS prime consultant, analytical Environmental Services (AES), prepared a *Trip Generation and Distribution Methodology* Memorandum on September 7, 2016 for the Rancheria Development. The weekday PM peak hour trip generation and distribution information in the K-H Memorandum was accepted by the PDT for use in this TOR.

The K-H Memorandum did not address weekday AM peak hour trip generation. The weekday AM peak hour trip generation for the Rancheria Development was derived and is presented in **Table 1.**



LEGEND:
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I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 1

FINAL TRAFFIC FORECASTS

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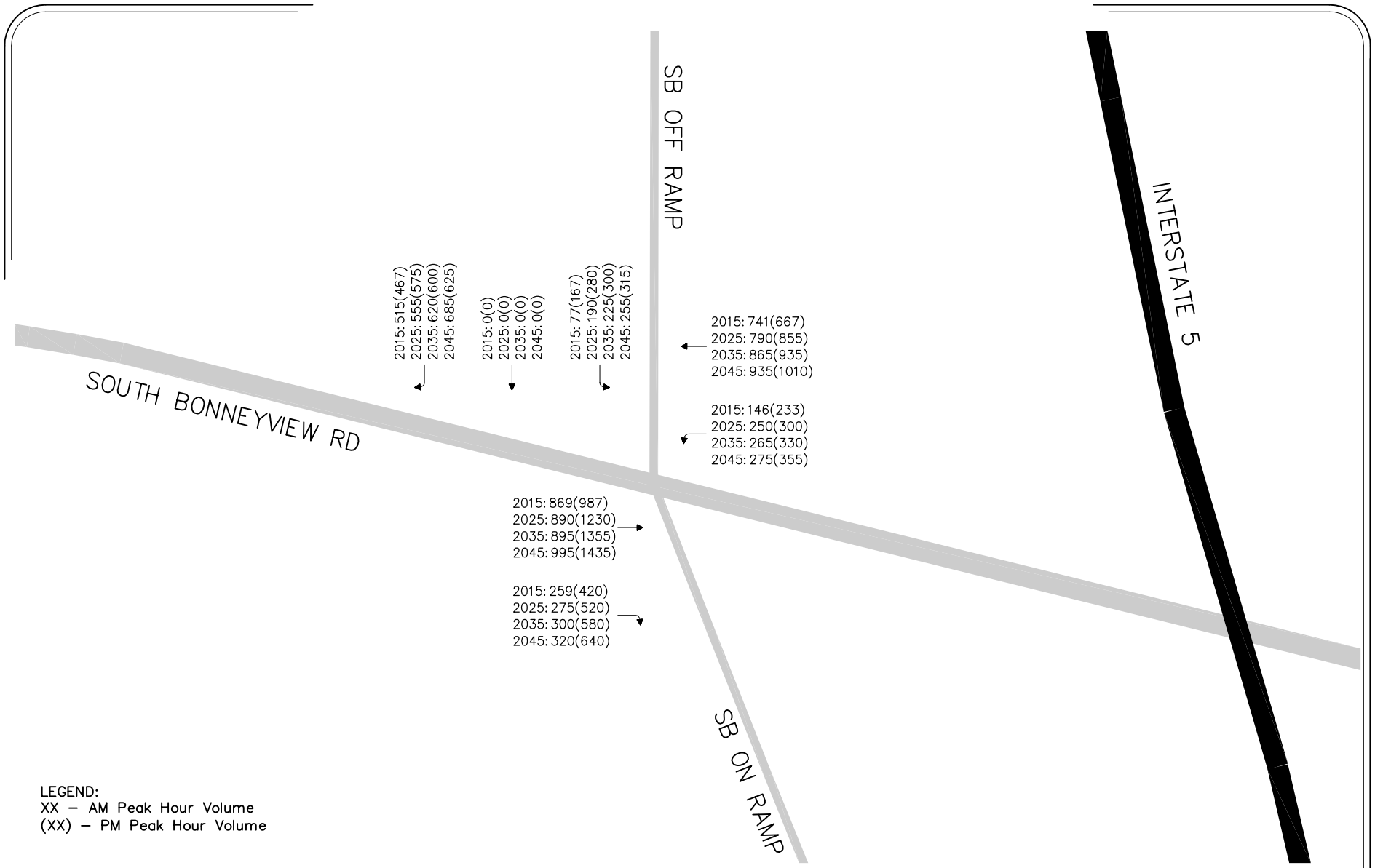

Figure 2

I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS

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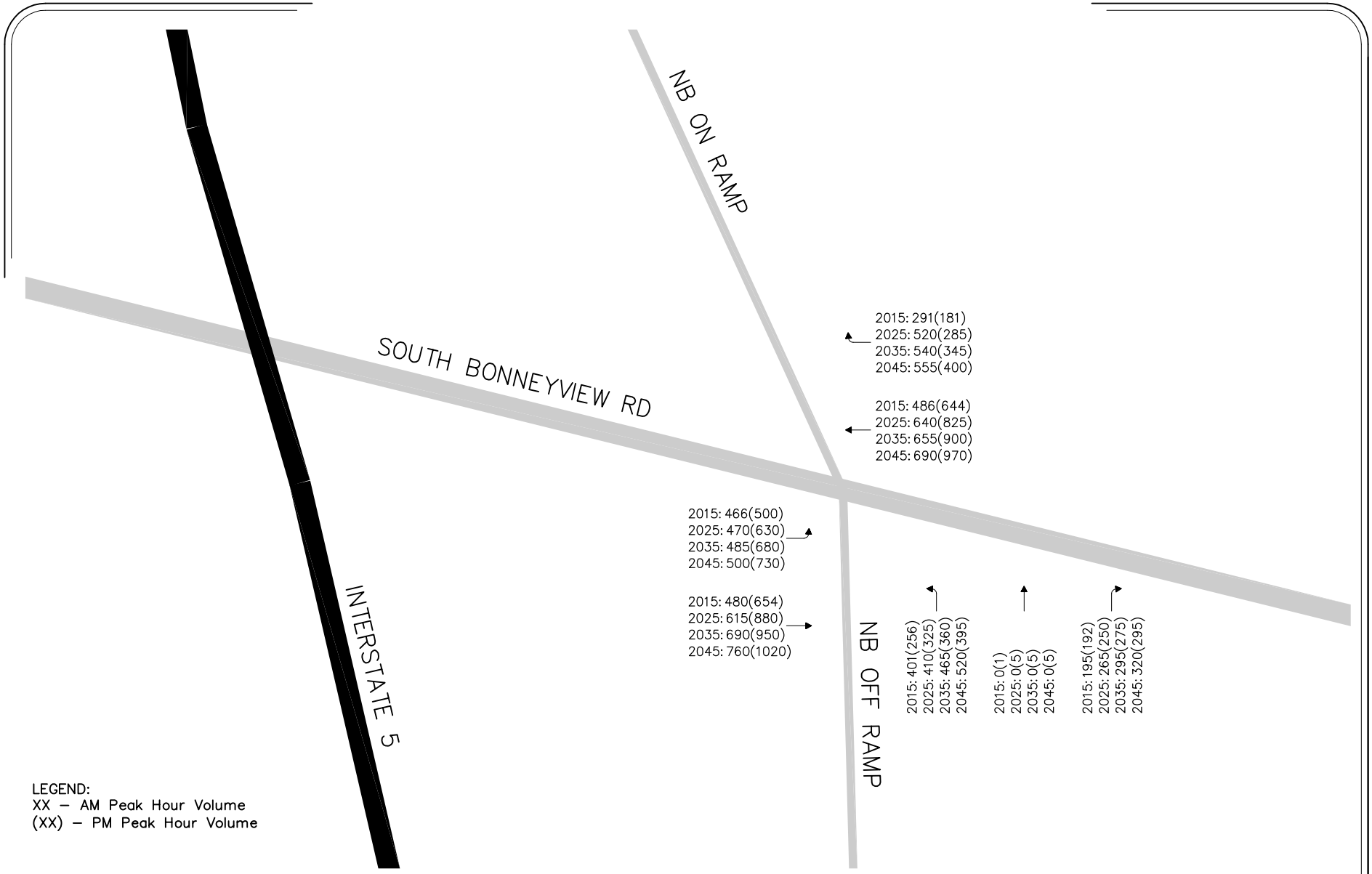
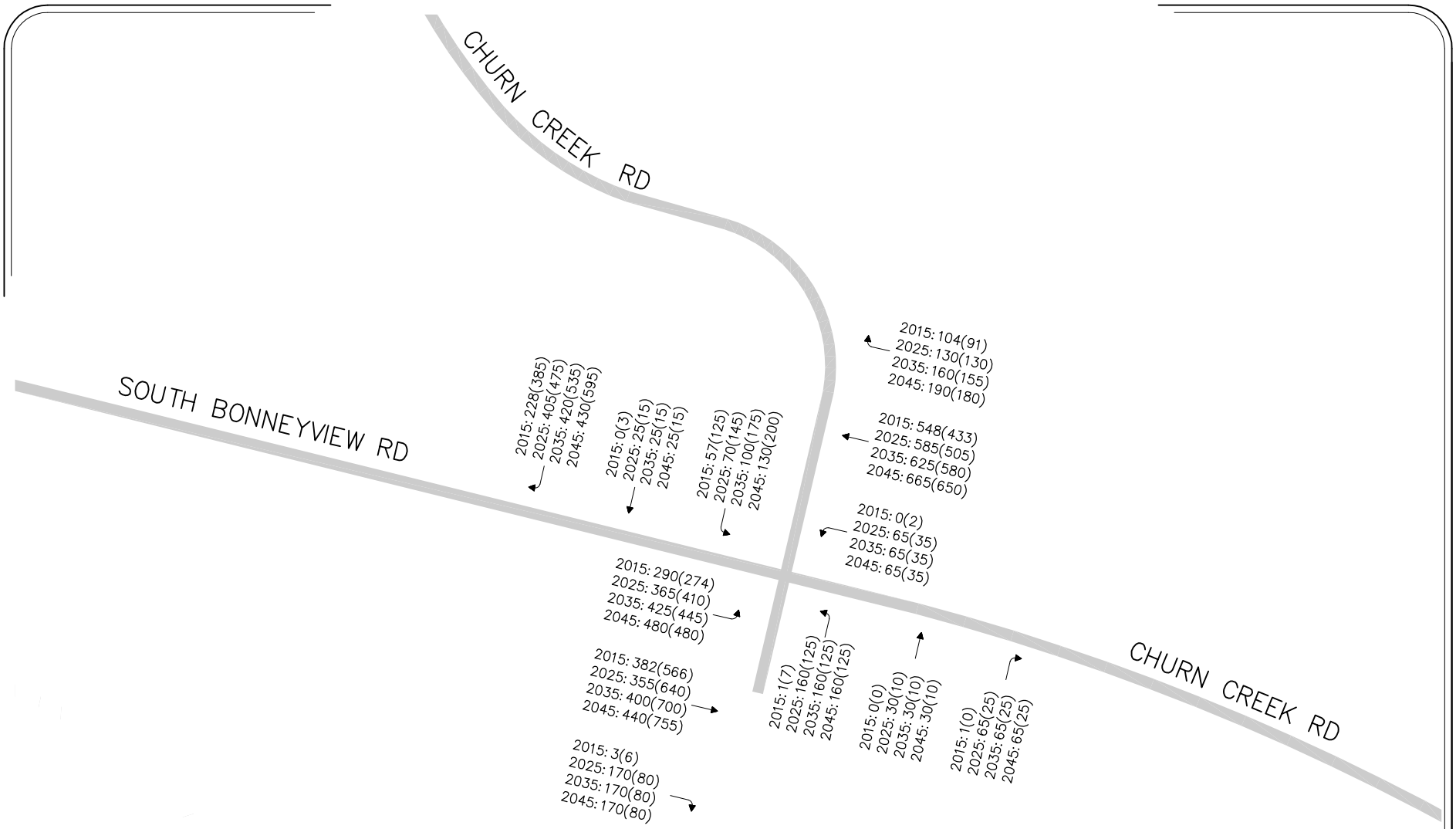


I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 3

FINAL TRAFFIC FORECASTS



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I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 4

FINAL TRAFFIC FORECASTS

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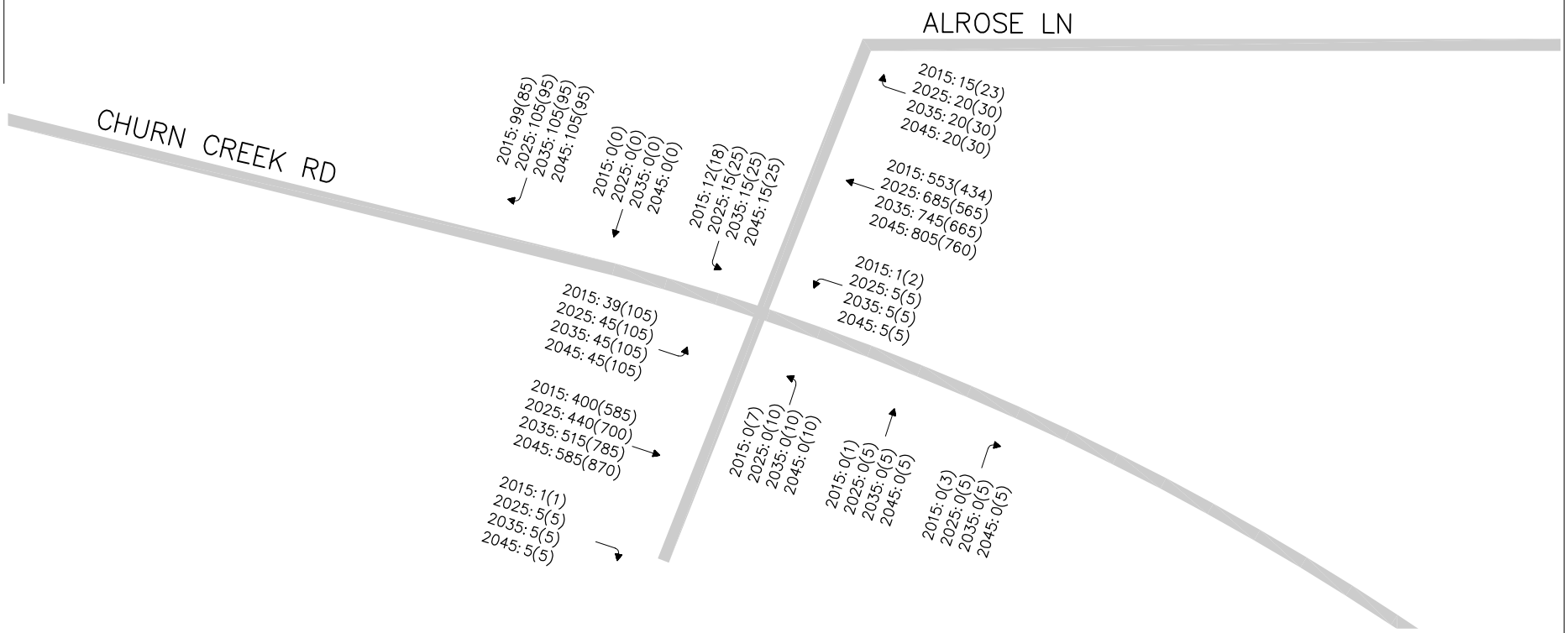

LEGEND:
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(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 5

FINAL TRAFFIC FORECASTS

TABLE 1
WEEKDAY AM PEAK HOUR RANCHERIA DEVELOPMENT TRIP GENERATION

Land Use	ITE Code	Quantity	Units	Weekday AM Peak Hour		
				In	Out	Total
Casino	N/A	140,000	SF	206	88	294
Conference Center	N/A	10,080	SF	178	45	223
Event Center	N/A	1,800	Seats	12	2	14
Hotel	310	250	Rooms	18	15	33
Sporting Goods Superstore	861	130,000	SF	111	83	194
Subtotal Vehicle Trips				525	233	758
Diverted Link Trips (10%) - Applied only to Casino and Sporting Goods Store				(32)	(17)	(49)
Net New Vehicle Trips				493	216	709

In order to provide a sensitivity analysis, the Rancheria Development analysis was performed with traffic volumes representing one half of the Rancheria Development and the full Rancheria Development. For comparison, the casino portion of the Rancheria Development is expected to generate approximately 57 percent of the total weekday PM peak hour traffic as compared to the full Rancheria Development.

The "With Rancheria Development" analysis was only performed for the year 2045 conditions.

The year 2045 forecasted traffic volumes used for analysis, for "Half Rancheria Development" and "Full Rancheria Development" are presented in TM# 15 in the Appendix and are summarized in **Figures 6 through 10**.

Project Alternatives

The PDT directed the development and analysis of four primary alternatives in addition to a No-Build alternative.

Base Alternatives

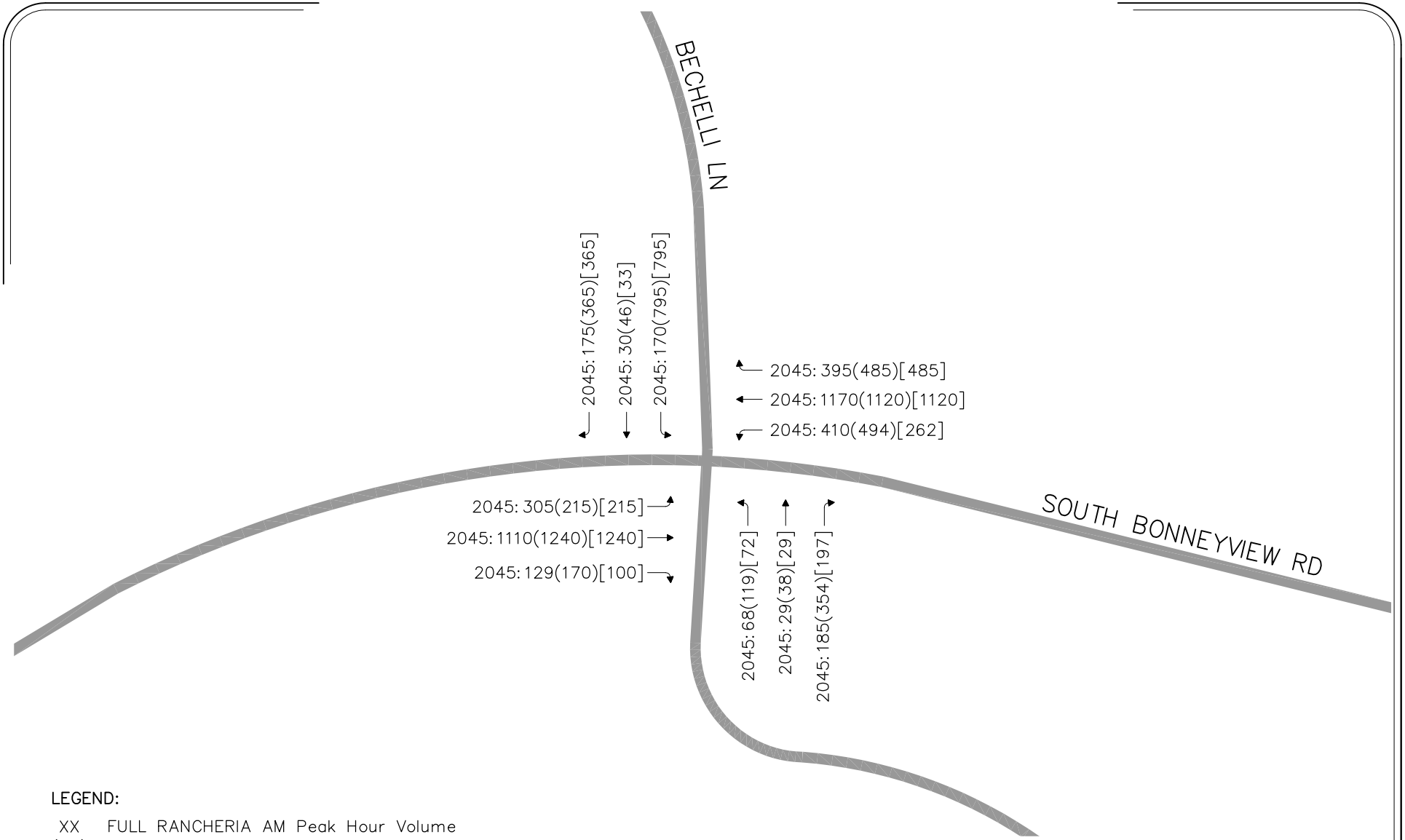
The following alternatives were identified by the PDT for analysis in this TOR:

Alternative 1 – Traditional Tight Diamond Interchange

Alternative 1 perpetuates the Caltrans Type L-1 Tight Diamond interchange and uses traditional signal controls at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. Roadways and ramps are widened and ramps are lengthened to accommodate forecasted traffic. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 11** for Alternative 1 geometry.

Alternative 2 – Diverging Diamond Interchange (DDI) With Traditional Signals at City Intersections

Alternative 2 proposes a DDI that is a type of diamond interchange in which the two directions of traffic on the non-freeway road cross to the opposite side on both sides of the overcrossing at the freeway. It is unusual in that it requires traffic on the freeway overcrossing to briefly drive on the opposite side of the road from what is customary for the jurisdiction. Roadways and ramps are widened and ramps are lengthened to accommodate forecasted traffic. Traditional signal controls are used at the South Bonnyview Road intersections with Bechelli Lane and Churn



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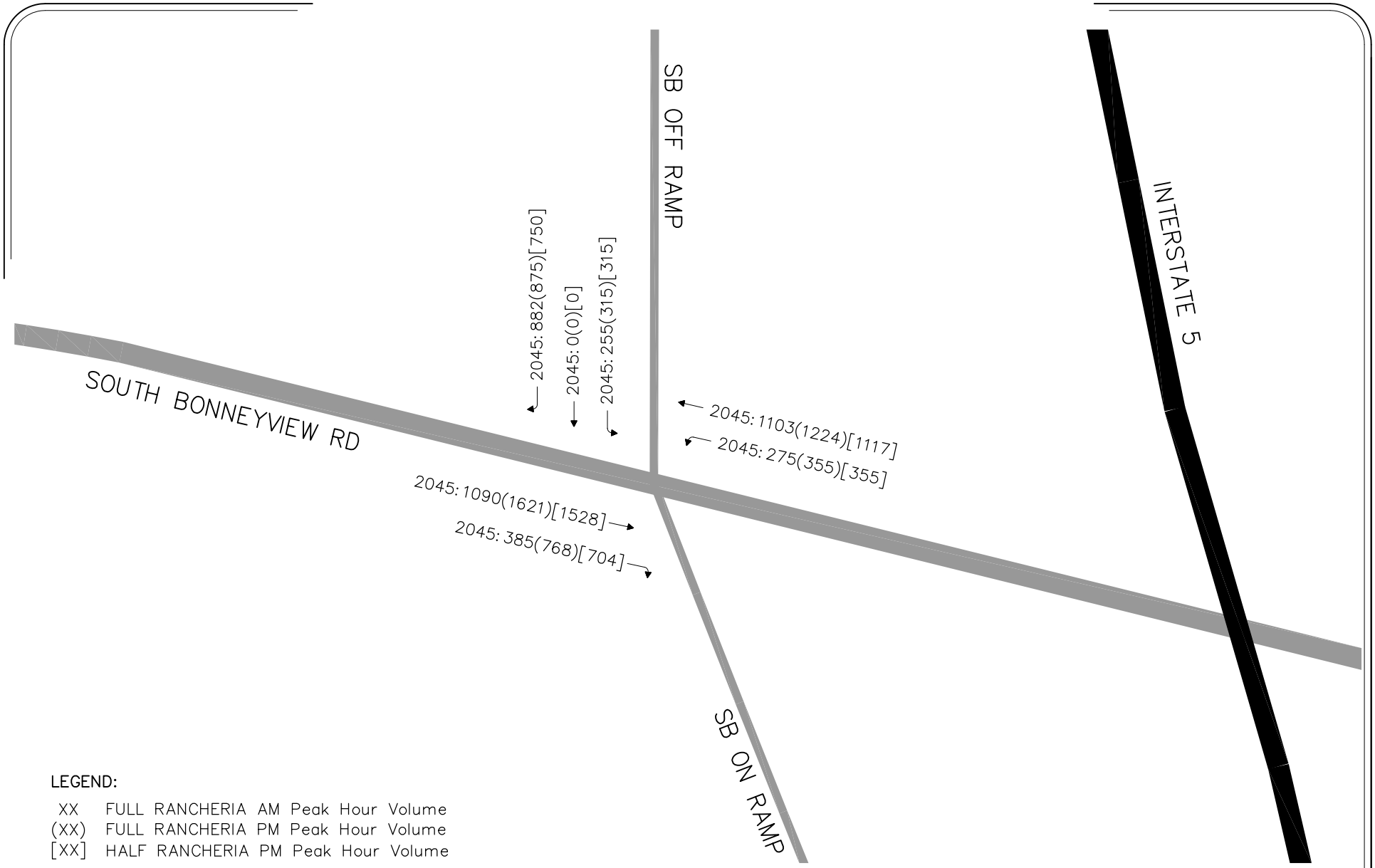
(XX) FULL RANCHERIA PM Peak Hour Volume
[XX] HALF RANCHERIA PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 6

FINAL RANCHERIA TRAFFIC FORECASTS



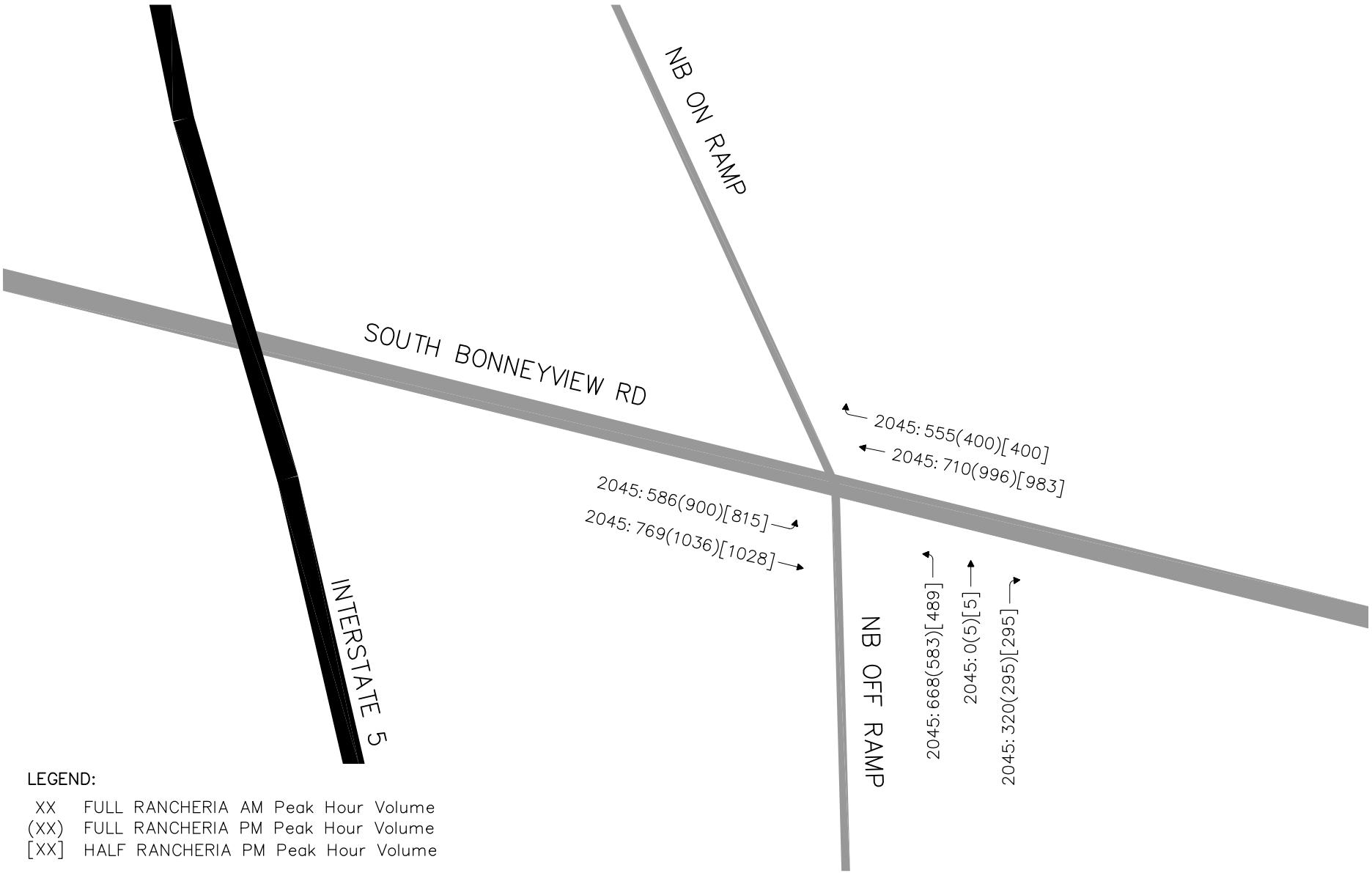
LEGEND:

XX FULL RANCHERIA AM Peak Hour Volume
(XX) FULL RANCHERIA PM Peak Hour Volume
[XX] HALF RANCHERIA PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 7

FINAL RANCHERIA TRAFFIC FORECASTS



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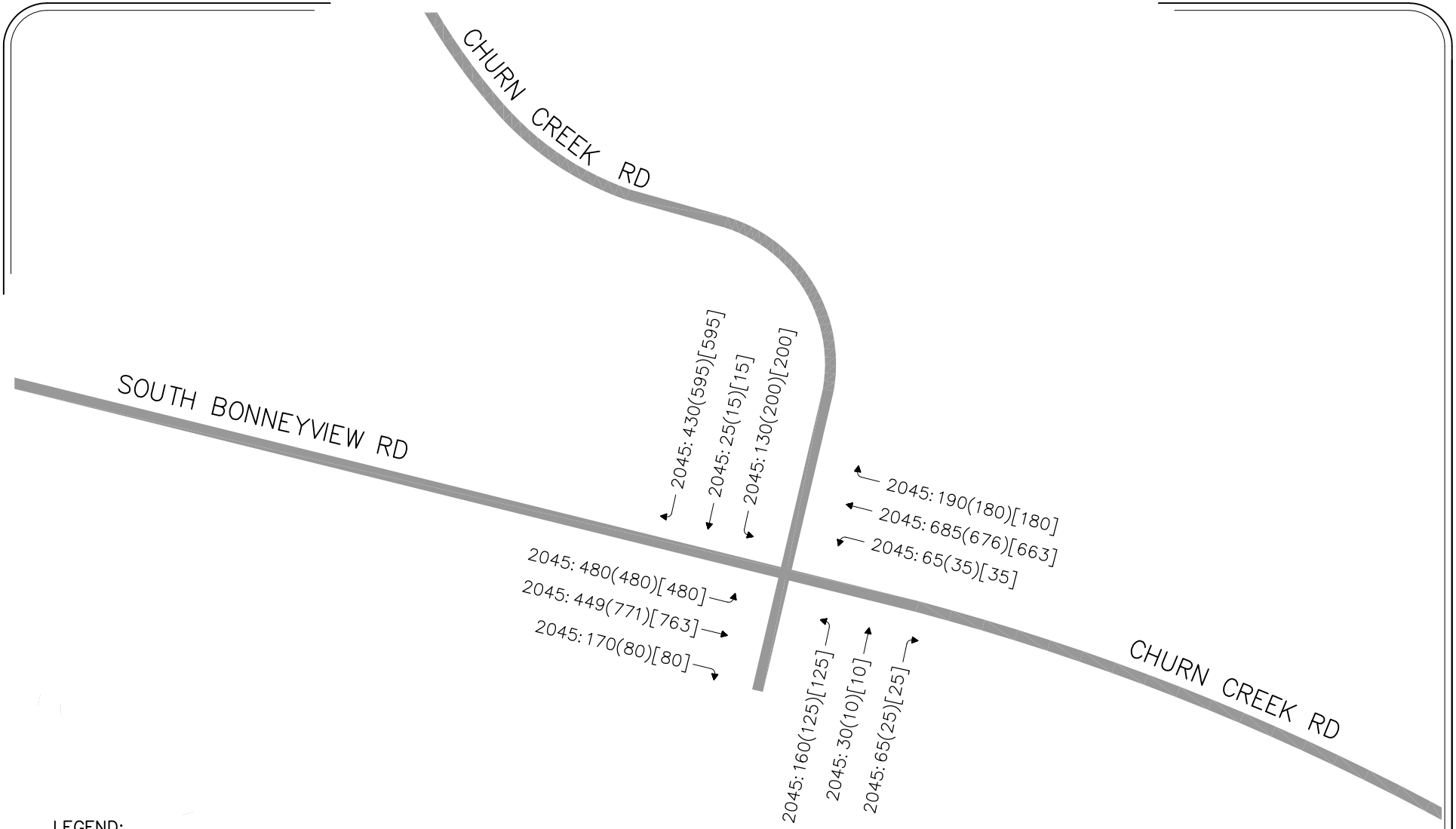
(XX) FULL RANCHERIA PM Peak Hour Volume
[XX] HALF RANCHERIA PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 8

FINAL RANCHERIA TRAFFIC FORECASTS



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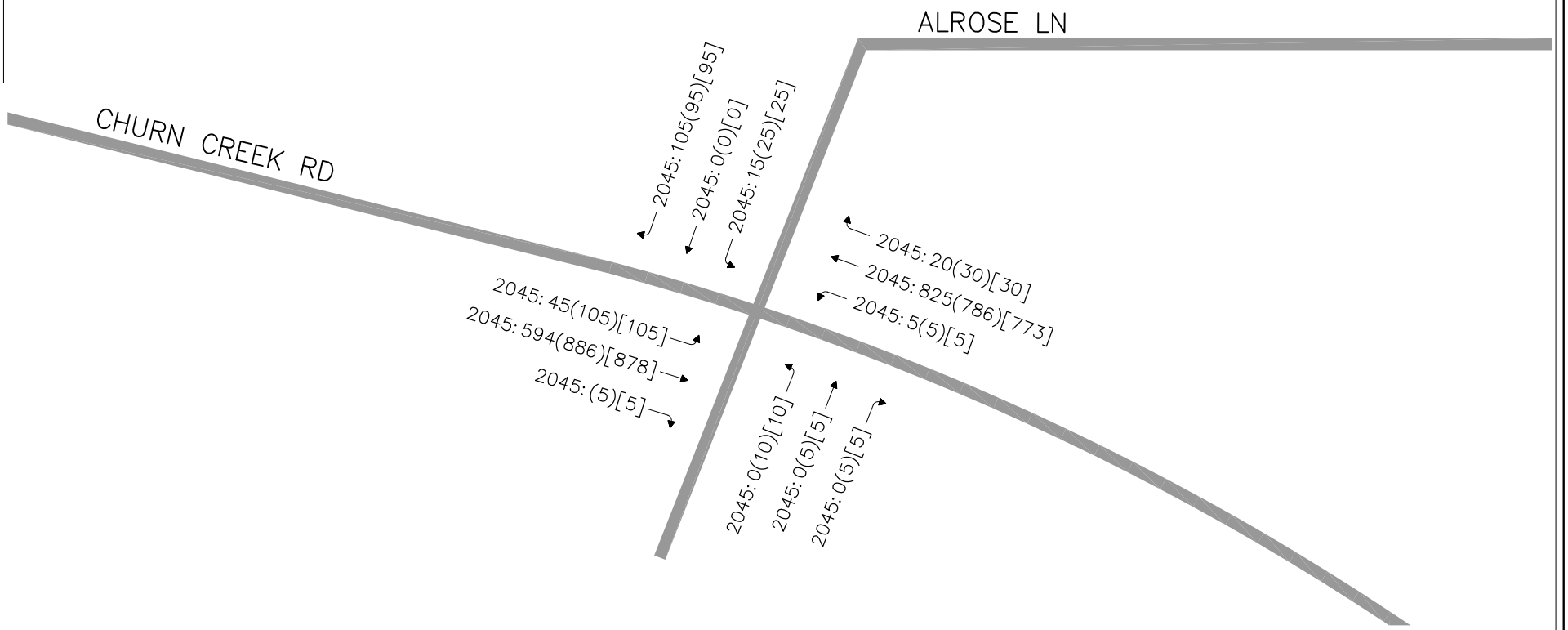
(XX) FULL RANCHERIA PM Peak Hour Volume
[XX] HALF RANCHERIA PM Peak Hour Volume

Figure 9

I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL RANCHERIA TRAFFIC FORECASTS



LEGEND:

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(XX) FULL RANCHERIA PM Peak Hour Volume
[XX] HALF RANCHERIA PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

Figure 10

FINAL RANCHERIA TRAFFIC FORECASTS

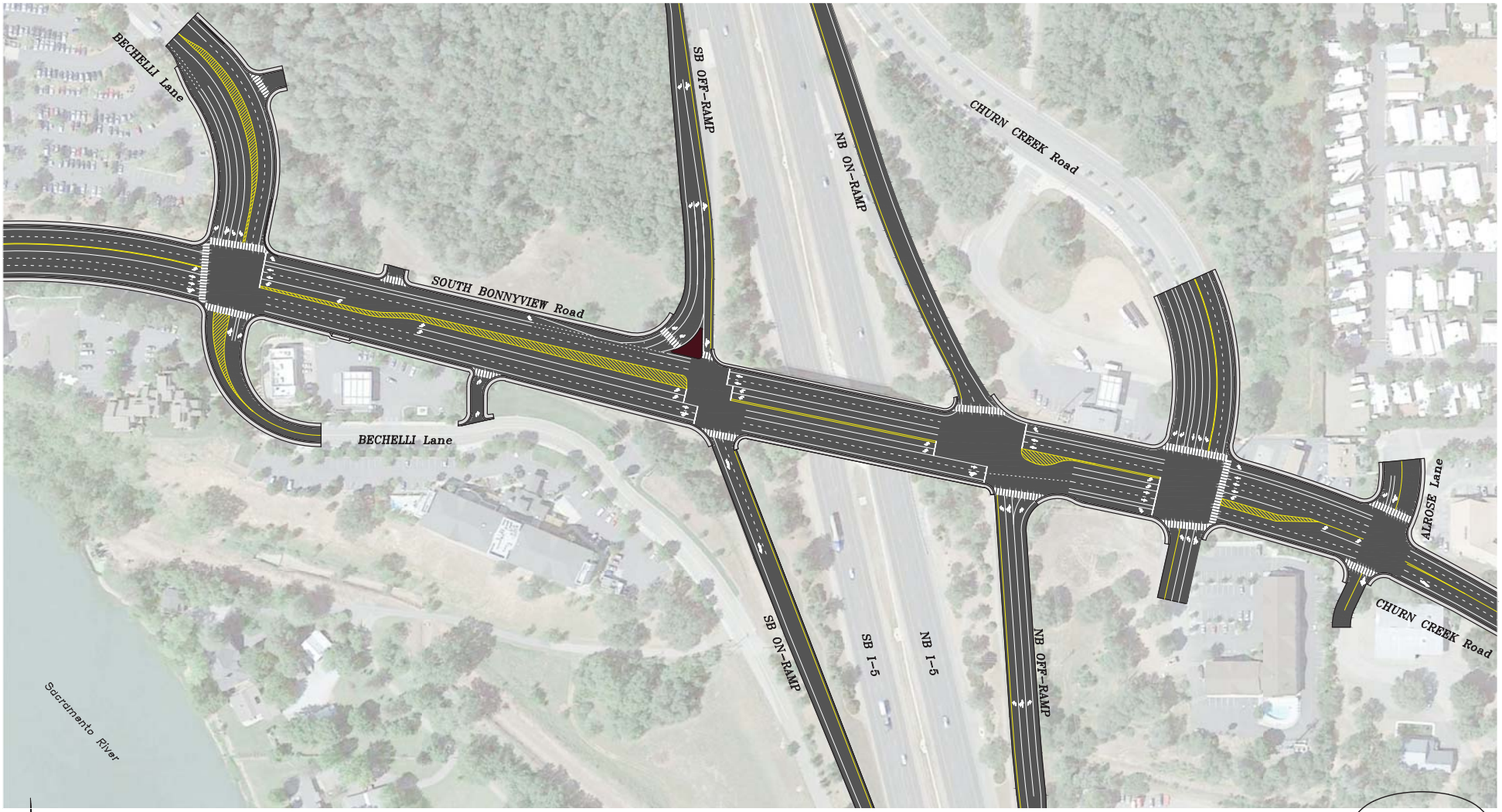

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FIGURE 11

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REDDING
330 Hartnell Ave. Suite B
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(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. JOB_NO.

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 1
TRADITIONAL TIGHT DIAMOND INTERCHANGE
REDDING, CALIFORNIA

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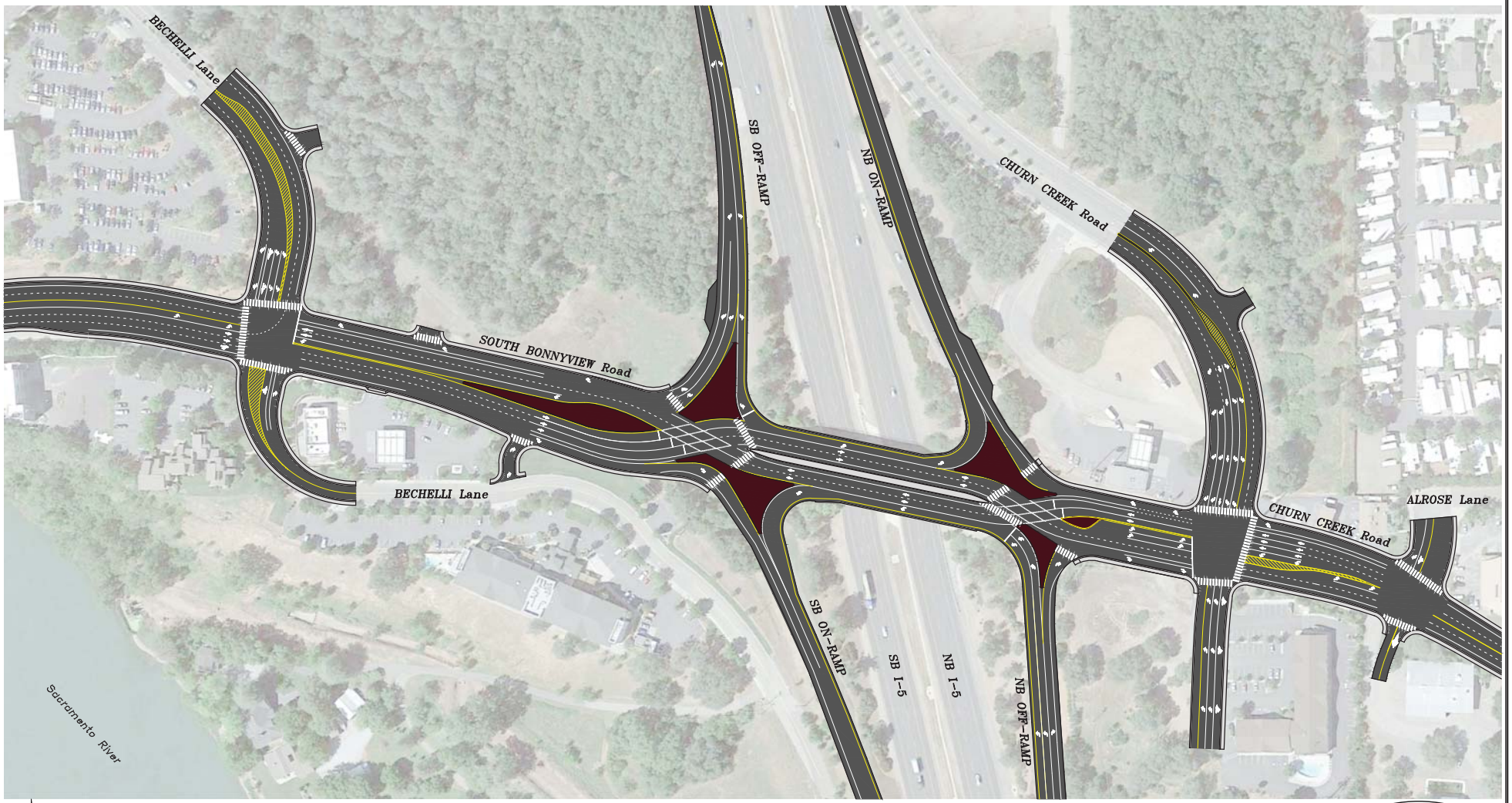

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FIGURE 12

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I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 2
DDI WITH TRADITIONAL SIGNALS
REDDING, CALIFORNIA

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Creek Road. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 12** for Alternative 2 geometry.

Alternative 3 – Roundabout Corridor

Alternative 3 proposes the use of modern roundabouts at the South Bonnyview Road intersections with Bechelli Lane, I-5 SB ramps, I-5 NB ramps and Churn Creek Road. Roundabouts provide circular intersections with fewer conflict points than traditional intersections. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 13** for Alternative 3 geometry.

Alternative 4 – DDI With Roundabouts at City Intersections

Alternative 4 proposes a hybrid of Alternatives 2 and 3 by using a DDI with roundabouts at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 14** for Alternative 4 geometry.

No-Build – Maintain Existing Roadway Geometry

The No-Build alternative applies the forecasted traffic volumes on the existing roadway geometry.

Alternative Dropped from Further Consideration

After completion of the year 2045 traffic operations analysis for Alternatives 1, 2, 3 and 4, the PDT decided that Alternative 3, Roundabout Corridor, would be dropped from further consideration. *Note: Refer to the Caltrans PSR for any discussion regarding this decision.*

With Rancheria Development Alternatives

As discussed in “Traffic Forecasts” above, traffic forecasts for Half Rancheria Development and Full Rancheria Development were applied to base Alternatives 1, 2 and 4, to create the following alternatives:

Alternative 1A – Traditional Tight Diamond Interchange (with Half Rancheria Development)

Alternative 1A perpetuates the Caltrans Type L-1 Tight Diamond interchange and uses traditional signal controls at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. Roadways and ramps are widened and ramps are lengthened to accommodate forecasted traffic. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 15** for Alternative 1A geometry.

Alternative 2A – Diverging Diamond Interchange (DDI) With Traditional Signals at City Intersections (with Half Rancheria Development)

Alternative 2A proposes a DDI that is a type of diamond interchange in which the two directions of traffic on the non-freeway road cross to the opposite side on both sides of the overcrossing at the freeway. It is unusual in that it requires traffic on the freeway overcrossing to briefly drive on the opposite side of the road from what is customary for the jurisdiction. Roadways and ramps are widened and ramps are lengthened to accommodate forecasted traffic. Traditional signal

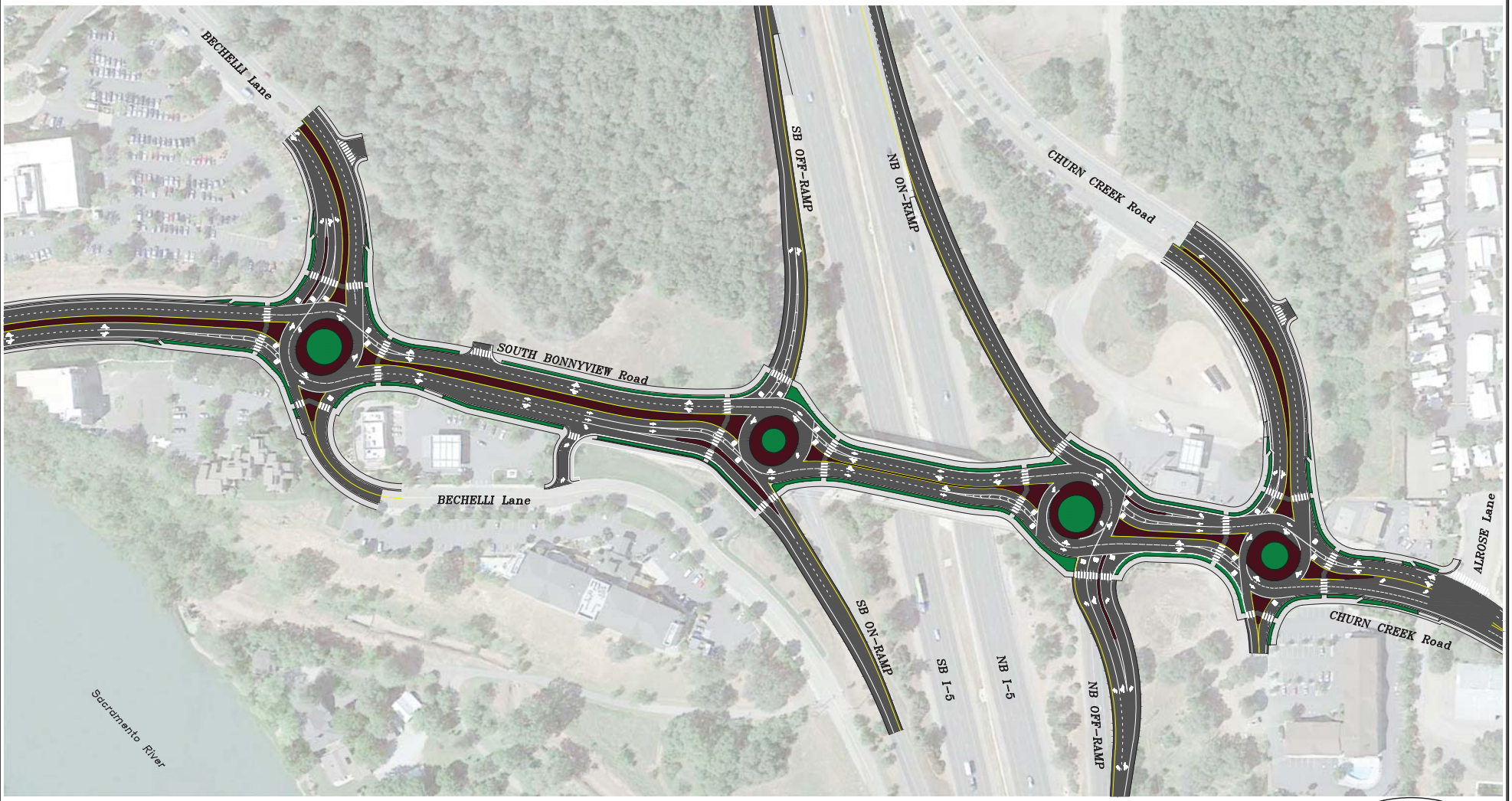

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FIGURE 13

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I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 3
ROUNDABOUT CORRIDOR
REDDING, CALIFORNIA

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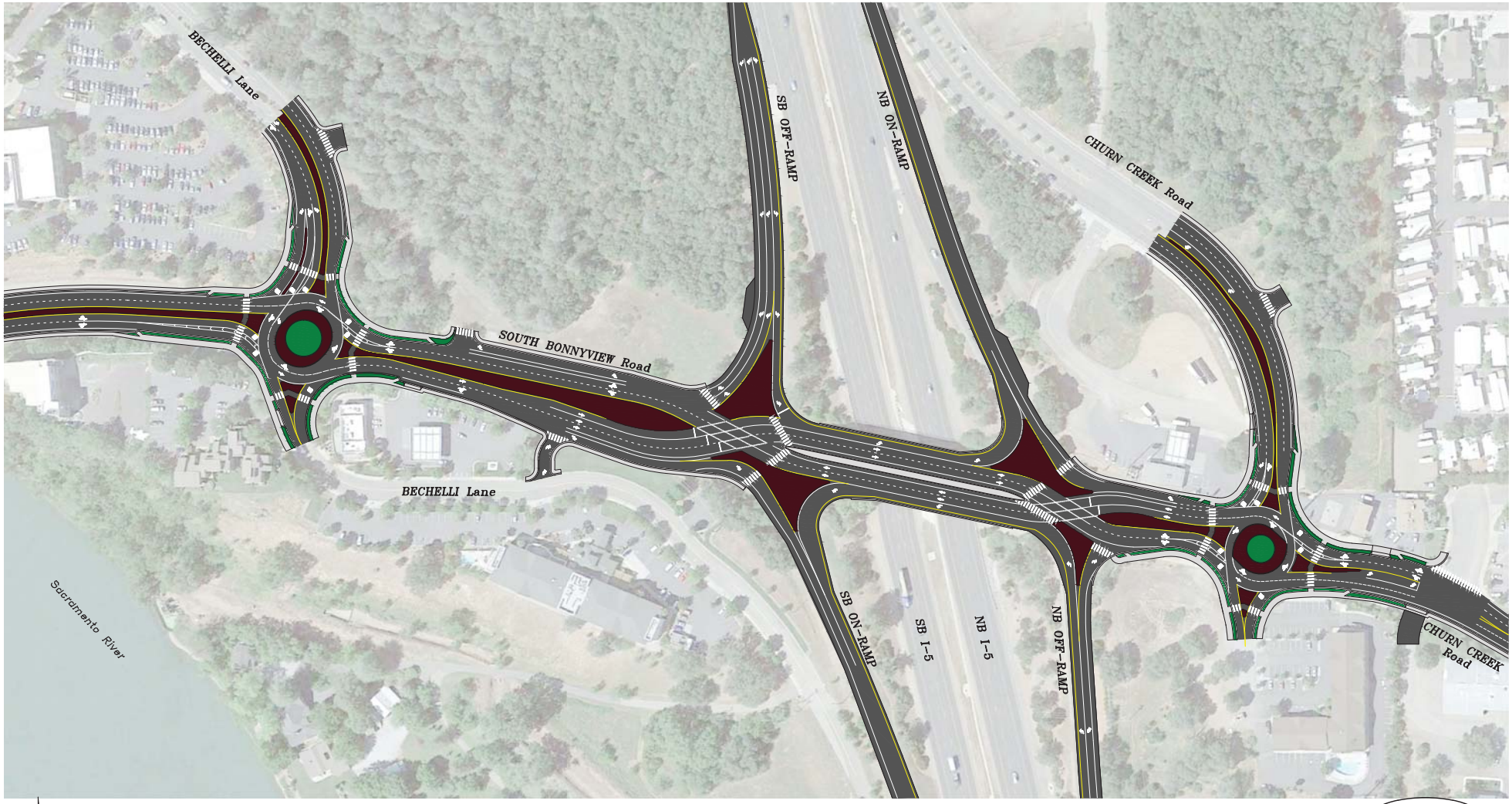

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FIGURE 14

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I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 4
DDI WITH ROUNDABOUTS
REDDING, CALIFORNIA

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FIGURE 15

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I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 1A
TRADITIONAL TIGHT DIAMOND
REDDING, CALIFORNIA

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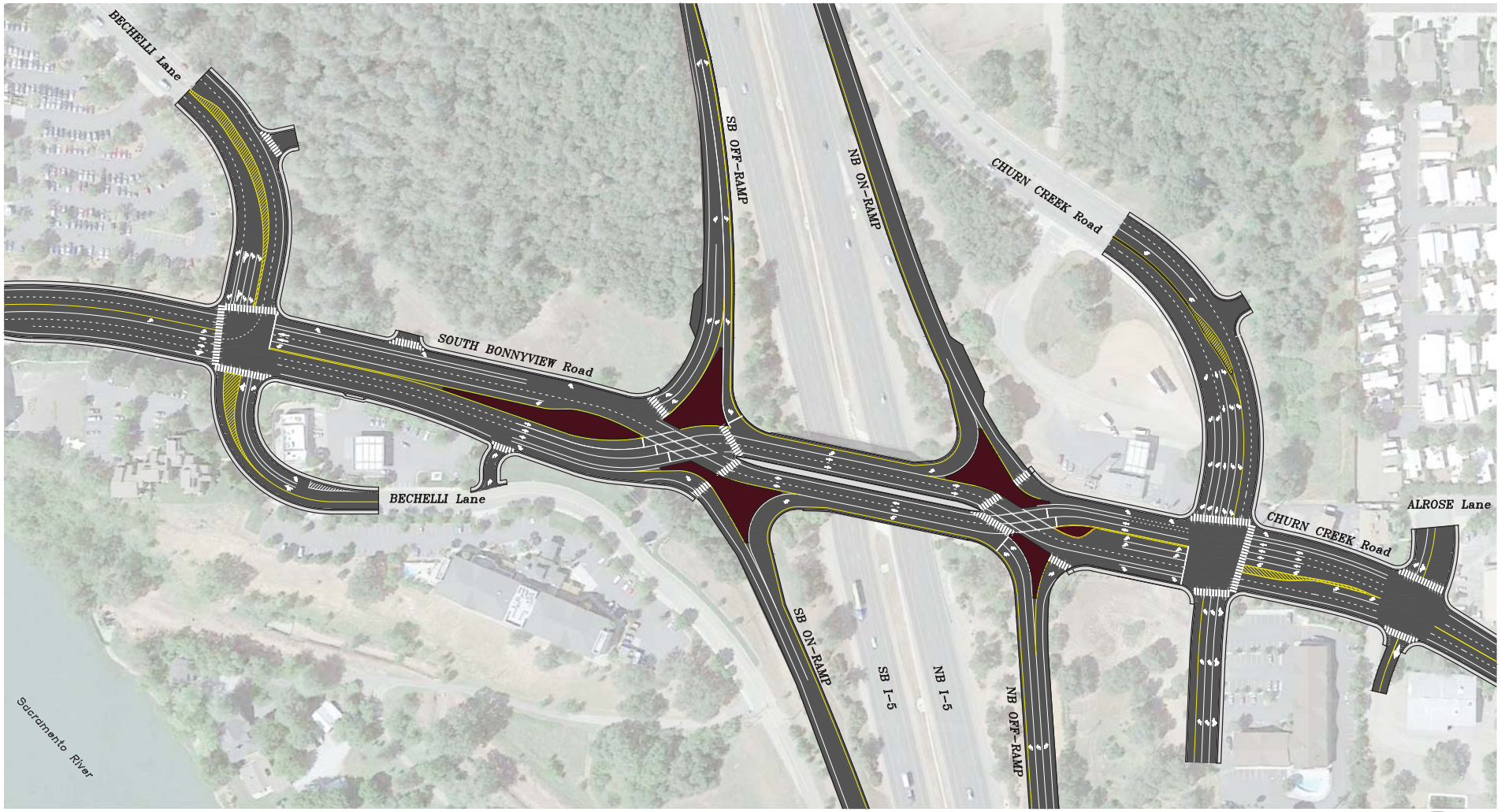

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FIGURE 16

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VISALIA

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I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 2A
DDI WITH TRADITIONAL SIGNALS
REDDING, CALIFORNIA

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controls are used at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 16** for Alternative 2A geometry.

Alternative 4A – DDI With Roundabouts at City Intersections (with Half Rancheria Development)

Alternative 4A proposes a hybrid of Alternatives 2 and 3 by using a DDI with roundabouts at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 17** for Alternative 4A geometry.

Alternative 1B – Traditional Tight Diamond Interchange (with Full Rancheria Development)

Alternative 1B perpetuates the Caltrans Type L-1 Tight Diamond interchange and uses traditional signal controls at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. Roadways and ramps are widened and ramps are lengthened to accommodate forecasted traffic. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 18** for Alternative 1B geometry.

Alternative 2B – Diverging Diamond Interchange (DDI) With Traditional Signals at City Intersections (with Full Rancheria Development)

Alternative 2B proposes a DDI that is a type of diamond interchange in which the two directions of traffic on the non-freeway road cross to the opposite side on both sides of the overcrossing at the freeway. It is unusual in that it requires traffic on the freeway overcrossing to briefly drive on the opposite side of the road from what is customary for the jurisdiction. Roadways and ramps are widened and ramps are lengthened to accommodate forecasted traffic. Traditional signal controls are used at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 19** for Alternative 2B geometry.

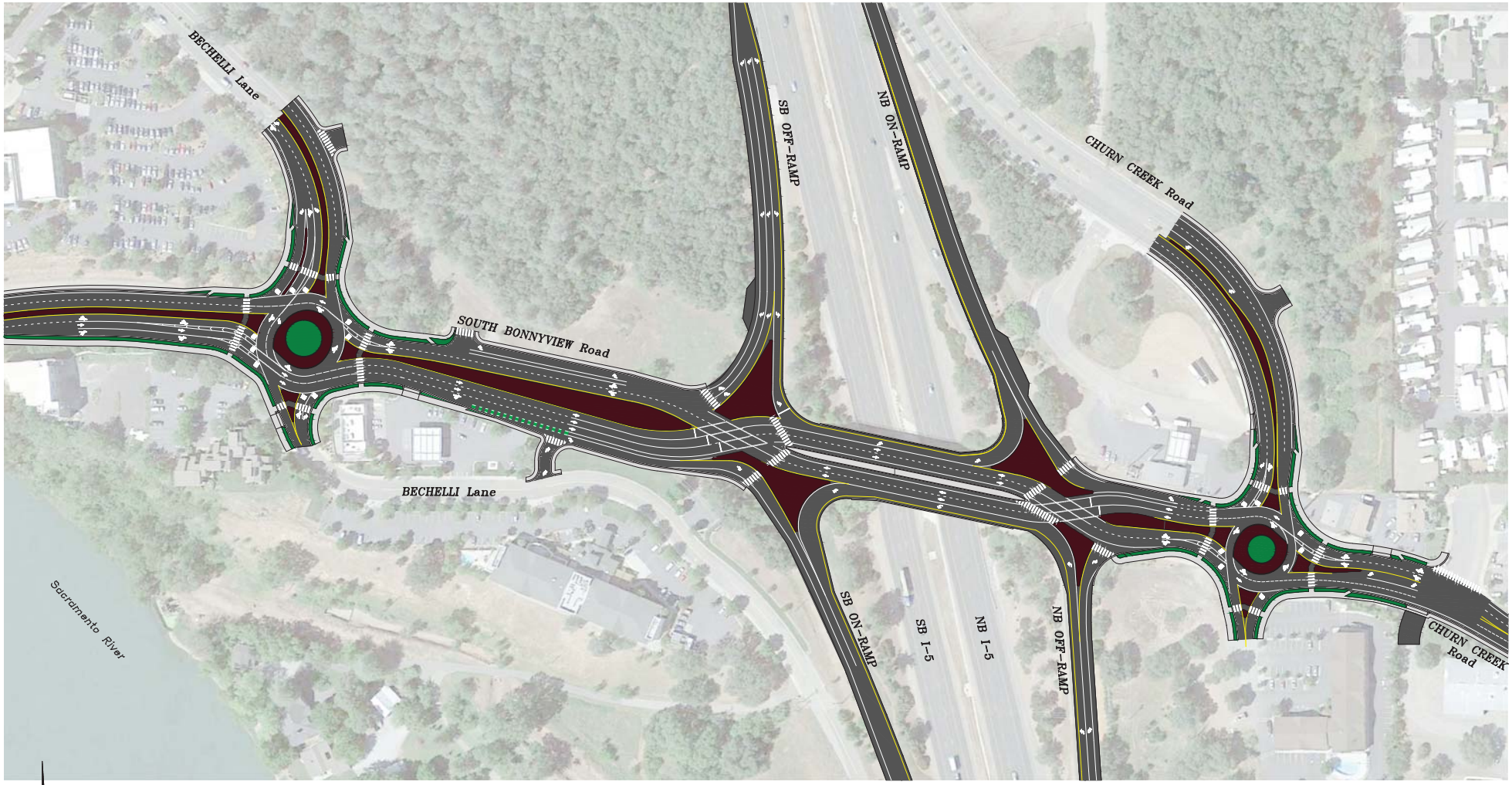
Alternative 4B – DDI With Roundabouts at City Intersections (with Full Rancheria Development)

Alternative 4B proposes a hybrid of Alternatives 2 and 3 by using a DDI with roundabouts at the South Bonnyview Road intersections with Bechelli Lane and Churn Creek Road. The Churn Creek Road intersection at Alrose Lane has stop control under this alternative. See **Figure 20** for Alternative 4B geometry.

Level of Service (LOS) and Vehicle Queuing Methodologies and Guidelines

General LOS Methodologies

Intersection and ramp level of services (LOS) have been calculated for all control types using the methods documented the Transportation Research Board publications *Highway Capacity Manual (HCM) 2000 and 2010*. LOS determinations are presented on a letter grade scale from



PRELIMINARY, NOT FOR CONSTRUCTION

FIGURE17

REVISIONS			
NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 4A
DDI WITH ROUNDABOUTS
REDDING, CALIFORNIA

SCALE	1"=80'
DESIGNED	MES
DRAWN	MES
CHECKED	RAW
FILE NAME	2174EX013
DATE	04/26/17

SHEET No. EX

1 OF 1

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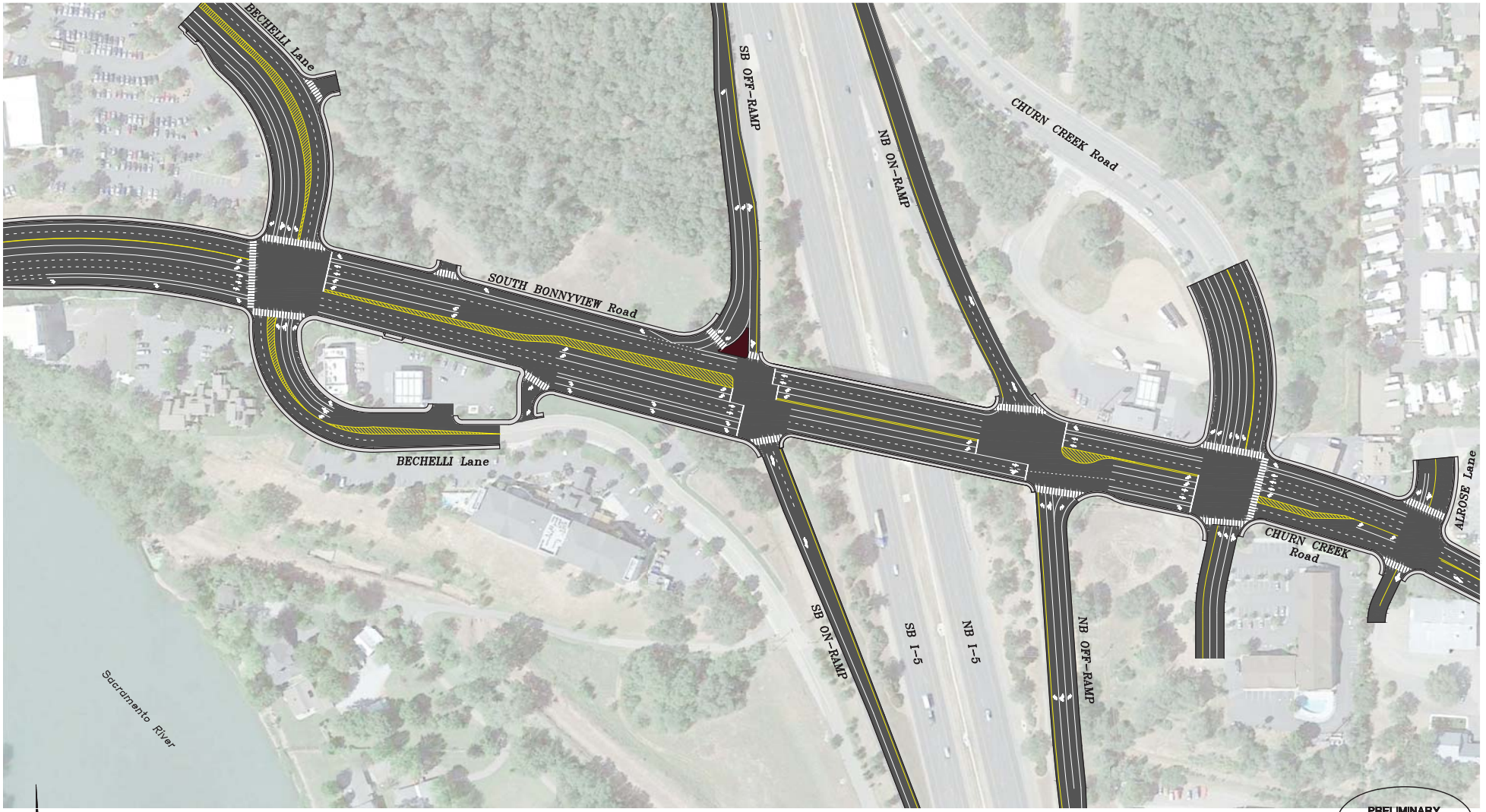

PRELIMINARY, NOT FOR CONSTRUCTION

FIGURE 18

REVISIONS			
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1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. JOB_NO.

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 1B
TRADITIONAL TIGHT DIAMOND
REDDING, CALIFORNIA

SCALE	1"=80'
DESIGNED	MES
DRAWN	MES
CHECKED	RAW
FILE NAME	2174EX021
DATE	04/26/17

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1 OF 1

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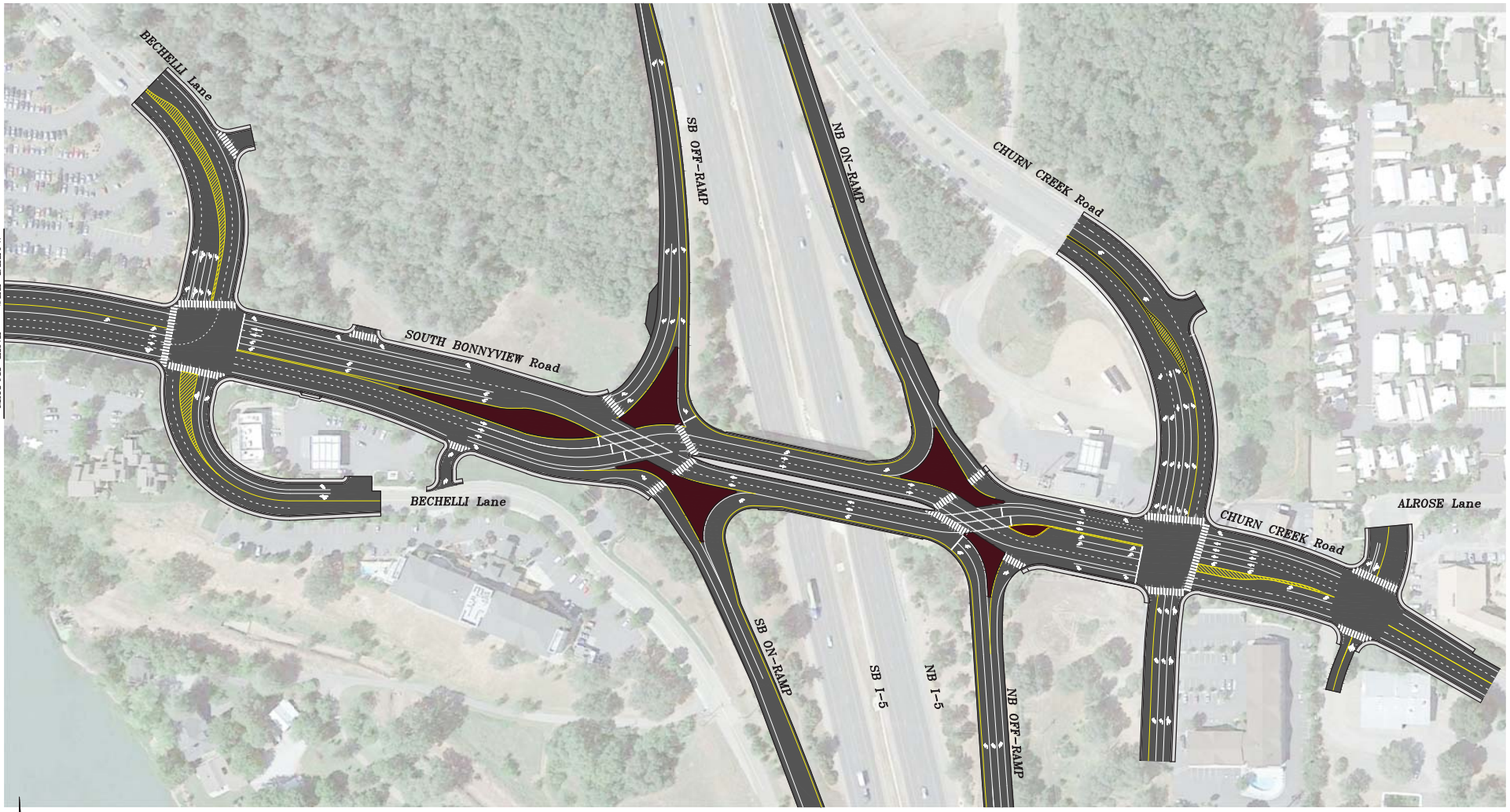

PRELIMINARY, NOT FOR CONSTRUCTION

FIGURE 19

REVISIONS			
NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
REDDING
530 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations In
ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 2B
DDI WITH TRADITIONAL SIGNALS
REDDING, CALIFORNIA

SCALE	1"=80'
DESIGNED	MES
DRAWN	MES
CHECKED	RAW
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DATE	04/26/17

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1 OF 1

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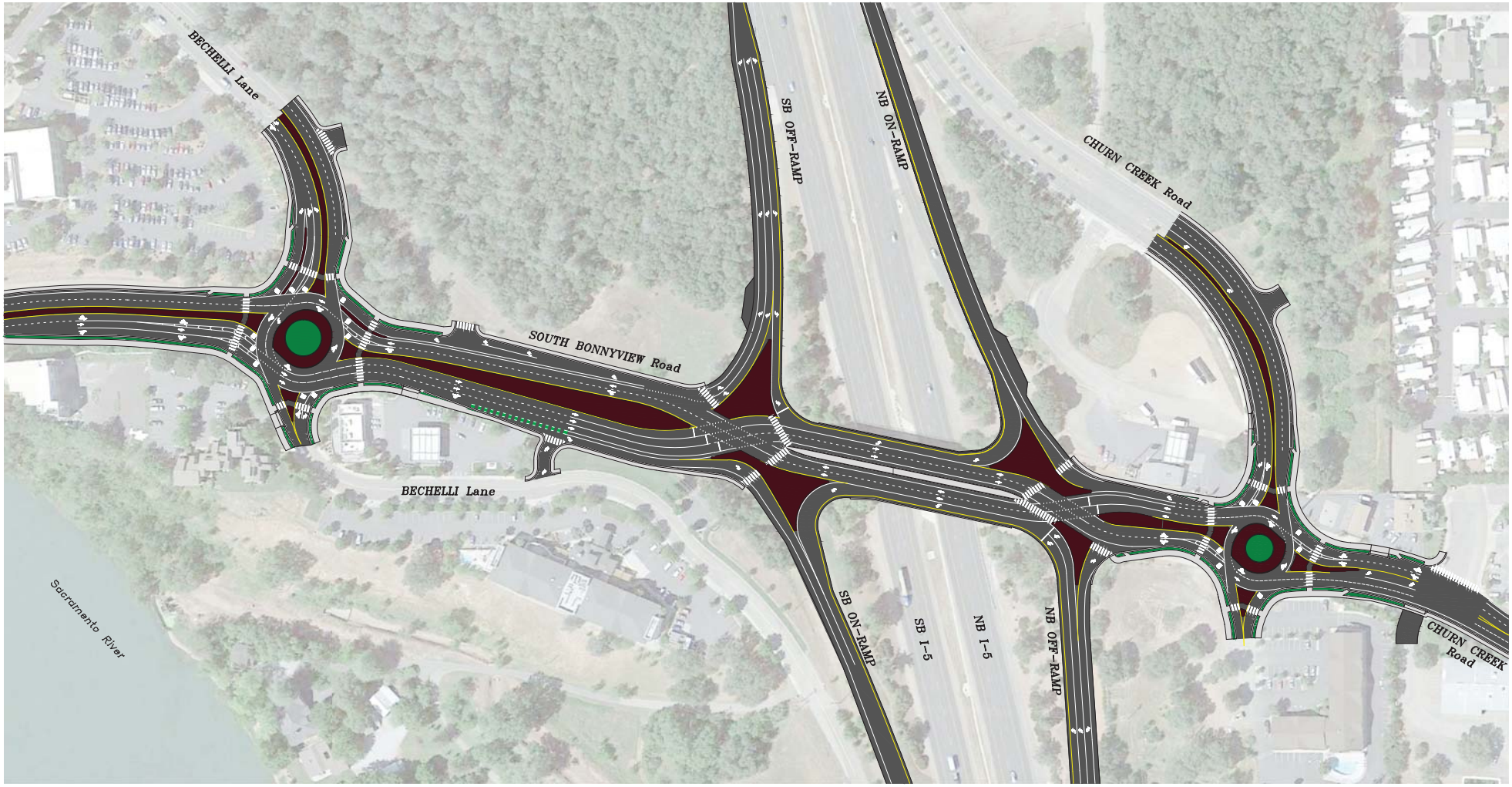

PRELIMINARY, NOT FOR CONSTRUCTION

FIGURE 20

REVISIONS			
NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
ALTERNATIVE 4B
DDI WITH ROUNDABOUTS
REDDING, CALIFORNIA

SCALE	1"=80'
DESIGNED	SMH
DRAWN	SMH
CHECKED	RAW
FILE NAME	2174EX025
DATE	04/26/17

SHEET No. EX

1 OF 1

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"A" to "F", whereby LOS "A" represents "free-flow" conditions and LOS "F" represents over capacity conditions.

Intersection LOS and Vehicle Queuing Methodologies

Intersection LOS is calculated for all control types. **Table 2** presents the LOS definitions for different types of intersection controls.

Due to the different intersection control types, different software tools were used depending on the intersection control, as further described in TM# 7 in the Appendix.

TABLE 2
LEVEL OF SERVICE (LOS) CRITERIA FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle		
				Signalized or Roundabout	Un signalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	<10.0	<10.0	<10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0	>25.0 and <35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0	>35.0 and <50.0

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle		
				Signalized or Roundabout	Un signalized	All-Way Stop
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0	>50.0

References: 2000 Highway Capacity Manual

Synchro Parameters for Traffic Signals

Snychro, by *Trafficware Group Inc.*, is an analysis and optimization software application that implements the analysis methods contained in HCM 2000 and 2010. For both intersection LOS and vehicle queuing, the technical parameters presented in **Table 3** were used for traditional traffic signals:

TABLE 3
SYNCHRO TECHNICAL PARAMETERS FOR SIGNALIZED INTERSECTIONS

1	Analysis Period - 15 Minutes
2	Peak Hour Factor (PHF)- 0.92 or higher for Year 2025, 2035 and 2045 conditions. PHF greater than 0.92 due to Existing counts showing PHF higher.
3	% Trucks: weekday peak hour analysis - from counts
4	Flat Grade
5	25 ft. assumed vehicle length for stacking and queues
6	Cycle Length - 80 sec min, 150 sec max (optimize signal timing)
7	Coordinated Cycle Length - obtained from City and Caltrans (optimize signal timing for Year 2025, 2035 & 2045 conditions)
8	Total Lost Time Per Signal Phase - 4 seconds (24 sec max for 8-phase signal)
9	Ideal saturation flow rate - 1,900 vhp or 1,710 vhp as provided in the HCM
10	Pedestrian Speed - 3.5 ft/s and 10 mph for bicycles
11	Pedestrian calls - 2025 (6); 2035 (10); 2045 (15). Existing ranges from 0 to 3
Source: Figure 4.5 City of Redding TIA Guideline January 2009, modified as appropriate	

SIDRA Parameters for Roundabouts

SIDRA Intersection is an analysis and optimization software application that uses both gap-acceptance and roundabout geometry to analyze roundabout performance. For roundabout intersection LOS calculations, the technical parameters in **Table 4** were used:

TABLE 4
SIDRA TECHNICAL PARAMETERS FOR ROUNDABOUT INTERSECTIONS

SIDRA standard model will be used for roundabouts analysis.
A 1.1 environmental factor will be used in SIDRA for Year 2025 conditions, 1.05 for Year 2035 conditions and 1.0 for design year conditions.
PHF, heavy vehicles and pedestrians consistent with the Table 1 parameters.
Omni-Means verified that the SIDRA truck length corresponds with expected conditions.

VISSM Parameters for a DDI

VISSIM, by *PTV Planung Transport Verkehr AG*, is an analysis and optimization software application that uses behavior-based modeling of complex transportation geometry. For both intersection LOS and vehicle queuing, the technical parameters in **Table 5** were used for the DDI ramp intersections:

TABLE 5
VISSM TECHNICAL PARAMETERS FOR DDI INTERSECTIONS

The DDI will be modeled in VISSIM based on the preliminary concept prepared by Caltrans.
80 second minimum cycle length will be utilized.
PHF, heavy vehicles and pedestrians consistent with the Table 1 parameters.
Signal phasing will be based on the information published within the Diverging Diamond Interchange informational guide (FHWA, August 2014)

VISSM Parameters for Roundabouts

For vehicle queuing, the technical parameters in **Table 6** were used for roundabout intersections:

TABLE 6
VISSM TECHNICAL PARAMETERS FOR ROUNDABOUTS INTERSECTIONS

The roundabout interchange will be modeled in VISSIM based on preliminary concepts prepared by Omni-Means.
PHF, heavy vehicles and pedestrians consistent with the Table 1 parameters.
Conflict areas and/or priority rules are the two methods in VISSIM to simulate vehicle yielding behavior at the entry. We will use these methods to model the vehicle yielding behavior at the entries.

LOS Standards

The following LOS standards are applied in this TOR:

- LOS D or better for I-5 ramp intersections. The two ramp intersections have a LOS D standard due to the City's General Plan LOS D standard for "freeway interchanges".
- LOS D or better for South Bonnyview Road / Bechelli Lane and South Bonnyview Road / Churn Creek Road intersections. These two City intersections have a LOS D standard due to the City's General Plan LOS D standard for "river crossings".
- LOS C or better for Churn Creek Road / Alrose lane.

Additional information regarding City and Caltrans LOS guidelines and standards are provided in the following sections.

City LOS Guidelines

The City currently maintains its General Plan Transportation Element that is accessible via the following internet site: *http://www.cityofredding.org/home/showdocument?id=5513.* The Transportation Element contains the following information of particular interest to this study:

> *Policy T1A: Establish the following peak-hour LOS standards for transportation planning and project review. They reflect the special circumstances of various areas of the community:*
>
> - *Use LOS "C" – for most arterial streets and their intersections.*
> - *Use LOS "D" – for the Downtown area where vitality, activity, and pedestrian and transit use are primary goals.*
> - *Use LOS "D" – for streets within the State highway system and interchanges.*
> - *Use LOS "D" – for river-crossing street corridors whose capacity is affected by adjacent intersections.*

Caltrans LOS Guidelines

The Caltrans published *Guide for the Preparation of Traffic Impact Studies* (dated December 2002) states the following:

> *"Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS."*

Vehicle Queue Standards

Vehicle queues are considered acceptable within this TOR if the queues are accommodated within the "pocket" area for left- and right-turn lanes. When thru-movement queues are longer than an adjacent left- or right-turn lane pocket, the queues are considered unacceptable and the left-and right-turn pockets must be lengthened to allow access to the turn pockets.

No Build Conditions Analysis

The base (Without Rancheria Development) forecasted traffic volumes were applied to the existing geometry to determine the LOS and vehicle queues.

No Build conditions analysis was not performed for the "With Rancheria Development" forecasted traffic volumes.

Year 2015 No Build Conditions (Without Rancheria Development)

Year 2015 conditions are contained within the *South Bonnyview / Churn Creek Retail Center Traffic Impact Analysis Report, Omni-Means, May 2016*.

Year 2015 LOS and delays for the existing geometry are presented in **Table 7.**

TABLE 7
YEAR 2015 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/Bechelli Lane	Signal	C	17.2	B	-	22.4	C	-
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	28.4	C	-	27.3	C	-
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	32.5	C	-	29.8	C	-
4	S. Bonnyview Rd/Churn Creek Rd	Signal	C	17.2	B	-	22.4	C	-
5	**Churn Creek Rd/Alrose Lane**	**TWSC**	**C**	13.6	B	-	**26.9**	**D**	**No**

Notes:

1 TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2015 critical queues for the existing geometry are presented in **Table 8**.

TABLE 8
YEAR 2015 INTERSECTION VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Existing 95th Percentile Queue (ft) AM Peak Hour	Existing 95th Percentile Queue (ft) PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	**251**	145	200
	Eastbound Thru		241	228	
	Eastbound Thru/Right		149	170	
	Westbound Left		49	43	145
	Westbound Thru		199	214	
	Westbound Right		98	51	200
	Northbound Left/Thru		69	74	
	Northbound Right		**57**	**52**	30
	Southbound Left		139	216	
	Southbound Left/Thru		87	189	
	Southbound Right		100	155	190
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	**255**	**269**	250
	Eastbound Right		92	140	250
	Westbound Left		155	228	
	Westbound Thru		131	181	
	Southbound Left/Thru		113	**192**	175
	Southbound Right		309	253	
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	463	418	
	Eastbound Thru		189	216	
	Westbound Thru		164	222	
	Westbound Right		**121**	102	110
	Northbound Left/Thru		341	227	
	Northbound Right		87	96	285
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**168**	**147**	130
	Eastbound Thru		76	167	
	Westbound Left		-	8	
	Westbound Thru		91	11	
	Westbound Thru/Right		161	97	
	Northbound Left/Thru		5	111	
	Northbound Right		12	25	
	Southbound Left/Thru		80	159	
	Southbound Right		99	176	

TABLE 8
YEAR 2015 INTERSECTION VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	Existing 95th Percentile Queue (ft) AM Peak Hour	PM Peak Hour	Available Storage
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left/Thru/Right	Signal	90	153	
	Westbound Left/Thru		-	7	
	Westbound Thru/Right		-	4	
	Northbound Left/Thru/Right		-	34	
	Southbound Thru	Signal	235	340	
	Southbound Thru/Right		200	259	

1. Worst lane movement (of the approach) value stated.

Year 2025 No Build Conditions (Without Rancheria Development)

Year 2025 No Build conditions are presented in TM# 13 in the Appendix.

Year 2025 No Build LOS and delays for the existing geometry are presented in **Table 9**.

TABLE 9
YEAR 2025 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	**S. Bonnyview Rd/Bechelli Lane**	**Signal**	**C**	20.5	C	**76.3**	**E**
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	30.2	C	45.2	D
3	**S. Bonnyview Rd/I-5 NB Ramps**	**Signal**	**D**	45.4	D	**64.9**	**E**
4	S. Bonnyview Rd/Churn Creek Rd	Signal	C	27.7	C	26.5	C
5	**Churn Creek Rd/Alrose Lane**	**TWSC**	**C**	16.8	C	**64.8**	**F**

Notes:
1 TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2025 critical queues for the existing geometry are presented in **Table 10**.

TABLE 10
YEAR 2025 95TH PERCENTILE VEHICLES QUEUES

Int. #	Intersection/Approach	Control Type	Year 2025 - 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	**259**	**333**	200
	Eastbound Thru		348	525	
	Eastbound Thru/Right		251	468	
	Westbound Left		52	42	145
	Westbound Thru		239	230	
	Westbound Right		130	128	200
	Northbound Left/Thru		60	71	
	Northbound Right		45	54	75
	Southbound Left		116	420	
	Southbound Left/Thru		82	439	
	Southbound Right		88	**273**	110
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	**418**	**918**	250
	Eastbound Right		100	**364**	250
	Westbound Left		183	199	380
	Westbound Thru		119	132	
	Southbound Left/Thru		319	518	
	Southbound Right		**324**	**521**	180
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	**466**	**421**	380
	Eastbound Thru		250	408	
	Westbound Thru		251	254	
	Westbound Right		**233**	**185**	110
	Northbound Left/Thru		338	286	
	Northbound Right		137	169	285

TABLE 10
YEAR 2025 95TH PERCENTILE VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	Year 2025 - 95th Percentile Queue (ft) AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**205**	**276**	130
	Eastbound Thru		231	311	
	Eastbound Right		83	91	115
	Westbound Left		**100**	**78**	75
	Westbound Thru		206	214	
	Westbound Thru/Right		254	254	
	Northbound Left/Thru		206	215	
	Northbound Right		-	170	
	Southbound Left/Thru		580	590	
	Southbound Right		-	-	
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left/Thru/Right	TWSC	94	118	
	Westbound Left/Thru		68	12	
	Westbound Thru/Right		162	76	
	Northbound Left/Thru/Right		-	43	
	Southbound Left/Thru		38	54	
	Southbound Right		116	77	

1. Worst lane movement (of the approach) value stated.

Year 2035 No Build Conditions (Without Rancheria Development)

Year 2035 No Build conditions are presented in TM# 13 in the Appendix.

Year 2035 No Build LOS and delays for the existing geometry are presented in **Table 11**.

TABLE 11
YEAR 2035 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	**S. Bonnyview Rd/Bechelli Lane**	**Signal**	**C**	22.3	C	**109.4**	**F**
2	**S. Bonnyview Rd/I-5 SB Ramps**	**Signal**	**D**	44.7	D	**55.9**	**E**
3	**S. Bonnyview Rd/I-5 NB Ramps**	**Signal**	**D**	**97.0**	**F**	**86.1**	**F**
4	S. Bonnyview Rd/Churn Creek Rd	Signal	C	28.6	C	28.0	C
5	**Churn Creek Rd/Alrose Lane**	**TWSC**	**C**	19.5	C	**101.0**	**F**

Notes:
1 TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2035 critical queues for the existing geometry are presented in **Table 12**.

TABLE 12
YEAR 2035 95TH PERCENTILE VEHICLES QUEUES

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	**342**	**415**	200
	Eastbound Thru		542	702	
	Eastbound Thru/Right		485	684	
	Westbound Left		71	62	145
	Westbound Thru		**246**	239	
	Westbound Right		145	133	200
	Northbound Left/Thru		78	99	
	Northbound Right		59	72	75
	Southbound Left		**181**	407	
	Southbound Left/Thru		124	437	
	Southbound Right		80	**281**	110
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	**856**	**948**	250
	Eastbound Right		250	**413**	250
	Westbound Left		183	231	380
	Westbound Thru		143	126	
	Southbound Left/Thru		605	502	
	Southbound Right		**476**	**549**	180
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	**456**	**416**	380
	Eastbound Thru		357	393	
	Westbound Thru		265	278	
	Westbound Right		**139**	**229**	110
	Northbound Left/Thru		401	336	
	Northbound Right		167	247	285

TABLE 12
YEAR 2035 95TH PERCENTILE VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft) AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**232**	**254**	130
	Eastbound Thru		249	300	
	Eastbound Right		101	70	115
	Westbound Left		**100**	**83**	75
	Westbound Thru		219	214	
	Westbound Thru/Right		251	246	
	Northbound Left/Thru		230	194	
	Northbound Right		-	-	
	Southbound Left/Thru		587	587	
	Southbound Right		-	-	
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left/Thru/Right	TWSC	106	120	
	Westbound Left/Thru		93	71	
	Westbound Thru/Right		193	154	
	Northbound Left/Thru/Right		-	48	
	Southbound Left/Thru		67	87	
	Southbound Right		139	136	

1. Worst lane movement (of the approach) value stated.

Year 2045 No Build Conditions (Without Rancheria Development)

Year 2045 No Build conditions are presented in TM# 13 in the Appendix.

Year 2045 No Build LOS and delays for the existing geometry are presented in **Table 13**.

TABLE 13
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	**S. Bonnyview Rd/Bechelli Lane**	**Signal**	**C**	24.5	C	**146.6**	**F**
2	**S. Bonnyview Rd/I-5 SB Ramps**	**Signal**	**D**	**64.4**	**E**	**65.5**	**E**
3	**S. Bonnyview Rd/I-5 NB Ramps**	**Signal**	**D**	**60.7**	**E**	**108.2**	**F**
4	**S. Bonnyview Rd/Churn Creek Rd**	**Signal**	**C**	31.5	C	**35.2**	**D**
5	**Churn Creek Rd/Alrose Lane**	**TWSC**	**C**	23.3	C	**176.3**	**F**

Notes:
1 TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2045 critical queues for the existing geometry are presented in **Table 14**.

TABLE 14
YEAR 2045 95TH PERCENTILE VEHICLES QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	**377**	**398**	200
	Eastbound Thru		644	709	
	Eastbound Thru/Right		598	708	
	Westbound Left		87	71	145
	Westbound Thru		255	243	
	Westbound Right		149	152	200
	Northbound Left/Thru		72	106	
	Northbound Right		52	**91**	75
	Southbound Left		179	388	
	Southbound Left/Thru		152	403	
	Southbound Right		100	**286**	110
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	**923**	**947**	250
	Eastbound Right		**276**	**491**	250
	Westbound Left		202	208	380
	Westbound Thru		134	130	
	Southbound Left/Thru		610	496	
	Southbound Right		**523**	**553**	180
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	**451**	**429**	380
	Eastbound Thru		381	393	
	Westbound Thru		255	276	
	Westbound Right		**232**	**243**	110
	Northbound Left/Thru		513	309	
	Northbound Right		**340**	220	285

TABLE 14
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**244**	**260**	130
	Eastbound Thru		276	306	
	Eastbound Right		98	82	115
	Westbound Left		**107**	**82**	75
	Westbound Thru		225	228	
	Westbound Thru/Right		239	257	
	Northbound Left/Thru		234	218	
	Northbound Right		-	-	
	Southbound Left/Thru		585	579	
	Southbound Right		-	-	
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left/Thru/Right	TWSC	116	122	
	Westbound Left/Thru		141	102	
	Westbound Thru/Right		299	220	
	Northbound Left/Thru/Right		-	64	
	Southbound Left/Thru		140	117	
	Southbound Right		211	151	

1. Worst lane movement (of the approach) value stated.

Alternative 1, 1A and 1B Conditions Analysis (Traditional Tight Diamond)

The Alternative 1's represent a "build" condition that is assumed to be in operation in year 2025. The critical consideration is whether the alternatives will provide acceptable traffic operations after 20-years (year 2045). In order to present data that can be used for a 10-year design life interim phase, year 2035 traffic operations are also considered.

Alternative 1 Condition Analysis

Year 2035 Alternative 1 Conditions (Without Rancheria Development)

Year 2035 Alternative 1 conditions are presented in TM# 11 (Revised) in the Appendix.

Year 2035 Alternative 1 LOS and delays are presented in **Table 15**.

TABLE 15
YEAR 2035 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.5	C	26.7	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	22.3	C	25.3	C
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	25.0	C	25.0	C
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	29.1	C	28.4	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	13.2	B	20.7	C

Notes:
1 TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

Year 2035 critical queues are presented in **Table 16**.

TABLE 16
YEAR 2035 95TH PERCENTILE VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	277	211	400
	Eastbound Thru		224	227	
	Eastbound Thru/Right		200	243	350
	Westbound Left		109	78	150
	Westbound Thru		325	348	
	Westbound Right		132	133	550
	Northbound Left/Thru		62	81	
	Northbound Right		45	59	75
	Southbound Left		63	193	300
	Southbound Left/Thru		80	276	
	Southbound Right		87	157	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	155	226	490
	Eastbound Right		104	250	350
	Westbound Left		152	182	
	Westbound Thru		209	217	
	Southbound Left		111	140	300
	Southbound Left/Thru		107	144	
	Southbound Right		215	212	300
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	245	367	
	Eastbound Thru		172	209	
	Westbound Thru		259	276	
	Westbound Right		235	178	
	Northbound Left		278	255	450
	Northbound Left/Thru		320	294	
	Northbound Right		125	154	400

TABLE 16
YEAR 2035 95TH PERCENTILE VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**187**	**212**	175
	Eastbound Thru		123	218	
	Eastbound Right		82	92	145
	Westbound Left		88	57	
	Westbound Thru		225	212	
	Westbound Right		106	114	200
	Northbound Left		107	131	
	Northbound Thru/Right		108	68	
	Southbound Left		97	148	225
	Southbound Thru		45	31	
	Southbound Right		115	182	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left	TWSC	49	71	110
	Westbound Left/Thru		17	48	
	Westbound Thru/Right		12	18	
	Northbound Left/Thru/Right		-	42	
	Southbound Left/Thru		28	39	
	Southbound Right		71	60	

1. Worst lane movement (of the approach) value stated.

Year 2045 Alternative 1 Conditions (Without Rancheria Development)

Year 2045 Alternative 1 conditions are presented in TM# 14 in the Appendix.

Year 2045 Alternative 1 LOS and delays for the existing geometry are presented in **Table 17**.

TABLE 17
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.2	C	29.7	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	22.6	C	26.2	C
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	25.7	C	27.4	C
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	28.6	C	27.1	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	13.8	B	23.5	C

Notes:
1 LOS = Delay based on average of all approaches for Roundabout
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 18**.

TABLE 18
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	Year 2045 - 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	475	306	400
	Eastbound Thru		406	266	
	Eastbound Thru/Right		229	223	350
	Westbound Left		128	138	150
	Westbound Thru		378	339	
	Westbound Right		154	129	550
	Northbound Left/Thru		70	87	
	Northbound Right		48	65	75
	Southbound Left		72	301	300
	Southbound Left/Thru		95	381	
	Southbound Right		96	263	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	205	662	490
	Eastbound Thru/Right		227	674	
	Westbound Left		143	201	300
	Westbound Thru		248	239	
	Southbound Left/Thru		231	255	
	Southbound Right		235	225	300
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	335	481	
	Eastbound Thru		207	271	
	Westbound Thru		272	295	
	Westbound Right		255	235	
	Northbound Left		526	438	500
	Northbound Left/Thru		585	492	
	Northbound Right		416	308	500

TABLE 18
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	217	235	175
	Eastbound Thru		136	246	
	Eastbound Right		72	132	145
	Westbound Left		86	58	
	Westbound Thru		254	228	
	Westbound Right		164	128	200
	Northbound Left		137	112	
	Northbound Thru/Right		109	65	
	Southbound Left		125	171	225
	Southbound Thru		45	283	
	Southbound Right		105	229	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left	TWSC	46	80	100
	Westbound Left/Thru		16	70	
	Westbound Thru/Right		22	35	
	Northbound Left/Thru/Right		-	54	
	Southbound Left/Thru		24	46	
	Southbound Right		71	77	

1. Worst lane movement (of the approach) value stated.

Year 2045 Alternative 1A Conditions (With Half Rancheria Development)

Year 2045 Alternative 1A conditions are presented in TM# 15 in the Appendix.

Year 2045 Alternative 1A LOS and delays for the existing geometry are presented in **Table 19**.

TABLE 19
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	PM Peak Hour	
				Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	37.6	D
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	18.4	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	29.0	C
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	30.7	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	23.3	C

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 20**.

TABLE 20
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	- 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**
	Eastbound Left	Signal	297	400
	Eastbound Thru		336	
	Eastbound Thru/Right		56	350
	Westbound Left		321	350
	Westbound Thru		425	
	Westbound Right		194	550
	Northbound Left/Thru		267	
	Northbound Right		194	150
	Southbound Left		214	300
	Southbound Left/Thru		298	
	Southbound Right		167	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**
	Eastbound Thru	Signal	188	300
	Eastbound Right		313	350
	Westbound Left		127	300
	Westbound Thru		67	
	Southbound Left		135	300
	Southbound Left/Thru		167	
	Southbound Right		336	300
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**
	Eastbound Left	Signal	338	
	Eastbound Thru		193	
	Westbound Thru		259	
	Westbound Right		171	
	Northbound Left		264	450
	Northbound Left/Thru		311	
	Northbound Right		160	400

TABLE 20
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	- 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**
	Eastbound Left	Signal	227	175
	Eastbound Thru		184	
	Eastbound Right		46	145
	Westbound Left		61	
	Westbound Thru		204	
	Westbound Right		96	200
	Northbound Left		105	
	Northbound Thru/Right		63	
	Southbound Left		175	225
	Southbound Thru		28	
	Southbound Right		172	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**
	Eastbound Left	TWSC	74	110
	Westbound Left/Thru		38	
	Westbound Thru/Right		8	
	Northbound Left/Thru/Right		46	
	Southbound Left/Thru		40	
	Southbound Right		67	

1. Worst lane movement (of the approach) value stated.

Year 2045 Alternative 1B Conditions (With Full Rancheria Development)

Year 2045 Alternative 1B conditions are presented in TM# 15 in the Appendix.

Year 2045 Alternative 1B LOS and delays for the existing geometry are presented in **Table 21**.

TABLE 21
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.4	C	33.7	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	19.8	B	24.0	C
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	49.5	D	52.7	D
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	27.7	C	26.5	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	14.0	B	24.0	C

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 22**.

TABLE 22
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	Year 2045 - 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	213	189	400
	Eastbound Thru		300	368	
	Eastbound Right		116	172	350
	Westbound Left		244	243	275
	Westbound Thru		355	337	
	Westbound Right		131	142	550
	Northbound Left		77	170	200
	Northbound Left/Thru		147	260	
	Northbound Right		113	320	300
	Southbound Left		73	308	400
	Southbound Left/Thru		107	665	
	Southbound Right		108	258	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	143	262	300
	Eastbound Right		51	94	300
	Westbound Left		144	131	300
	Westbound Thru		331	172	
	Southbound Left		123	145	300
	Southbound Left/Thru		119	150	
	Southbound Right		372	382	425
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	282	403	
	Eastbound Thru		157	172	
	Westbound Thru		262	252	
	Westbound Right		263	246	
	Northbound Left		315	452	450
	Northbound Left/Thru		357	519	
	Northbound Right		160	330	400

TABLE 22
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES (CONTINUED)

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	Year 2045 - 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	221	211	175
	Eastbound Thru		128	187	
	Eastbound Right		82	39	145
	Westbound Left		104	55	
	Westbound Thru		285	257	
	Westbound Right		221	103	200
	Northbound Left		165	217	
	Northbound Thru/Right		105	65	
	Southbound Left		141	171	230
	Southbound Thru		58	40	
	Southbound Right		144	274	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left	TWSC	51	80	110
	Westbound Left/Thru		24	66	
	Westbound Thru/Right		96	18	
	Northbound Left/Thru/Right		-	58	
	Southbound Left/Thru		27	42	
	Southbound Right		88	69	

1. Worst lane movement (of the approach) value stated.

Alternative 2, 2A and 2B Conditions Analysis (Diverging Diamond with Traditional Signals)

The Alternative 2's represent a "build" condition that is assumed to be in operation in year 2025. The critical consideration is whether the alternatives will provide acceptable traffic operations after 20-years (year 2045). In order to present data that can be used for a 10-year design life interim phase, year 2035 traffic operations are also considered.

Alternative 2 Condition Analysis

Year 2035 Alternative 2 Conditions (Without Rancheria Development)

Year 2035 Alternative 2 conditions are presented in TM# 11 (Revised) in the Appendix.

Year 2035 Alternative 2 LOS and delays are presented in **Table 23**.

TABLE 23
YEAR 2035 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	32.2	C	22.9	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	11.7	B	12.2	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	10.2	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	21.0	C	18.6	B

Notes:
1 LOS = Delay based on average of all approaches for Roundabout
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2035 critical queues are presented in **Table 24** and **Table 25**.

TABLE 24
YEAR 2035 95TH PERCENTILE AM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) AM Peak Hour[1] Average	Year 2035 Queue (ft) AM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	52.9	244.4	400
	Eastbound Thru/Right		10.3	150.9	
	Westbound Left/Thru/Right		54.5	393.2	550
	Northbound Left/Thru		6.6	86.1	100
	Northbound Right		4.7	85	100
	Southbound Left/Thru/Right		39.0	197.2	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	19.1	208	630
	Westbound Left/Thru		42.2	324.5	500
	Southbound Left		4.7	105.4	450
	Southbound Right		222.0	420.8	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	20.6	353.6	480
	Westbound Thru/Right		45.2	**303**	215
	Northbound Left		7.7	126.2	450
	Northbound Right		176.0	241.9	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	22.7	**238.4**	150
	Eastbound Thru		8.2	145.4	210
	Westbound Left		26.8	127	
	Westbound Thru		21.0	238.9	
	Northbound Left		7.9	147.8	
	Northbound Thru/Right		50.5	237.7	
	Southbound Left/Thru		16.4	105.5	225
	Southbound Right		15.0	238.7	350

1. Worst lane movement (of the approach) value stated.

TABLE 25
YEAR 2035 95TH PERCENTILE PM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) PM Peak Hour[1] Average	Year 2035 Queue (ft) PM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	38.6	285.9	400
	Eastbound Thru/Right		27.8	256.6	
	Westbound Left/Thru/Right		62.1	421.5	550
	Northbound Left/Thru		7.5	86.1	100
	Northbound Right		6.6	85.1	100
	Southbound Left/Thru/Right		115.2	**465.3**	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	69.5	515.5	630
	Westbound Left/Thru		35.7	282.4	500
	Southbound Left		7.5	126.8	450
	Southbound Right		211.0	321.1	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	34.7	367.8	480
	Westbound Thru/Right		40.6	**301.3**	200
	Northbound Left		5.5	106.1	450
	Northbound Right		176.0	224.1	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	29.4	**305.5**	150
	Eastbound Thru		13.2	**253.4**	210
	Westbound Left		20.5	127.5	
	Westbound Thru		7.5	212.7	
	Northbound Left		7.6	128.1	
	Northbound Thru/Right		43.4	104.3	
	Southbound Left/Thru		21.5	151.9	225
	Southbound Right		17.9	280.9	350

1. Worst lane movement (of the approach) value stated.

Year 2045 Alternative 2 Conditions (Without Rancheria Development)

Year 2045 Alternative 2 conditions are presented in TM# 14 in the Appendix.

Year 2045 Alternative 2 LOS and delays for the existing geometry are presented in **Table 26**.

TABLE 26
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	15.8	B	23.9	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B	12.9	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.0	B	10.5	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	21.0	C	19.0	B

Notes:
1 LOS = Delay based on average of all approaches for Roundabout
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 27** and **Table 28**.

TABLE 27
YEAR 2045 95TH PERCENTILE AM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	40.3	291.5	400
	Eastbound Thru/Right		17.7	217.2	
	Westbound Left/Thru/Right		62.4	412.8	550
	Northbound Left/Thru		6.4	86.1	100
	Northbound Right		4.6	85	100
	Southbound Left/Thru/Right		37.9	210.5	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru/Right	Signal	34.5	311.5	630
	Westbound Left/Thru		47.6	331	500
	Southbound Left		5.2	121.5	450
	Southbound Right		212.0	556.6	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left/Thru	Signal	25.1	293.9	480
	Westbound Thru/Right		50.1	318.9	450
	Northbound Left		9.2	141.7	450
	Northbound Right		176.0	224.1	400
4	***S. Bonnyview Rd/Churn Creek Rd***		--	--	--
	Eastbound Left	Signal	30.4	339.9	150
	Eastbound Thru		10.7	228.5	210
	Westbound Left		33.0	126.6	
	Westbound Thru		14.5	286.5	
	Northbound Left		7.4	165.9	
	Northbound Thru/Right		56.4	133.2	
	Southbound Left/Thru		18.9	109.8	225
	Southbound Right		17.0	251.2	350

1. Worst lane movement (of the approach) value stated.

TABLE 28
YEAR 2045 95TH PERCENTILE PM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	45.5	376.9	400
	Eastbound Thru/Right		30.4	255.6	
	Westbound Left/Thru/Right		71.0	444.3	550
	Northbound Left/Thru		7.9	86.1	100
	Northbound Right		8.2	85.1	100
	Southbound Left/Thru/Right		161.8	480.9	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	86.3	587.1	630
	Westbound Left/Thru		39.9	343.5	500
	Southbound Left		8.0	129.7	450
	Southbound Right		213.0	468.2	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	40.5	493.9	480
	Westbound Thru/Right		47.9	307.3	450
	Northbound Left		6.5	118.5	450
	Northbound Right		18.3	156	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	32.8	298	150
	Eastbound Thru		16.6	285	210
	Westbound Left		22.9	126.3	
	Westbound Thru		5.7	248.8	
	Northbound Left		7.9	128.2	
	Northbound Thru/Right		50.6	99.7	
	Southbound Left/Thru		22.7	148.7	225
	Southbound Right		22.2	289.5	350

1. Worst lane movement (of the approach) value stated.

Year 2045 Alternative 2A Conditions (With Half Rancheria Development)

Year 2045 Alternative 2A conditions are presented in TM# 15 in the Appendix.

Year 2045 Alternative 2A LOS and delays for the existing geometry are presented in **Table 29**.

TABLE 29
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	PM Peak Hour	
				Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.4	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.5	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	20.0	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 30**.

TABLE 30
YEAR 2045 95TH PERCENTILE PM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	55.8	265.9	400
	Eastbound Thru/Right		60.4	289.1	
	Westbound Left/Thru/Right		164.3	416.8	550
	Northbound Left/Thru		19.8	142.9	100
	Northbound Right		8.9	214.5	100
	Southbound Left/Thru		75.0	379.4	300
	Southbound Right		27.8	286.6	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	76.8	447	630
	Westbound Left/Thru		49.2	321.2	500
	Southbound Left		5.0	102.2	450
	Southbound Right		57.3	607.4	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	37.3	411.1	480
	Westbound Thru/Right		48.5	292.4	450
	Northbound Left		9.8	127.4	450
	Northbound Right		19.3	223.8	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	35.6	237.2	150
	Eastbound Thru		18.8	231.9	210
	Westbound Left		9.1	102.9	
	Westbound Thru		54.9	232.6	
	Northbound Left		30.0	126.1	
	Northbound Thru/Right		6.3	62.7	
	Southbound Left/Thru		23.4	168.4	225
	Southbound Right		26.2	286.2	350

1. Worst lane movement (of the approach) value stated.

Year 2045 Alternative 2B Conditions (With Full Rancheria Development)

Year 2045 Alternative 2B conditions are presented in TM# 15 in the Appendix.

Year 2045 Alternative 2B LOS and delays for the existing geometry are presented in **Table 31**.

TABLE 31
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	20.5	C	27.5	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	16.3	B	14.8	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	10.7	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	23.0	C	20.3	C

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 32** and **33**.

TABLE 32
YEAR 2045 95TH PERCENTILE AM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	50.3	268.4	400
	Eastbound Thru/Right		57.5	347.5	
	Westbound Left		36.8	211.0	550
	Westbound Thru		51.9	370.9	550
	Westbound Right		5.8	206.5	550
	Northbound Left/Thru		26.3	150.4	100
	Northbound Right		23.5	205.8	100
	Southbound Left/Thru/Right		26.7	118.9	300
	Southbound Right		17.8	214.7	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	43.6	307.7	630
	Westbound Left/Thru		161.3	620.7	500
	Southbound Left		5.4	86.7	450
	Southbound Right		41.2	360.7	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	25.1	317.2	480
	Westbound Thru/Right		68.9	301.6	450
	Northbound Left		23	187.9	450
	Northbound Right		24.2	224.1	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	34.5	225.5	150
	Eastbound Thru		10.4	127.4	210
	Westbound Left		41.1	132.6	
	Westbound Thru		15.7	124.8	
	Northbound Left		10.7	86.3	
	Northbound Thru/Right		61.5	303.0	
	Southbound Left/Thru		22.6	106.6	225
	Southbound Right		22.5	204.0	350

1. Worst lane movement (of the approach) value stated.

TABLE 33
YEAR 2045 95TH PERCENTILE PM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	57.9	287.8	400
	Eastbound Thru/Right		99.8	426.1	
	Westbound Left		52.9	296.2	550
	Westbound Thru		68.2	361.1	550
	Westbound Right		9.4	276.9	550
	Northbound Left/Thru		60.2	294.7	100
	Northbound Right		50.1	363.7	100
	Southbound Left/Thru/Right		82.9	461.9	300
	Southbound Right		31.7	361.4	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	108.5	562.1	630
	Westbound Left/Thru		82.0	533.0	500
	Southbound Left		8.1	120.3	450
	Southbound Right		29.7	296.4	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	47.8	539.1	480
	Westbound Thru/Right		55.6	331.1	450
	Northbound Left		13.3	147.9	450
	Northbound Right		19.7	223.9	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	37.5	263.4	150
	Eastbound Thru		15.4	228.0	210
	Westbound Left		9.8	102.5	
	Westbound Thru		56.7	220.3	
	Northbound Left		28.4	108.1	
	Northbound Thru/Right		6.3	62.7	
	Southbound Left/Thru		23.5	168.1	225
	Southbound Right		28.0	287.5	350

1. Worst lane movement (of the approach) value stated.

Alternative 4, 4A and 4B Conditions Analysis (Diverging Diamond with Traditional Signals)

The Alternative 4's represent a "build" condition that is assumed to be in operation in year 2025. The critical consideration is whether the alternatives will provide acceptable traffic operations after 20-years (year 2045). In order to present data that can be used for a 10-year design life interim phase, year 2035 traffic operations are also considered.

Alternative 4 Condition Analysis

Year 2035 Alternative 4 Conditions (Without Rancheria Development)

Year 2035 Alternative 4 conditions are presented in TM# 11 in the Appendix.

Year 2035 Alternative 4 LOS and delays for the existing geometry are presented in **Table 34**.

TABLE 34
YEAR 2035 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	12.2	B	26.3	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	11.7	B	12.2	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	10.2	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	10.3	B	11.4	B

Notes:
1 LOS = Delay based on average of all approaches for Roundabout
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 35** and **Table 36**.

TABLE 35
YEAR 2035 95TH PERCENTILE AM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) AM Peak Hour[1] Average	Year 2035 Queue (ft) AM Peak Hour[1] Max[2]	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		129.5	
	Eastbound Thru/Right			128.5	
	Westbound Left/Thru			221.8	
	Westbound Thru/Right			226	
	Northbound Left/Thru/Right			16.8	
	Southbound Left			20.8	
	Southbound Left/Thru			20.8	
	Southbound Right			33.7	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	14.5	127.1	630
	Westbound Left/Thru		50.1	283.3	500
	Southbound Left		3.9	83.8	450
	Southbound Right		31.2	396.5	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	31.6	200	480
	Westbound Thru/Right		24.7	**280.9**	215
	Northbound Left		10.7	140.4	450
	Northbound Right		2.4	151.3	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		77.1	
	Eastbound Thru/Right			79.7	
	Westbound Left/Thru			114.9	
	Westbound Thru/Right			122.5	
	Northbound Left/Thru/Right			61	
	Southbound Left/Thru			32.7	
	Southbound Right			111.1	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

TABLE 36
YEAR 2035 95TH PERCENTILE PM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) PM Peak Hour[1] Average	Year 2035 Queue (ft) PM Peak Hour[1] Max[2]	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		465	
	Eastbound Thru/Right			500.2	
	Westbound Left/Thru			185.6	
	Westbound Thru/Right			183.2	
	Northbound Left/Thru/Right			36.2	
	Southbound Left			88.7	
	Southbound Left/Thru			101.2	
	Southbound Right			104.2	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	21.6	154.3	630
	Westbound Left/Thru		46.6	277.8	500
	Southbound Left		6.4	103.4	450
	Southbound Right		25.3	313.3	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	59.7	315.4	480
	Westbound Thru/Right		25.6	**340.6**	215
	Northbound Left		7.5	141.2	450
	Northbound Right		5.9	193.1	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		113.1	
	Eastbound Thru/Right			118	
	Westbound Left/Thru			95	
	Westbound Thru/Right			99.9	
	Northbound Left/Thru/Right			46.1	
	Southbound Left/Thru			47.1	
	Southbound Right			156.7	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Year 2045 Alternative 4 Conditions (Without Rancheria Development)

Year 2045 Alternative 4 conditions are presented in TM# 14 in the Appendix.

Year 2045 Alternative 4 LOS and delays for the existing geometry are presented in **Table 37**.

TABLE 37
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	11.8	B	23.6	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	11.8	B	11.9	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	12.0	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	11.3	B	12.2	B

Notes:
1 LOS = Delay based on average of all approaches for Roundabout
3. Warrant = Based on California MUTCD Warrant 3
4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 38** and **Table 39**.

TABLE 38
YEAR 2045 95TH PERCENTILE AM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		113.9	
	Eastbound Thru/Right			112.8	
	Westbound Left/Thru			237.5	
	Westbound Thru/Right			242	
	Northbound Left/Thru/Right			16	
	Southbound Left			22.2	
	Southbound Left/Thru			22.2	
	Southbound Right			35.7	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	17.8	155	630
	Westbound Left/Thru		53.8	261.6	500
	Southbound Left		4.3	84	450
	Southbound Right		61.4	538.7	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	48.3	213.9	480
	Westbound Thru/Right		27.9	340.4	215
	Northbound Left		62.2	402.5	450
	Northbound Right		10.1	168.8	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		89.2	250
	Eastbound Thru/Right			93.1	250
	Westbound Left/Thru			147.3	
	Westbound Thru/Right			162.4	
	Northbound Left/Thru/Right			65.7	150
	Southbound Left/Thru			40.3	
	Southbound Right			117.7	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

TABLE 39
YEAR 2045 95TH PERCENTILE PM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		379.2	
	Eastbound Thru/Right			420.3	
	Westbound Left/Thru			195	
	Westbound Thru/Right			195	
	Northbound Left/Thru/Right			45.4	
	Southbound Left			95.8	
	Southbound Left/Thru			113.1	
	Southbound Right			114.8	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	25.1	171	630
	Westbound Left/Thru		49.3	252	500
	Southbound Left		6.7	108	450
	Southbound Right		30.6	451	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	69.8	358.2	480
	Westbound Thru/Right		29.4	300	215
	Northbound Left		21.3	285.6	450
	Northbound Right		6.6	188.5	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		119.4	250
	Eastbound Thru/Right			125.5	250
	Westbound Left/Thru			110.4	
	Westbound Thru/Right			118	
	Northbound Left/Thru/Right			45	150
	Southbound Left/Thru			52.9	
	Southbound Right			183.4	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Year 2045 Alternative 4A Conditions (With Half Rancheria Development)

Year 2045 Alternative 4A conditions are presented in TM# 15 in the Appendix.

Year 2045 Alternative 4A LOS and delays for the existing geometry are presented in **Table 40**.

TABLE 40
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	PM Peak Hour	
				Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	20.1	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	12.9	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	12.4	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 41**.

TABLE 41
YEAR 2045 95TH PERCENTILE VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		144.3	
	Eastbound Thru			144.3	
	Eastbound Thru/Right			173.3	
	Westbound Left/Thru			320.5	
	Westbound Thru/Right			323.3	
	Northbound Left/Thru			33.4	
	Northbound Right			55.9	
	Southbound Left			149.6	
	Southbound Left/Thru			190.4	
	Southbound Right			195.7	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	33.2	206.6	630
	Westbound Left/Thru		57.9	240.7	500
	Southbound Left		6.0	82.6	450
	Southbound Right		88.5	541.7	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	84.4	368.9	480
	Westbound Thru/Right		32.3	295.9	215
	Northbound Left		59.5	510.7	450
	Northbound Right		9.3	218.4	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		120.8	250
	Eastbound Thru/Right			127	250
	Westbound Left/Thru			113.7	
	Westbound Thru/Right			121.7	
	Northbound Left/Thru/Right			45.4	150
	Southbound Left/Thru			53.6	
	Southbound Right			187	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Year 2045 Alternative 4B Conditions (With Full Rancheria Development)

Year 2045 Alternative 4B conditions are presented in TM# 15 in the Appendix.

Year 2045 Alternative 4B LOS and delays for the existing geometry are presented in **Table 42**.

TABLE 42
YEAR 2045 INTERSECTION LOS AND DELAYS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	11.2	B	26.5	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	12.3	B	14.8	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.7	B	10.7	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	11.6	B	12.6	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 critical queues are presented in **Table 43** and **44**.

TABLE 43
YEAR 2045 95TH PERCENTILE AM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		81.9	
	Eastbound Thru			81.9	
	Eastbound Thru/Right			87.8	
	Westbound Left/Thru			237.1	
	Westbound Thru/Right			247	
	Westbound Right			78.4	
	Northbound Left/Thru			21.8	
	Northbound Right			32.3	
	Southbound Left			31.3	
	Southbound Left/Thru			31.3	
	Southbound Right			46.6	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	21.0	151.5	630
	Westbound Left/Thru		70.0	332.7	500
	Southbound Left		11.5	153.0	450
	Southbound Right		56.7	533.9	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	56.6	270.5	480
	Westbound Thru/Right		31.6	281.4	215
	Northbound Left		20.7	167.4	450
	Northbound Right		9.8	235.2	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		90.4	250
	Eastbound Thru/Right			94.4	250
	Westbound Left/Thru			154.1	
	Westbound Thru/Right			170.4	
	Northbound Left/Thru/Right			66.3	150
	Southbound Left/Thru			41.3	
	Southbound Right			120.8	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

TABLE 44
YEAR 2045 95TH PERCENTILE PM VEHICLE QUEUES

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		264.5	
	Eastbound Thru			264.5	
	Eastbound Thru/Right			353	
	Westbound Left/Thru			234.5	
	Westbound Thru/Right			241.1	
	Westbound Right			101.1	
	Northbound Left/Thru			58.6	
	Northbound Right			150	
	Southbound Left			161	
	Southbound Left/Thru			216.3	
	Southbound Right			221.9	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	38.5	272.9	630
	Westbound Left/Thru		68.8	334.4	500
	Southbound Left		18.9	218.8	450
	Southbound Right		42.2	506.4	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	81.1	349.9	480
	Westbound Thru/Right		33.9	282.6	215
	Northbound Left		17.1	149.0	450
	Northbound Right		8.3	170.3	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		122.1	250
	Eastbound Thru/Right			128.4	250
	Westbound Left/Thru			116.8	
	Westbound Thru/Right			125.3	
	Northbound Left/Thru/Right			45.8	150
	Southbound Left/Thru			54.3	
	Southbound Right			190.5	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Appendices

Appendix A: Technical Memorandums

Technical Memorandum No. 1

To:	City of Redding - Engineering	**Date:**	May 06, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham		
Re:	Proposed Approach to Traffic Volume Projections	**Job No.:**	45-5721-27
		File No.:	C2174MEM001
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Based on input received at the May 6, 2016 mini-PDT meeting, Omni-Means will develop future year traffic volumes based on the following guidelines:

Year 2045 (Design Year)

Considerations

1. The Shasta County Regional Travel Demand Model (Model) can provide projections to year 2035.
2. Omni-Means has already adjusted the Model to provide 2035 volumes for the study area via. the March 2016 Traffic Impact Analysis Report (TIAR) prepared for the California Gold project on Churn Creek Road.
3. A BoxCo development should be considered for the NW quadrant of the I/C.
4. An AM/PM and coffee shop should be considered for the SE quadrant of the I/C.
5. The California Gold development should be assumed as constructed per the Use Permit application to the City.
6. If BoxCo gets developed at this location, the remaining developable land in the immediate interchange area will be more likely to develop.

Approach

1. Prepare the following for mini-PDT approval:
   1) Un-adjusted Model TAZ info for greater area. Include development assumptions and linkages.
   2) Present proposed linkage modifications (i.e. No driveways from Rother property to S. Bonnyview).
   3) Present proposed development assumption changes.
   4) Present methodology for customization of development assumptions that will be needed to better match proposed developments (eg. BoxCo).
2. Add full development of California Gold project in appropriate TAZ.

3. Add full development of a 160ksf BoxCo with 16 fueling positions (on the 2 Rother parcels (15 +/- acres)).
4. Add 5 acres of general retail development on the Redding Business Trust parcel (north of Rother and south of swale). Assume approximately 60ksf of retail containing 1 fast food with drivethru.
5. Add Pre-Application proposed development in SE quadrant of the I/C.
6. Add Phase II Blue Shield (and double check that unfinished office building that overlooks the river is included as developed).
7. Technical Parameters:
   - Use the Model for trip assignments after making the above modifications.
   - Perform reality check of Model trip assignments.

Year 2025 (Phase I I/C Construction Complete)

Approach

1. Straight line to derive 2025.
2. Add 80% development of California Gold project.
3. Add full development of a 160ksf BoxCo with 16 fueling positions (on the 2 Rother parcels (15 +/- acres)).
4. Add 50% of general retail development on the Redding Business Trust parcel.
5. Add Pre-Application proposed development in SE quadrant.
6. Do NOT add phase II Blue Shield.
7. Technical Parameters:
   - Use the Model.
   - Perform reality check of Model trip assignments.

Year 2035 (Phase II I/C Construction Complete)

Approach

1. Straight line between 2025 and 2045.

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ENGINEERING SOLUTIONS

Technical Memorandum No. 2

To:	City of Redding - Engineering	**Date:**	May 18, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham		
Re:	Proposed Approach to Traffic Volume Projections	**Job No.:**	45-5721-27
		File No.:	C2174MEM002
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Based on input received at the May 18, 2016 mini-PDT meeting, Omni-Means will develop future year traffic volumes based on the following guidelines:

Historic Traffic Growth at Interchange

1. See **Attachment A.** Approx. 1.5% annual growth through 2013.

Review 2015 & 2035 "Base Line" Volumes

1. "Base Line" 2015 and 2035 volumes per the March 2016 S. Bonnyview / Churn Creek Retail Center TIAR, Omni-Means. Refer to **Attachment B.** Travel Demand Model shows 1.0% - 1.2% annual growth rate through 2035 (Note: The 2035 #'s and growth rate assume the S. Bonnyview / churn Creek Retail parcels are VACANT... which accounts for the low annual growth rate reflected on Attachment B).

Proposed 2035 & 2045 Travel Demand Model Adjustments

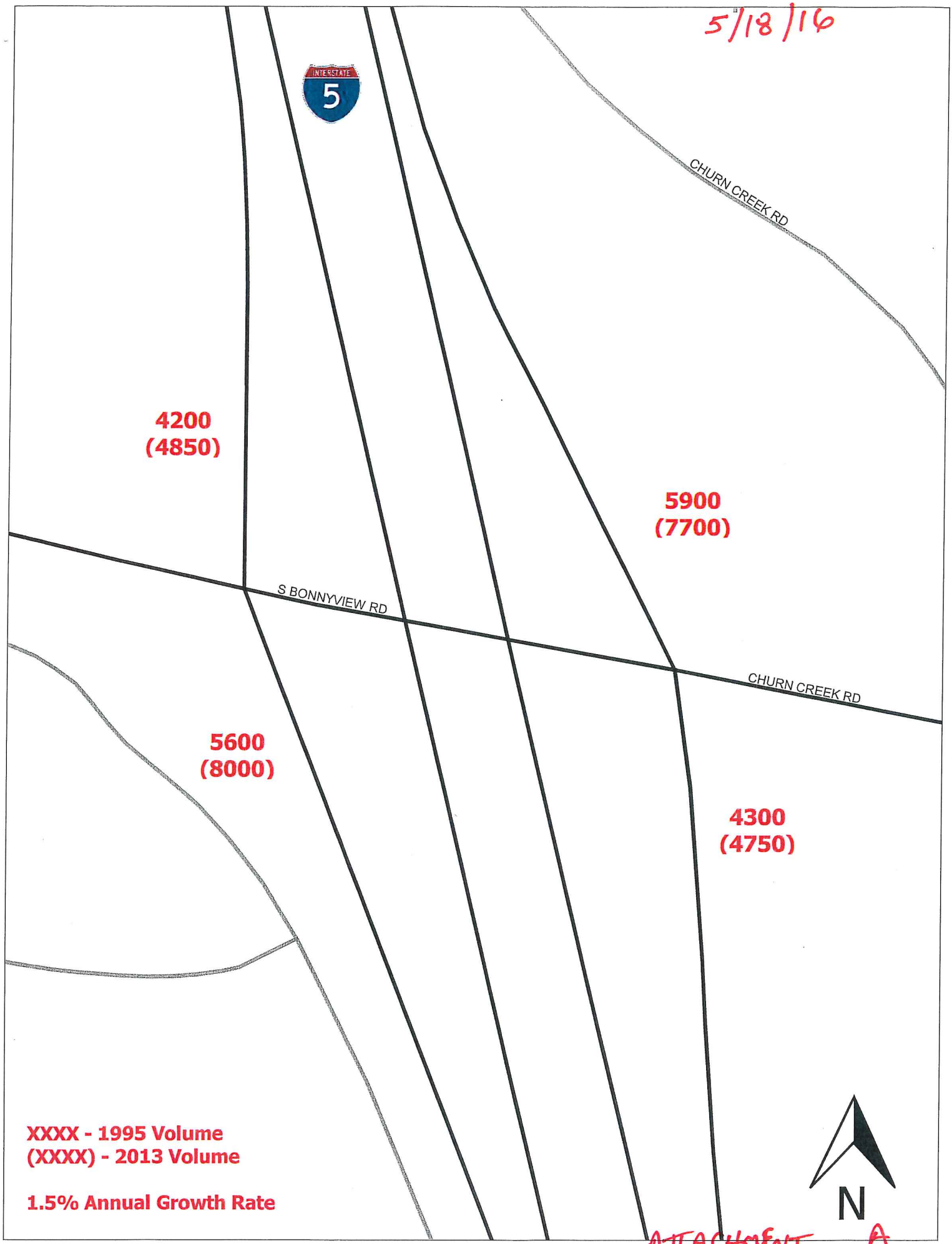
Refer to **Attachment C** for the following cross-references:

1) Stay with model assumptions with straight-line DU's to 2045.
2) Stay with model assumptions with straight-line DU's to 2045.
3) No new development.
4) For DU's, increase 2035 as shown and straight-line to 2045. Assumes approx. 12 acres of 3 units per acre out to 2045.
5) See **Attachment D** for Blue Shield. The existing employees are captured in another TAZ in the model. Assume double in size by 2035 and flat to 2045 (i.e. add 400 employees).

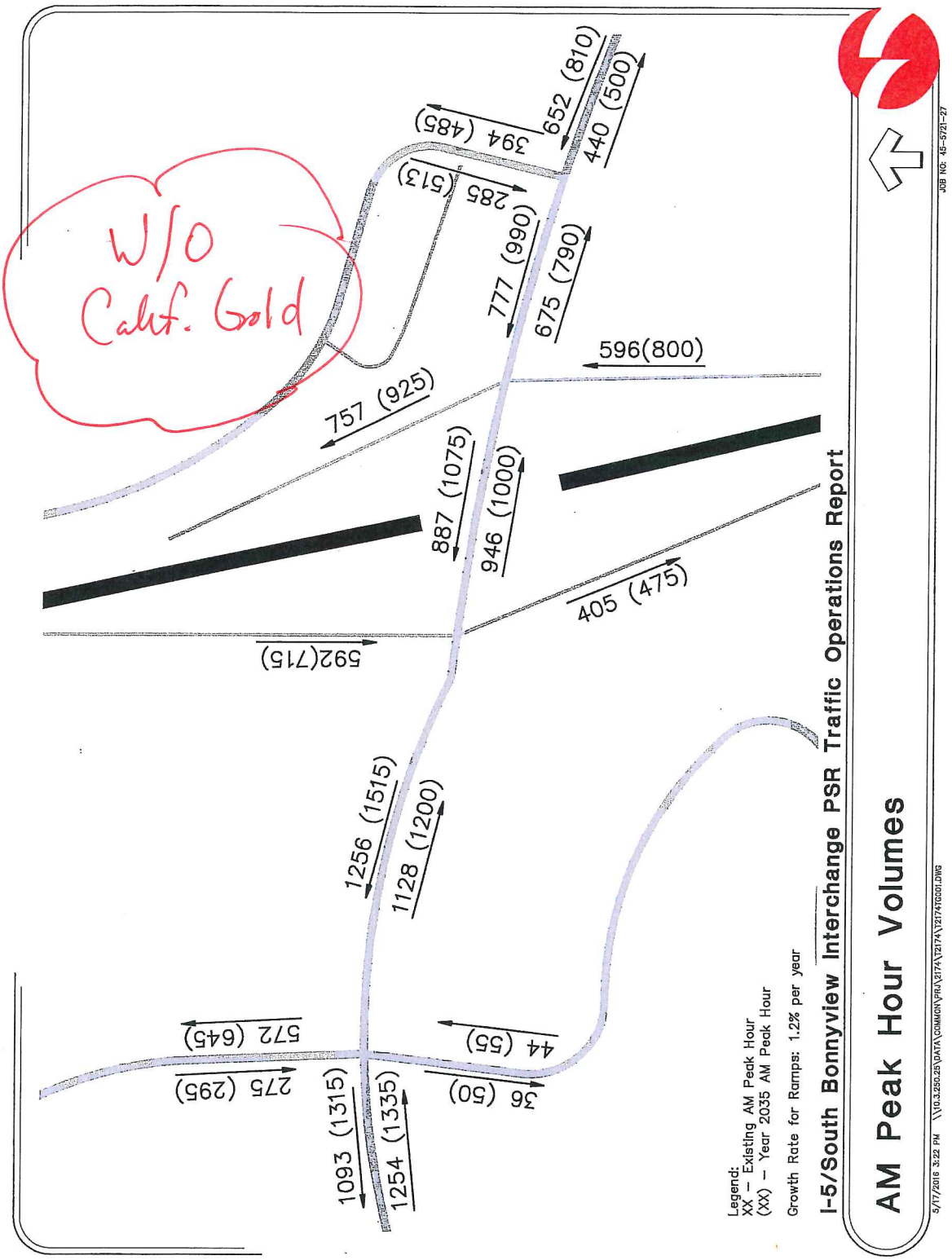
6) Create new TAZ and assume 27 additional DU's in 2035 and flat to 2045. Represents SF development north of the creek.
7) 2035 and 2045 employee counts are placeholders. EMP #'s will be manually adjusted to reflect development assumptions documented in Tech. Memo. No. 1. See **Attachment F** for Tech. Memo. No. 1.
8) Add employees for 2035 and 2045 based on the assumption of office occupancy of the partially completed building overlooking the river.
9) See note on Attachment.
10) See note on Attachment.
11) See note on Attachment.
12) Use model assumptions for 2035. Assume build out of the retail center for 2045. See note on Attachment.
13) Stay with model assumptions for 2035 and straight-line DU's to 2045.
14) Stay with model assumptions for 2035 and no increase for 2045 (2035 is most likely overstated as is).
15) Stay with model assumptions for 2035 and no increase for 2045 since the 2035 DU number is already full build out.
16) Corrections to more accurately reflect existing and the historical pace of development are proposed. See Attachment E.

Next Steps - Derive 2025, 2035 & 2045 Volumes

1. Make all the model adjustments described above.
2. Run the model.
3. Reality checks and adjustments.
4. Available for next mini-PDT meeting.

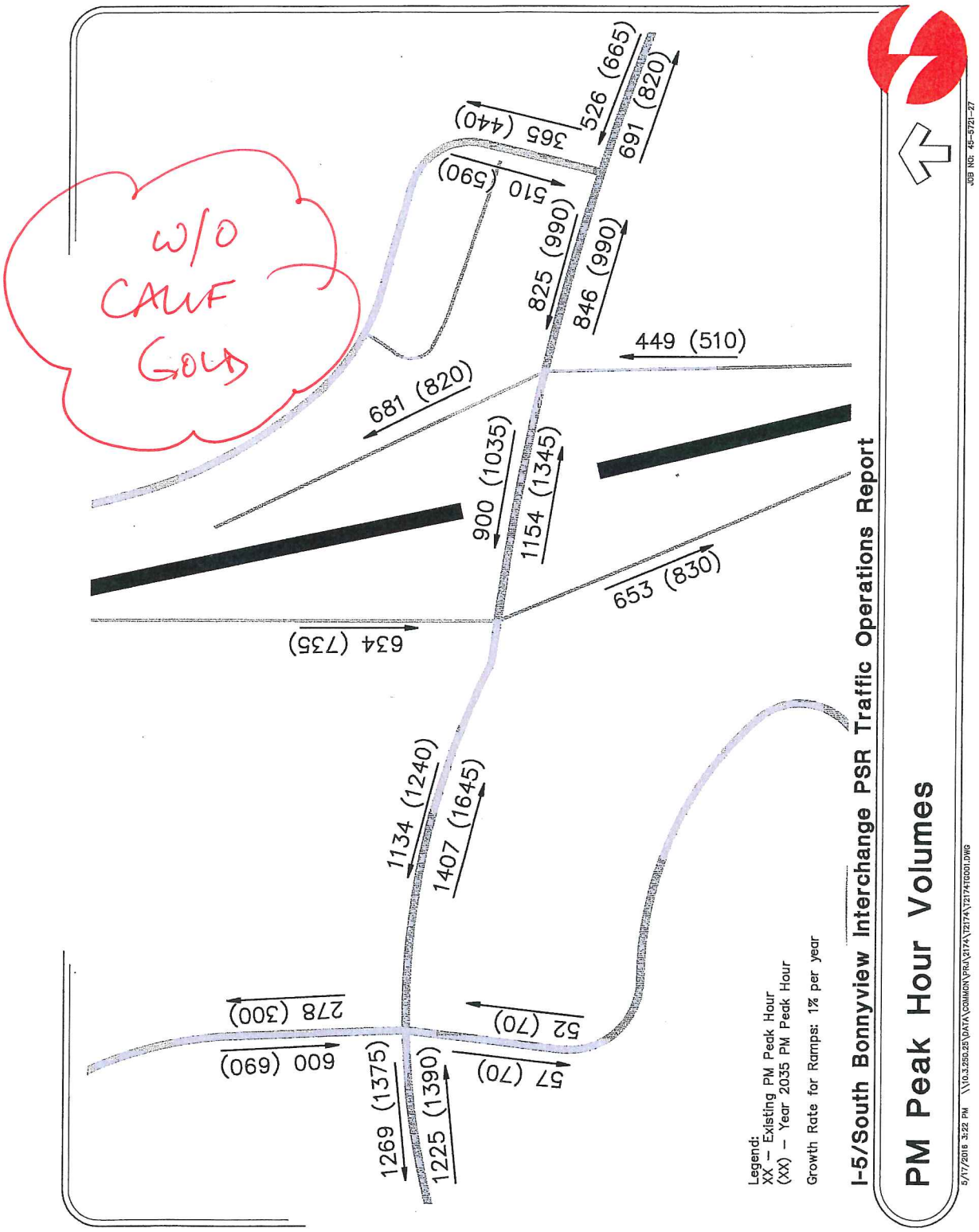

5/18/16
INTERSTATE
5
CHURN CREEK RD
4200
(4850)
5900
(7700)
S BONNYVIEW RD
CHURN CREEK RD
5600
(8000)
4300
(4750)
XXXX - 1995 Volume
(XXXX) - 2013 Volume
1.5% Annual Growth Rate
N
ATTACHMENT A

5/18/16



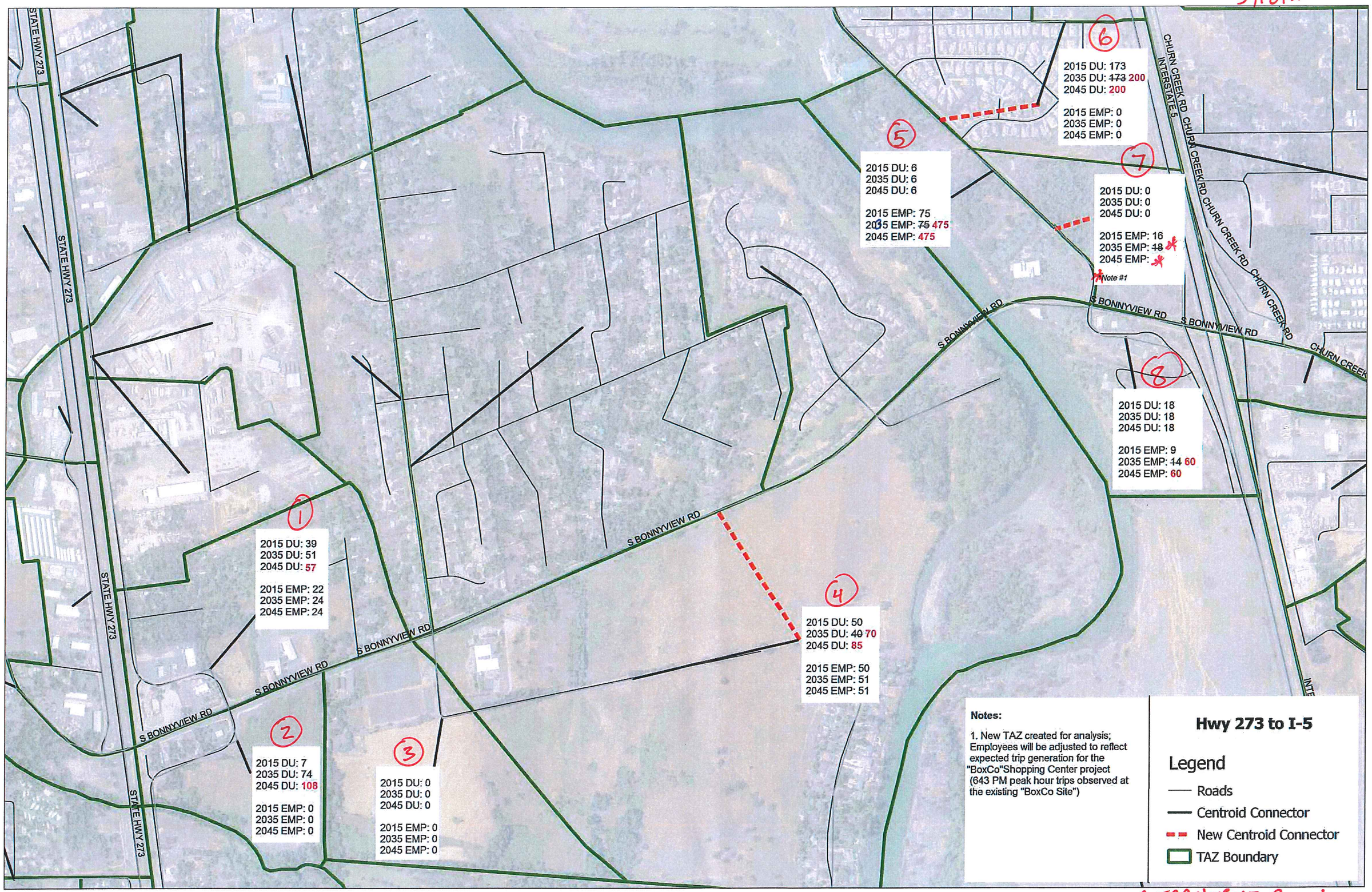
ATTACHMENT B-1

5/18/16



ATTACHMENT B-2

5/18/16



ATTACHMENT C - 1

5/18/16

*TAZ above has 926 DU (2015) and 962 DU (2035)

11

10

2015 DU: 0
2035 DU: 374
2045 DU: 374

2015 EMP: 154
2035 EMP: ~~298~~ *
2045 EMP: *

*Note #2

12

2015 DU: 563
2035 DU: 564
2045 DU: 563

2015 EMP: 29
2035 EMP: 35
2035 EMP: *

*Note #4

13

2015 DU: 16
2035 DU: 38
2045 DU: 50

2015 EMP: 24
2035 EMP: 26
2045 EMP: 26

16

Stillwater Business Park:
(east of Airport Road)

2015 DU: 13
2035 DU: 13
2045 DU: 19

2015 EMP: ~~331~~ 0
2035 EMP: ~~298~~ 200
2045 EMP: 331

9

2015 DU: 0
2035 DU: 0
2045 DU: 0

2015 EMP: 0
2035 EMP: ~~7~~ *
2045 EMP: *

*Note #3

14

2015 DU: 221
2035 DU: 718
2045 DU: 718

2015 EMP: 13
2035 EMP: 13
2045 EMP: 13

15

2015 DU: 84
2035 DU: 436
2045 DU: 436

2015 EMP: 5
2035 EMP: 57
2045 EMP: 57

BONNYVIEW RD
CHURN CREEK RD
CHURN CREEK RD CHURN CREEK RD
CHURN CREEK RD
CHURN CREEK RD
CHURN CREEK RD
CHURN CREEK RD
CHURN CREEK RD
RANCHO RD RANCHO RD RANCHO RD RANCHO RD RANCHO RD RANCHO RD RANCHO RD
RANCHO RD RANCHO RD RANCHO RD RANCHO RD RANCHO
SHASTA VIEW DR
SHASTA VIEW DR
SHASTA VIEW DR
SHASTA VIEW DR
GOODWATER AVE
GOODWATER AVE
GOODWATER AVE
AIRPORT RD
AIRPORT RD
AIRPORT RD
AIRPORT RD
AIRPORT RD
AIRPORT RD
SHASTA VIEW DR
INTERS

I-5 to Airport Road

Legend

- Roads
- Centroid Connector
- New Centroid Connector
- TAZ Boundary

Notes:

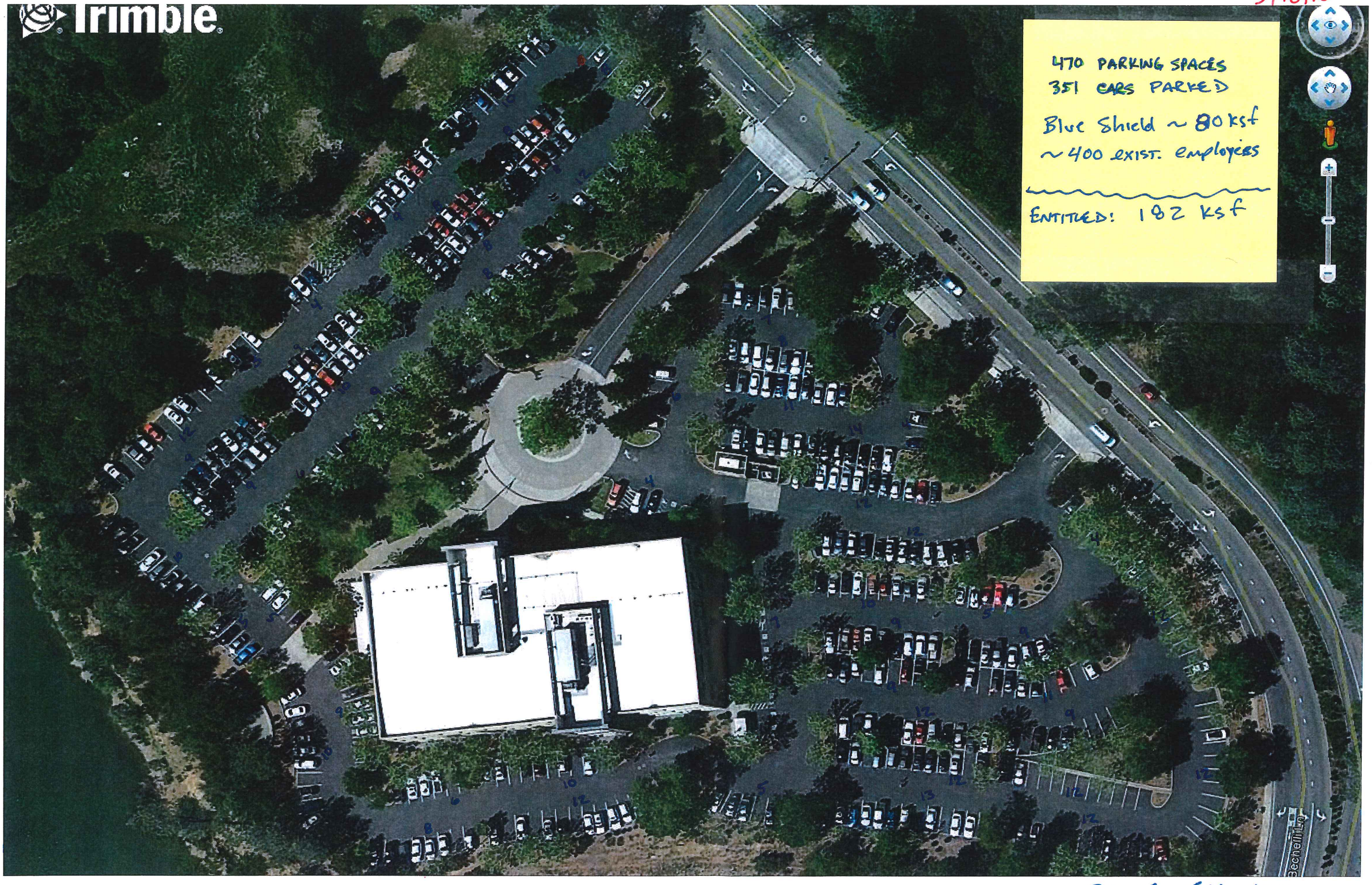
2. Employees will be adjusted to reflect expected trip generation for the S. Bonnyview/Churn Creek retail project (323 AM and 493 PM peak hour trips from the traffic study)

3. Employees will be adjusted to reflect expected trip generation for The Terraces retail project (142 AM and 138 PM peak hour trips)

4. Employees will be adjusted to reflect expected trip generation for the Shasta View retail project (149 AM and 392 PM peak hour trips)

ATTACHMENT C-2

5/18/16



BLUE SHIELD

ATTACHMENT D

5/18/16

Russ Wenham - TAZ

From: Makinzie Clark
To: Wenham, Russ
Date: 5/17/2016 9:58 AM
Subject: TAZ



ATTACHMENT E

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ENGINEERING SOLUTIONS

Technical Memorandum No. 1

To:	City of Redding - Engineering	**Date:**	May 06, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham		
Re:	Proposed Approach to Traffic Volume Projections	**Job No.:**	45-5721-27
		File No.:	C2174MEM001
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Based on input received at the May 6, 2016 mini-PDT meeting, Omni-Means will develop future year traffic volumes based on the following guidelines:

Year 2045 (Design Year)

Considerations

1. The Shasta County Regional Travel Demand Model (Model) can provide projections to year 2035.
2. Omni-Means has already adjusted the Model to provide 2035 volumes for the study area via. the March 2016 Traffic Impact Analysis Report (TIAR) prepared for the California Gold project on Churn Creek Road.
3. A BoxCo development should be considered for the NW quadrant of the I/C.
4. An AM/PM and coffee shop should be considered for the SE quadrant of the I/C.
5. The California Gold development should be assumed as constructed per the Use Permit application to the City.
6. If BoxCo gets developed at this location, the remaining developable land in the immediate interchange area will be more likely to develop.

Approach

1. Prepare the following for mini-PDT approval:
   1) Un-adjusted Model TAZ info for greater area. Include development assumptions and linkages.
   2) Present proposed linkage modifications (i.e. No driveways from Rother property to S. Bonnyview).
   3) Present proposed development assumption changes.
   4) Present methodology for customization of development assumptions that will be needed to better match proposed developments (eg. BoxCo).
2. Add full development of California Gold project in appropriate TAZ.

ATTACHMENT F-1

3. Add full development of a 160ksf BoxCo with 16 fueling positions (on the 2 Rother parcels (15 +/- acres)).
4. Add 5 acres of general retail development on the Redding Business Trust parcel (north of Rother and south of swale). Assume approximately 60ksf of retail containing 1 fast food with drivethru.
5. Add Pre-Application proposed development in SE quadrant of the I/C.
6. Add Phase II Blue Shield (and double check that unfinished office building that overlooks the river is included as developed).
7. Technical Parameters:
   - Use the Model for trip assignments after making the above modifications.
   - Perform reality check of Model trip assignments.

Year 2025 (Phase I I/C Construction Complete)

Approach

1. Straight line to derive 2025.
2. Add 80% development of California Gold project.
3. Add full development of a 160ksf BoxCo with 16 fueling positions (on the 2 Rother parcels (15 +/- acres)).
4. Add 50% of general retail development on the Redding Business Trust parcel.
5. Add Pre-Application proposed development in SE quadrant.
6. Do NOT add phase II Blue Shield.
7. Technical Parameters:
   - Use the Model.
   - Perform reality check of Model trip assignments.

Year 2035 (Phase II I/C Construction Complete)

Approach

1. Straight line between 2025 and 2045.

ATTACHMENT F-2

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ENGINEERS · PLANNERS

TECHNICAL MEMORANDUM

To:	City of Redding, Public Works Department	**Date:**	July 7, 2013
Attn:	Mr. Chuck Aukland, PE	**Project:**	City of Redding Traffic Engineering
From:	Russ Wenham, PE, TE, PTOE		
Re:	**Costco Shopping Center (City of Redding) Trip Generation**	**Job No.:**	45-5721-22
		File No.:	C1703MEM003.DOCX
CC:			

INTRODUCTION

The City of Redding retained OMNI-MEANS to gather traffic generation data for the existing Costco Shopping Center (shopping center) in the City of Redding. The shopping center is located at 1300 Dana Drive.

EXISTING SHOPPING CENTER

The 123,000 square feet (123 ksf) shopping center was constructed in 1990 and includes the following services: Tire Center, Pharmacy, Vision Center, Restaurant, Appliances, Household Items, Clothing, Electronics, Food, Furniture, Hardware, Health & Beauty, Jewelry, Office Products, Lawn & Garden, Pet Supplies and Sporting Goods. The shopping center does not have a vehicle fueling station as is typical for many newer Costco's.

EXISTING TRIP GENERATION

The shopping center is accessed by one driveway to Friendly Road and one driveway to Old Alturas Road. Entering and exiting vehicles were manually counted as follows:

- Weekday (4pm to 6pm):
  - Friendly Road Driveway: Tuesday, March 5, 2013 and Wednesday, March 13, 2013.
  - Old Alturas Road Driveway: Wednesday, March 6, 2013 and Thursday, March 14, 2013.
- Saturday (11am to 2pm):
  - Friendly Road Driveway: March 9, 2013 and March 16, 2013.
  - Old Alturas Road Driveway: March 9, 2013 and March 16, 2013.

As summarized in **Table 1 and Table 2**, the following data was recorded or derived:

- Weekday PM Peak Hour:
  - The average peak hour volume was 643 vehicles with 49% entering and 51% exiting.
  - The peak hour was from 4:30pm to 5:30pm.
  - The peak hour volume was 4% higher on the 2nd day of counts than on the 1st day of counts.

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ATTACH. F-1

TABLE 1
REDDING COSTCO - 1300 Dana Drive, Redding, CA
Trip Generation Data Summary - WEEKDAY PM PEAK

PM Period	Tues, 3/5/13 Friendly Road Driveway			Wed, 3/13/13 Friendly Road Driveway			Wed, 3/6/13 Old Alturas Rd Driveway			Thurs, 3/14/13 Old Alturas Rd Driveway			Weekday PM Peak Hour for Entire Development			
	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Peak Hour
4:00-4:15	43	71	114	37	45	82	26	19	45	32	21	53	69	78	147	
4:15-4:30	55	65	120	50	39	89	39	18	57	29	20	49	87	71	158	
4:30-4:45	48	53	101	60	63	123	26	24	50	40	31	71	87	86	173	
4:45-5:00	53	59	112	50	55	105	27	22	49	17	27	44	74	82	155	
5:00-5:15	40	60	100	52	62	114	17	21	38	31	28	59	70	86	156	643
5:15-5:30	51	59	110	58	53	111	30	21	51	29	18	47	84	76	160	
5:30-5:45	37	51	88	42	57	99	25	16	41	26	23	49	65	74	139	
5:45-6:00	32	45	77	57	50	107	14	33	47	27	15	42	65	72	137	
Totals	359	463	822	406	424	830	204	174	378	231	183	414	600	622	1222	
Peak Hour:	199	248	447	220	233	453	118	83	201	117	106	223	315	328	643	
PHF:			0.93			0.92			0.88			0.79			0.93	

Peak Hr. Variations: 1% @ Friendly Road Driveway.
10% @ Old Alturas Drieway.
4% Day-to-Day Variance.

Notes:
xxx *Denotes Peak Hour.*

- Saturday Peak Hour:
  - The average peak hour volume was 798 vehicles with 53% entering and 47% exiting.
  - The peak hour was from 12:45pm to 1:45pm.
  - The peak hour volume was 23% higher on the 2nd day of counts than on the 1st day of counts.

TABLE 2
REDDING COSTCO - 1300 Dana Drive, Redding, CA
Trip Generation Data Summary - SATURDAY

PM Period	Sat, 3/9/13 Friendly Road Driveway			Sat, 3/16/13 Friendly Road Driveway			Sat, 3/9/13 Old Alturas Rd Driveway			Sat, 3/16/13 Old Alturas Rd Driveway			Saturday Peak Hour for Entire Development			
	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Entering Vehicles	Exiting Vehicles	Total Vehicles	Peak Hour
11:00-11:15	20	29	49	45	60	105	34	16	50	17	15	32	58	60	118	
11:15-11:30	38	43	81	43	55	98	40	21	61	42	14	56	82	67	148	
11:30-11:45	38	35	73	42	40	82	41	24	65	38	22	60	80	61	140	
11:45-12:00	40	46	86	42	43	85	36	39	75	46	19	65	82	74	156	
12:00-12:15	60	61	121	56	54	110	50	39	89	47	37	84	107	96	202	
12:15-12:30	30	55	85	25	49	74	55	29	84	44	24	68	77	79	156	
2:30-12:45	50	65	115	45	52	97	36	34	70	29	29	58	80	90	170	798
12:45-1:00	65	60	125	60	54	114	60	47	107	47	37	84	116	99	215	
1:00-1:15	85	80	165	45	49	94	33	32	65	40	32	72	102	97	198	
1:15-1:30	60	50	110	54	50	104	43	34	77	42	29	71	100	82	181	
1:30-1:45	60	65	125	55	61	116	61	45	106	38	23	61	107	97	204	
1:45-2:00	60	61	121	60	54	114	47	35	82	40	29	69	104	90	193	
Totals	606	650	1256	572	621	1193	536	395	931	470	310	780	1092	988	2080	
Peak Hour:	270	255	525	214	214	428	197	158	355	167	121	288	424	374	798	
PHF:			1.05			0.92			0.83			0.86			0.93	

Variations: 23% @ Friendly Road Driveway.
23% @ Old Alturas Drieway.
23% Day-to-Day Variance.

Notes:
xxx *Denotes Peak Hour.*

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ATTACH. F-2

TRIP GENERATION RATE

The goal is to compare the existing trip generation rate to the published rates in *Trip Generation Manual, 9th Edition, Institute of Transportation Engineers* (ITE Manual). **Table 3 and Table 4** summarizes the ITE Manual and actual observed trip rates.

TABLE 3
Weekday PM Peak Hour

ITE Trip Generation Analysis

Landuse Category	Units	PM Peak Rate/Units		
		Total	In	Out
Discount Club (857)	per ksf	4.18	50%	50%
Landuse	**Quantity**	**PM Peak Hour Trips**		
		Total	In	Out
COSTCO	123	514	257	257

Notes:
1. ksf = 1,000 square feet.
2. Trip rates based on equations as presented in the ITE Trip Generation Manual 9th edition Pg. 1714).

Observed Trip Generation

Landuse Category	Units	PM Peak Rate/Units		
		Total	In	Out
Discount Club (857)	per ksf	5.23	49%	51%
Landuse	**Quantity**	**PM Peak Hour Trips**		
		Total	In	Out
COSTCO	123	643	315	328

Notes:
1. ksf = 1,000 square feet.
2. Trip rates based on actual counts.

For the Weekday PM Peak Hour, the observed total trip rate is 20% higher than the ITE Manual rate. It is noteworthy that the data in the ITE Manual is highly variable with Weekday PM Peak Hour trip rates ranging from 1.85 to 8.13 trips per ksf.

TABLE 4
Saturday Peak Hour

ITE Trip Generation Analysis

Landuse Category	Units	SAT Peak Rate/Units		
		Total	In	Out
Discount Club (857)	per ksf	6.37	49%	51%
Landuse	**Quantity**	**PM Peak Hour Trips**		
		Total	In	Out
COSTCO	123	784	384	400

Notes:
1. ksf = 1,000 square feet.
2. Trip rates based on equations as presented in the ITE Trip Generation Manual 9th edition (pg. 1718).

Observed Trip Generation

Landuse Category	Units	SAT Peak Rate/Units		
		Total	In	Out
Discount Club (857)	per ksf	6.49	53%	47%
Landuse	**Quantity**	**PM Peak Hour Trips**		
		Total	In	Out
COSTCO	123	798	424	374

Notes:
1. ksf = 1,000 square feet.
2. Trip rates based on actual counts.

For the Saturday Peak Hour, observed total trip rate is 2% higher than the actual observed rate. While this is encouraging, it is noteworthy that the data in the ITE Manual is highly variable with Saturday Peak Hour trip rates ranging from 3.79 to 12.52 trips per ksf.

RECOMMENDATIONS FOR USING THIS DATA

If the goal is to establish a local trip rate, this data should be used with caution and the guidance contained in the ITE Manual User's Guide and Handbook should be considered:

> *"Sufficient sample size is necessary to enable the analyst to draw valid conclusions from the trip generation study... Common practice in the traffic planning industry has been to collect trip generation data at three to five sites that truly meet the recommended site selection criteria with the assumption that these data will yield a relatively stable sample.*

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ATTACH F-3

If the analyst intends to establish a local trip generation rate, it is recommended that at least three sites (and preferably at least five) be surveyed."

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ATTACH. F-4

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ENGINEERING SOLUTIONS

Technical Memorandum No. 3

To:	City of Redding - Engineering	**Date:**	June 10, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Proposed Approach to Traffic Volume Projections	**Job No.:**	45-5721-27
		File No.:	C2174MEM003
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Based on the approach outlined in the 5/18/16 Technical Memorandum No. 2, Omni-Means developed ***DRAFT*** future year traffic volumes.

2015 Traffic Volumes

Omni-Means collected AM and PM peak hour intersection turn movement counts at the study intersections on Thursday, November 12, 2015. These volumes were used as a base-line for future year projections. See attached figure for the traffic volumes.

2025 Traffic Volumes

Omni-Means used the latest version of the Shasta Regional Travel Demand Model (Model) to derive the Year 2025 volumes. The following adjustments were made to the Model for this project:

1. Dwelling units and numbers of employees were updated.
2. Assumed 160ksf BoxCo, 16 fueling positions & 30ksf general retail. The BoxCo TAZ was artificially adjusted in the Model to match ITE rates. ITE rates for the fueling positions were reduced by 50% for internal capture with the BoxCo (i.e. 50% of the fueling trips are new trips to the TAZ).
3. Assumed 80% development. The California Gold (S. Bonnyview / Churn Creek Retail) TAZ was artificially adjusted in the Model to approximately match the ITE methodology used in the Use Permit application's May 2016 traffic analysis by Omni-Means.
4. Assumed full development. The Terraces TAZ was artificially adjusted in the Model to approximately match the ITE methodology used in the 10-15-16 Use Permit pre-application traffic analysis by KD Anderson.

2045 Traffic Volumes

1. The Model only goes out to Year 2035. Before making any of the adjustments described below, the Model's base Year 2035 traffic was increased by approximately 0.25% per year to represent a "starting place" for Year 2045 traffic.
2. Dwelling units and numbers of employees were updated.
3. Assumed full build-out of BoxCo site with artificial adjustments in the Model to match ITE rates.

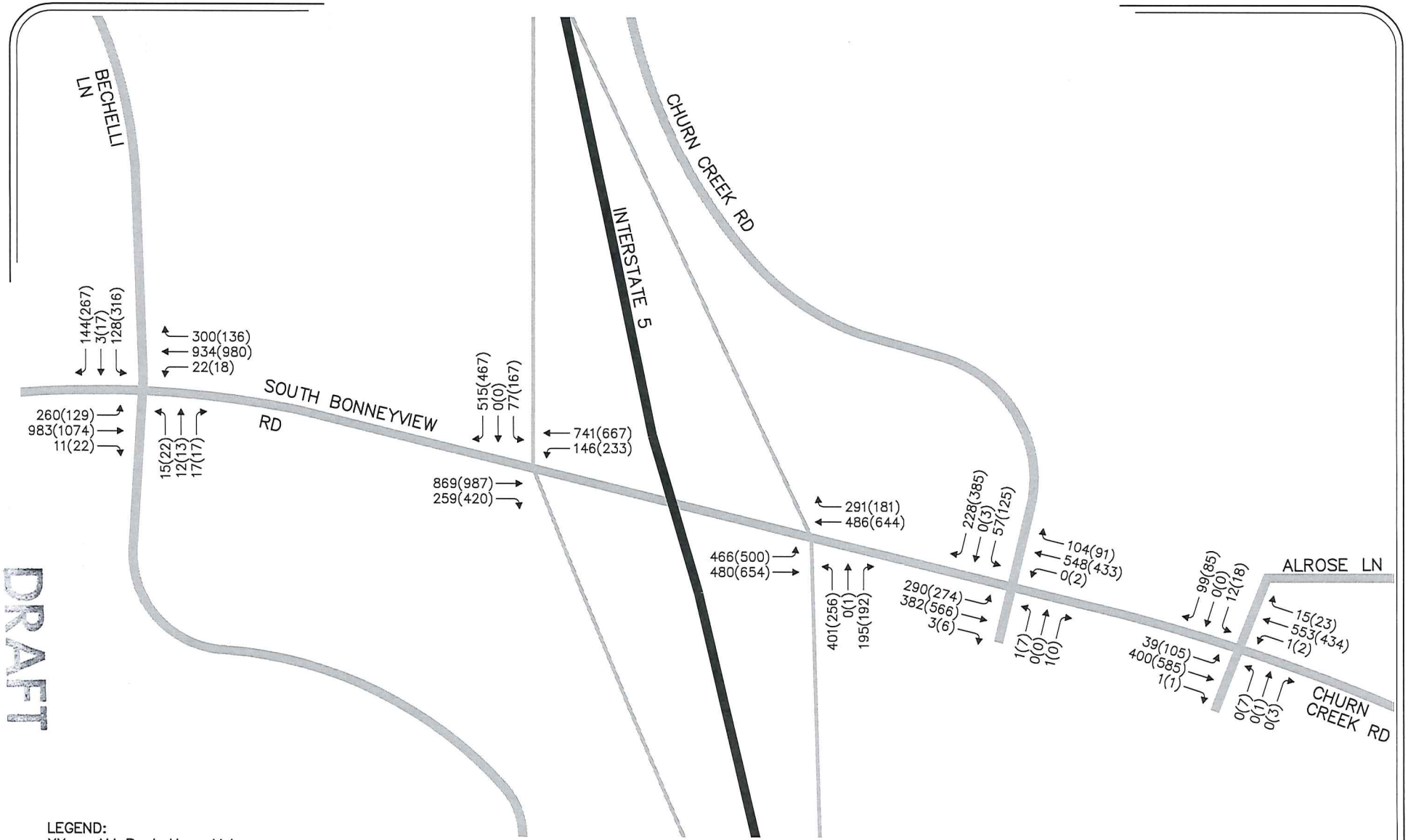
4. Assumed full build-out of California Gold site with artificial adjustments in the Model to match ITE rates.
5. Assumed full development as described in Year 2025 section.

2035 Traffic Volumes

Year 2035 volumes were simply interpolated between the Year 2025 and Year 2045 volumes. See attached figure that shows the derived volumes.

Next Steps -

1. Review draft June 10, 2016 turn movement volumes to identify any anomalies in the data.
2. Manually reduce the BoxCo development AM peak hour volumes. Isolate the BoxCo traffic numbers and adjust to 55% to/from I-5.
3. Prepare graphics or tables to show the adjustments and present proposed final traffic volumes.



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LEGEND:
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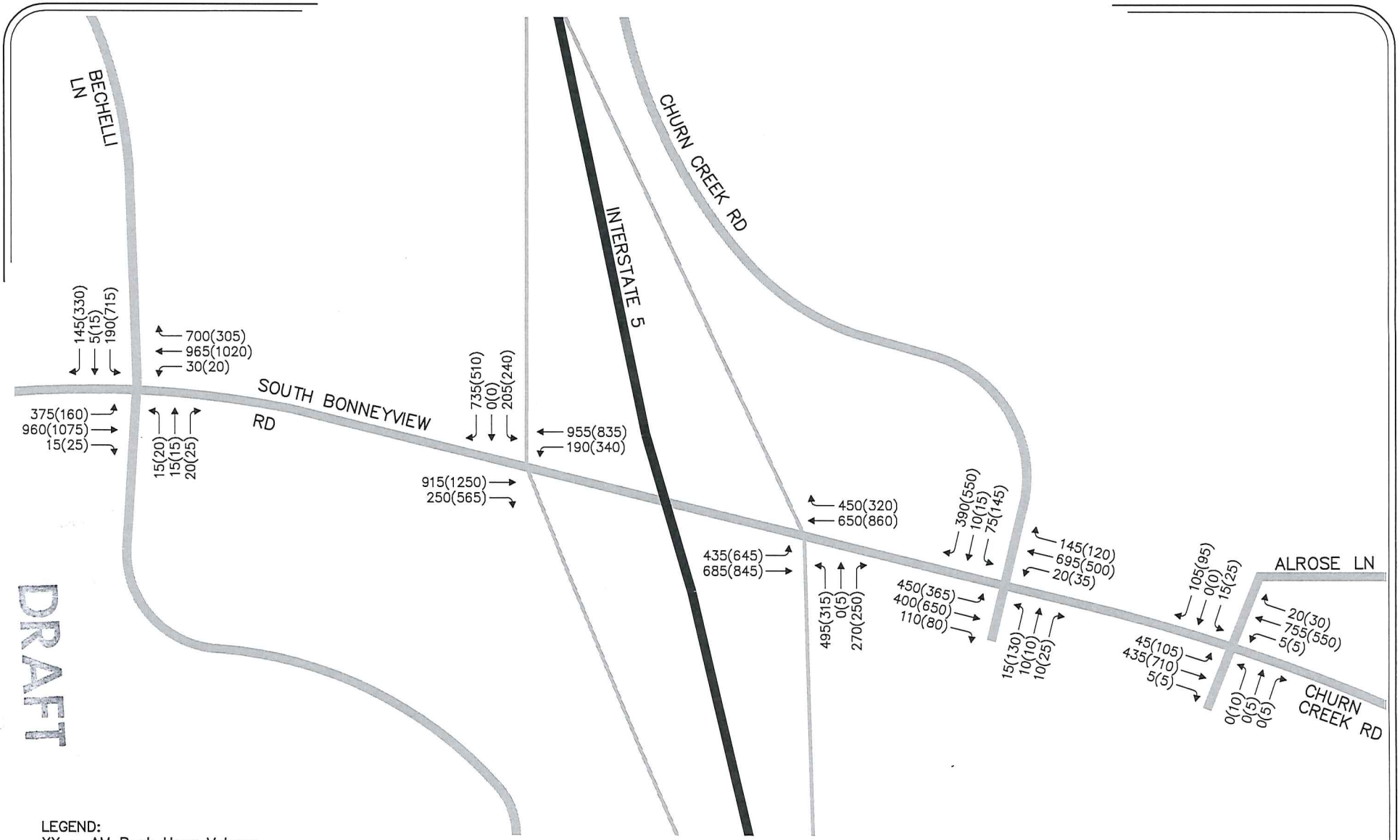
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

2015 TRAFFIC VOLUMES



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LEGEND:
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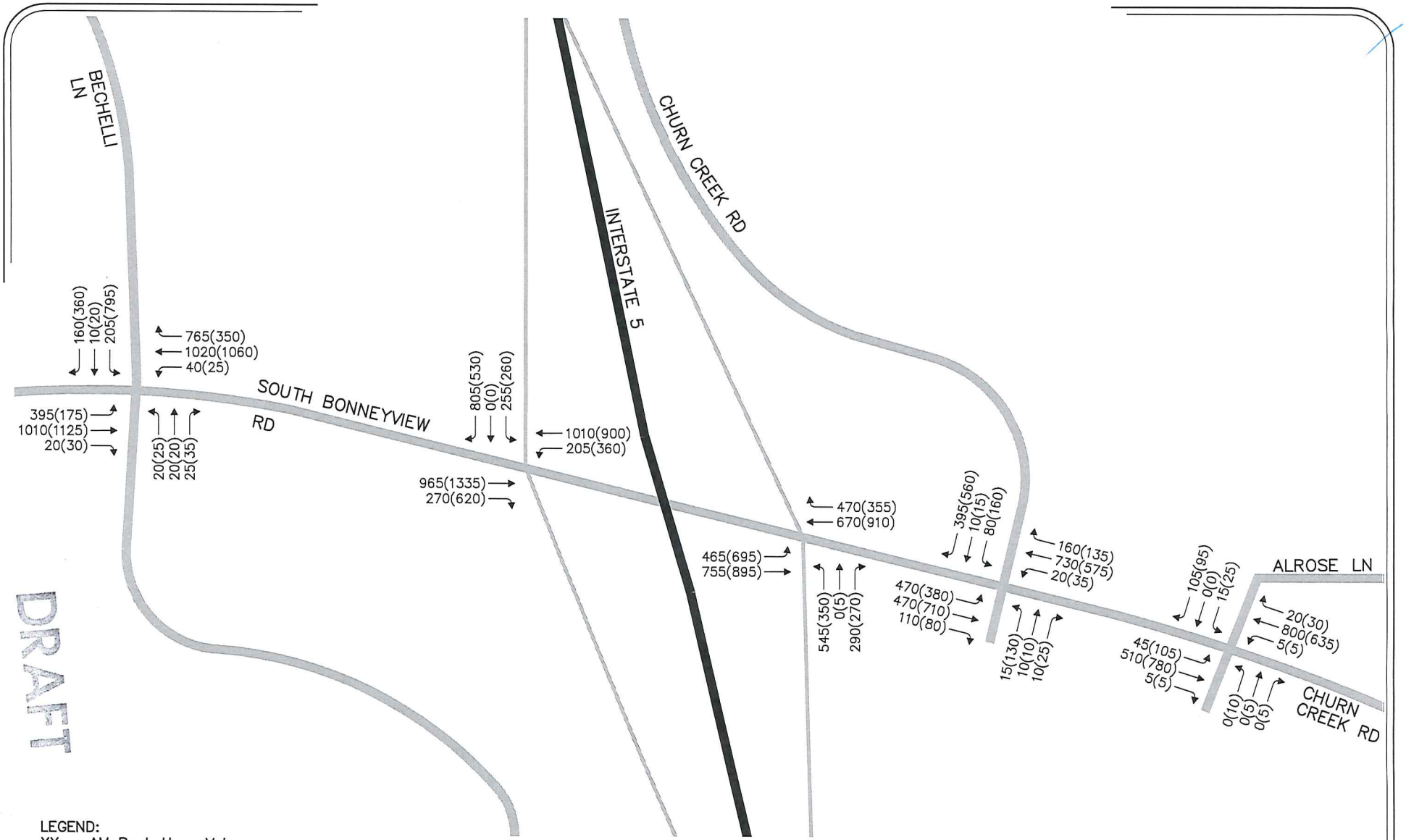
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

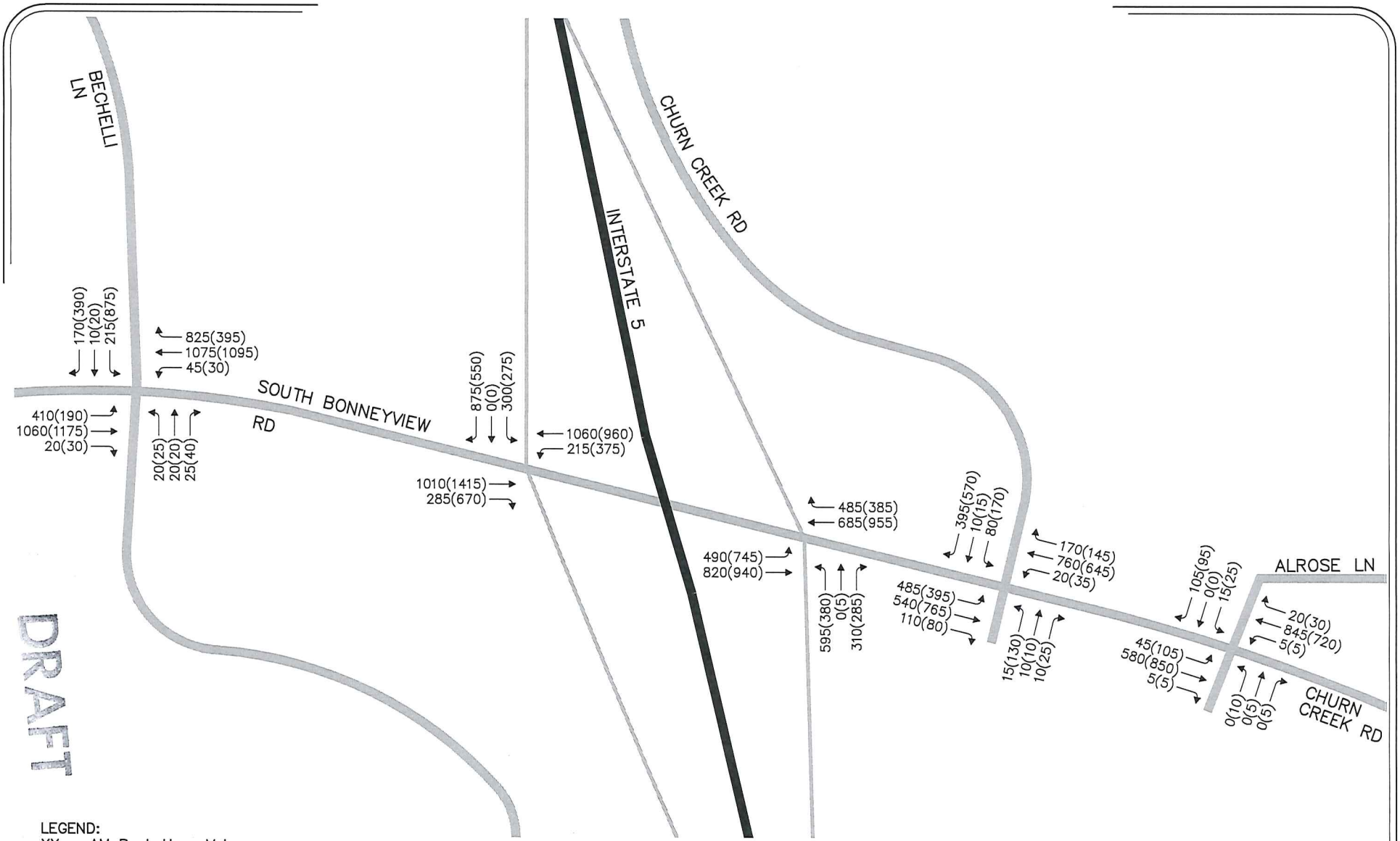
2025 TRAFFIC PROJECTIONS



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

2035 TRAFFIC PROJECTIONS



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

2045 TRAFFIC PROJECTIONS

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ENGINEERING SOLUTIONS

Technical Memorandum No. 4

To:	City of Redding - Engineering	**Date:**	June 30, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Traffic Forecasts - Proposed Volumes	**Job No.:**	45-5721-27
		File No.:	C2174MEM004
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

This technical memorandum focuses on the adjustments that were done to the ***preliminary forecasts presented in June 10, 2016 technical memorandum No. 3. In addition, this technical memorandum proposed traffic volumes to be used for the traffic operations analysis.***

June 10, 2016 Data Anomalies

Issue: City and Caltrans staff were concerned that there may be some anomalies in the traffic volumes presented in Technical Memorandum No. 3.

Resolution: Detailed intersection-by-intersection traffic volume figures have been prepared. No anomalies were identified that warrant adjustments. See **Attachment A.**

BoxCo Trip Distribution

Issue: At the 6/10/16 meeting, agreement was reached that approximately 55% of the BoxCo's trips should be to/from Interstate 5.

Resolution: Trip distribution for the BoxCo TAZ was obtained using the Shasta Regional Travel Demand Model's (Model) select zone component. The Model forecasts that the BoxCo site will attract about 56% of the traffic from I-5. This is consistent with the PDT's recommendation. As such, adjustments associated with the trip distribution are not proposed.

BoxCo AM Trip Generation Adjustment

Issue: The forecasts in Technical Memorandum No. 3 included trips from the BoxCo site during the AM peak hour.

Resolution: A review of the 2015 adjacent street peak hour data indicates that the AM peak hour occurs between 7:15 and 8:15 AM. This is outside of an anticipated BoxCo's operating hours. As such, trips from the BoxCo site had to be adjusted (removed) from the forecasts. While one can expect a small number of employee and delivery trips during the peak hour, for simplicity of calculation, the all of the AM peak hour trips will be removed from the proposed traffic forecasts. See **Attachment B** for proposed adjustments that will be made to Technical Memorandum No. 3 data.

The Terraces AM Trip Generation Adjustment

Issue: The Model underestimates the trips from the TAZ that contains The Terraces.

Resolution: A review of the Model trips from this TAZ reveals that the Model's trip generation is significantly lower than the trip generation from the traffic study. This is due to high intense uses being proposed for the site. As such, AM peak hour trip adjustments are proposed in **Attachment C.**

Final Proposed Peak Hour Traffic Forecasts

Final AM peak hour forecasts were derived by adjusting the Technical Memorandum No. 3 data:

- To remove Model trips from BoxCo.
- To adjust trips for The Terraces.

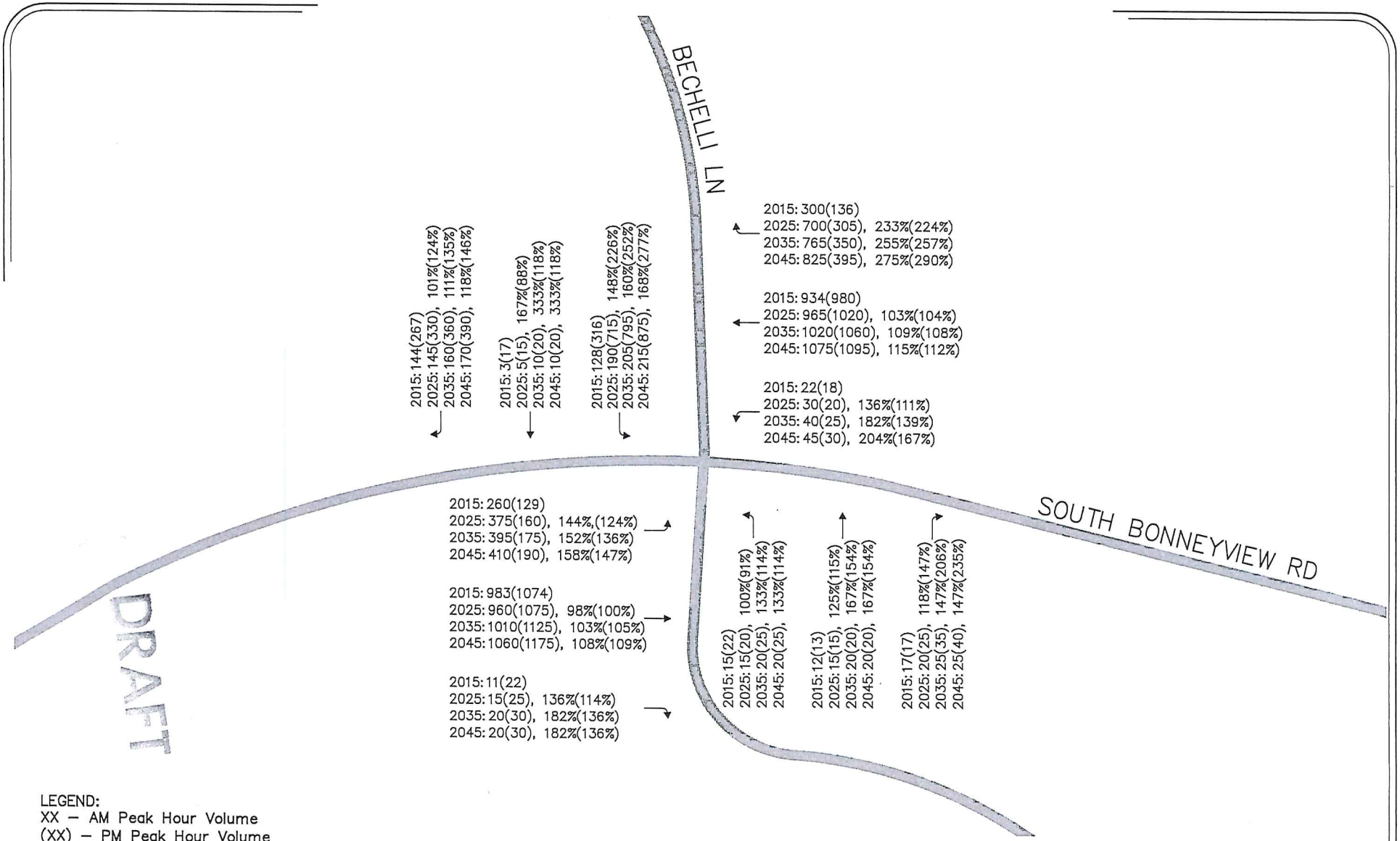
For the PM peak hour, no change to the data presented in Technical Memorandum No. 3 is proposed.

Final proposed traffic forecasts, to be used for the traffic operations analysis, are presented in **Attachment D.**

Next Steps

1. Perform Model select link analysis for the BoxCo TAZ for the PM peak hour.
2. Perform Model select link analysis for the California Gold TAZ for AM and PM peak hours.
3. Present results from the select link analysis. Omni-Means to email the results to the CT/City team by C.O.B. on Friday, 7/1/16. CT/City team to provide review by C.O.B. on Friday 7/8/16.
4. Next meetings: 7/15/16 at 7am.
5. Goals for next meeting:
   - Final approval of traffic forecasts.
   - Presentation/approval of technical analysis parameters and tools for T. Ops. analysis.
   - Roles/resp. for T. Ops. analysis.





LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

A-1

INTERSECTION VOLUME SUMMARIES - JUNE 10, 2016 DATA

6/28/2016 11:04 AM K:\PRJ\2174\T2174\T2174TG003.DWG

JOB NO: 45-5721-27



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

INTERSECTION VOLUME SUMMARIES - JUNE 10, 2016 DATA

A-2

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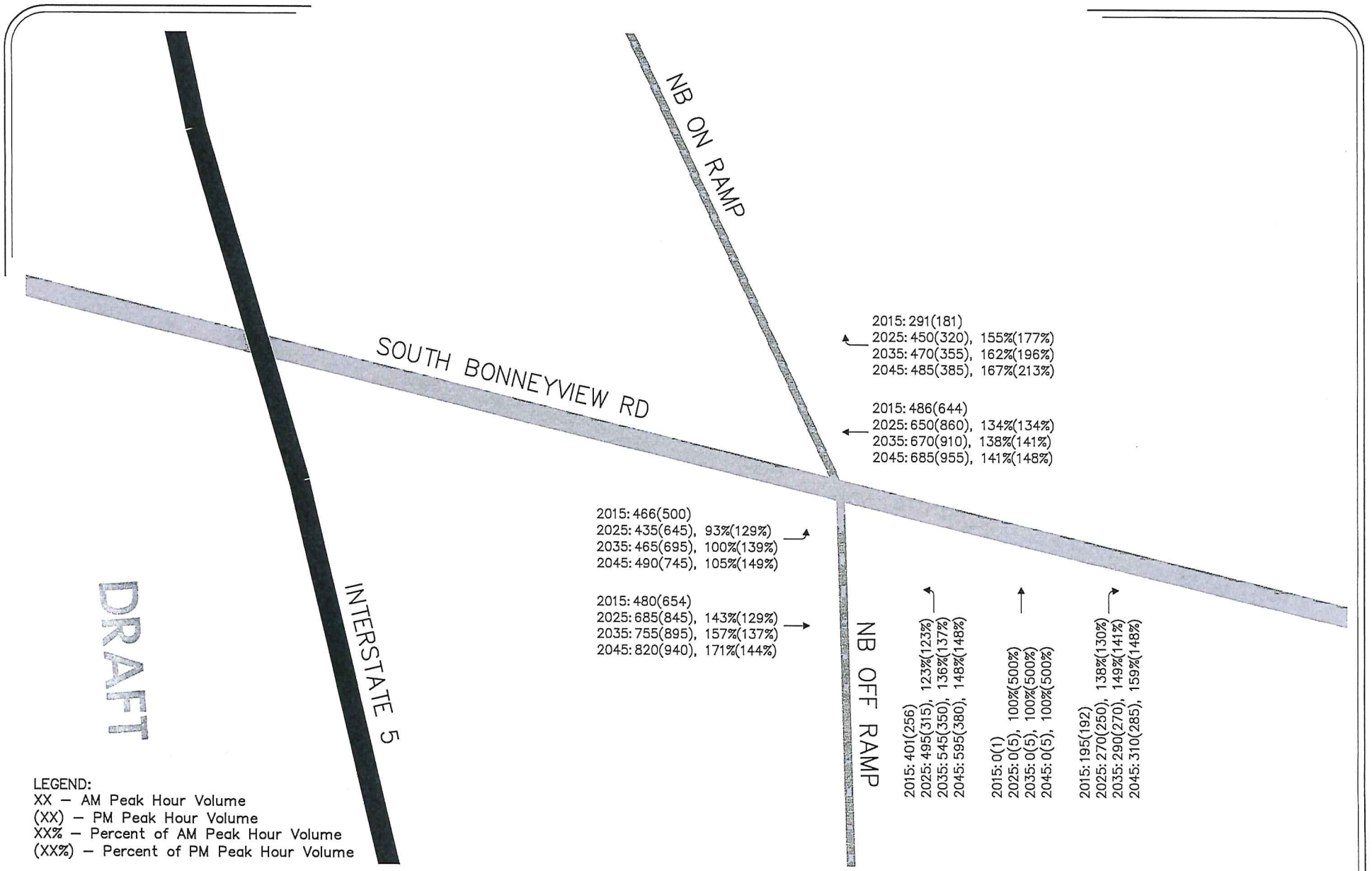
JOB NO: 45-5721-27



A-3

I-5/South Bonnyview Interchange PSR Traffic Operations Report

INTERSECTION VOLUME SUMMARIES - JUNE 10, 2016 DATA

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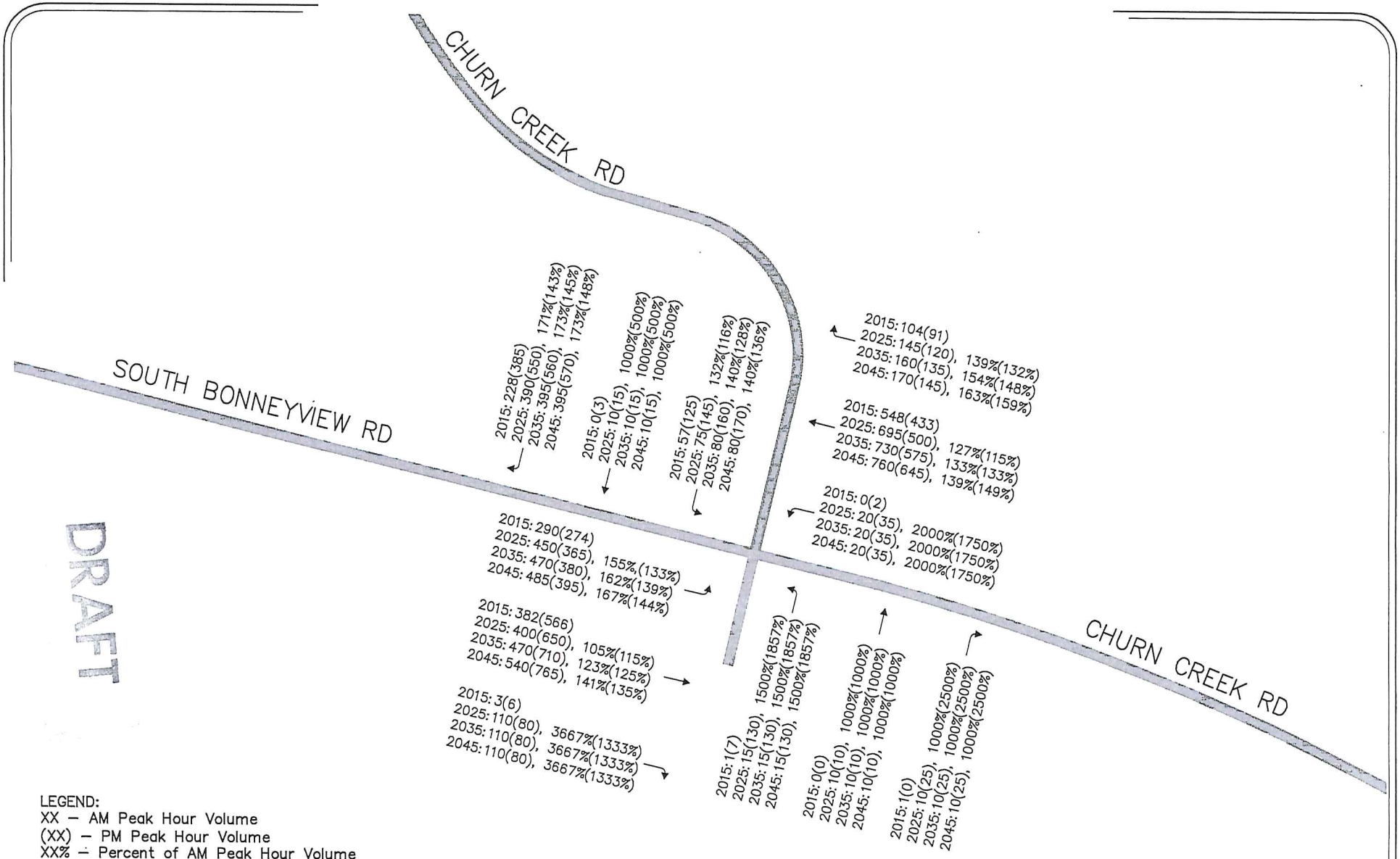

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LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

A-4

INTERSECTION VOLUME SUMMARIES - JUNE 10, 2016 DATA

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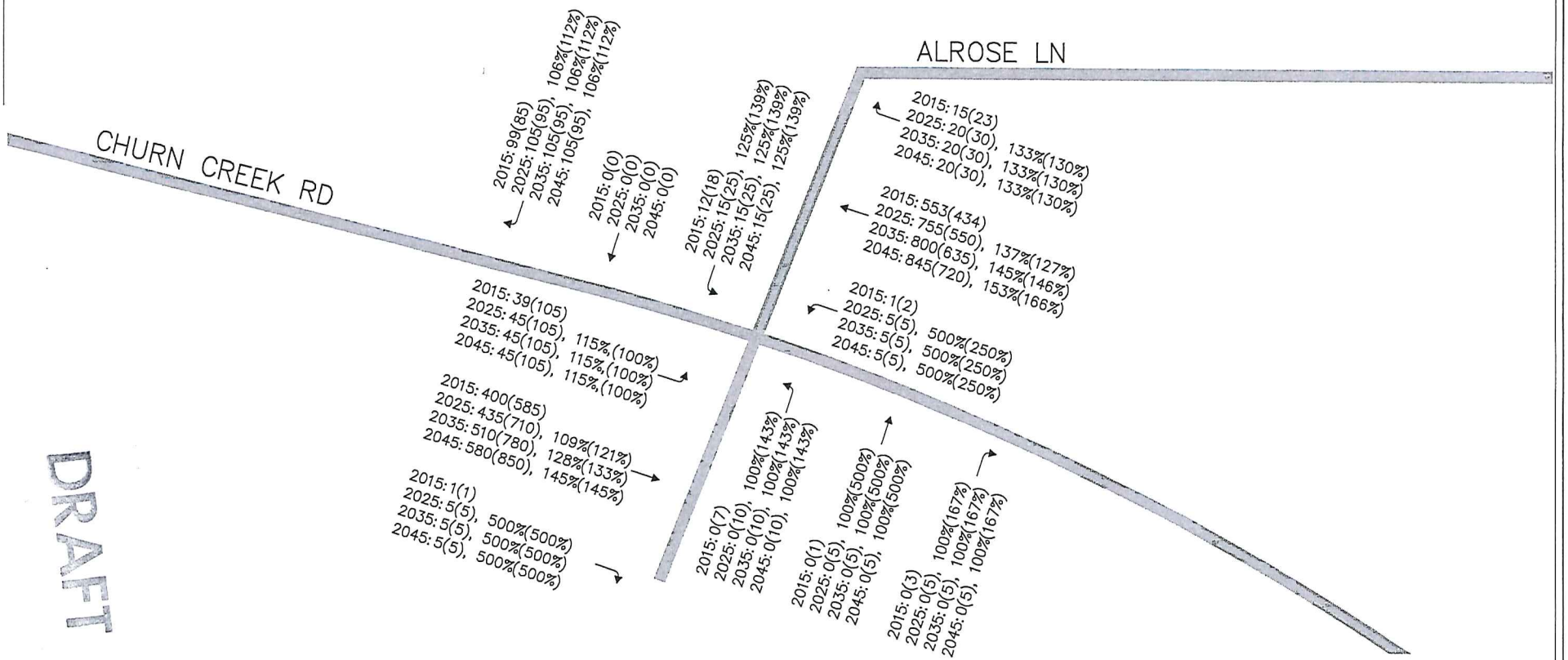

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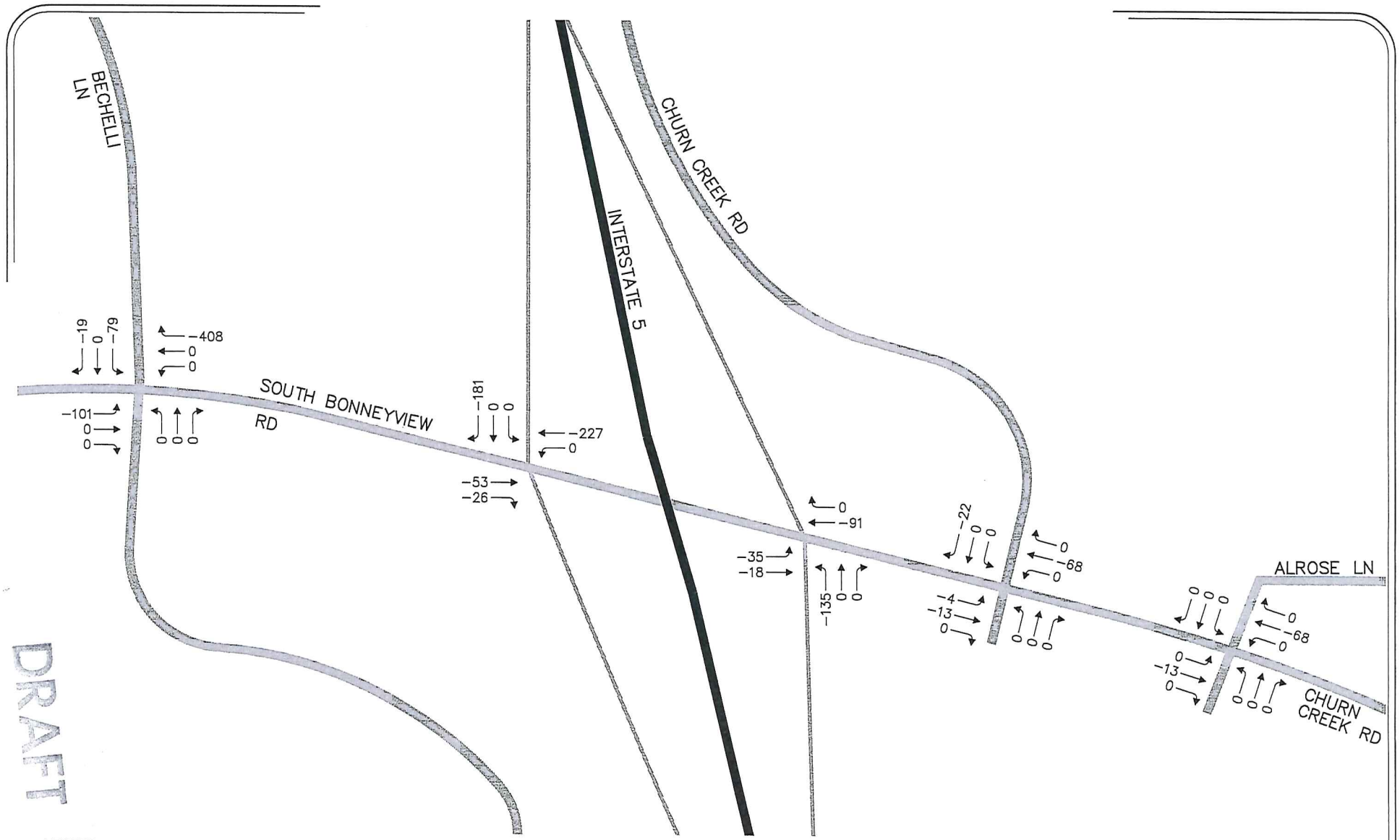
LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

INTERSECTION VOLUME SUMMARIES - JUNE 10, 2016 DATA

A-5



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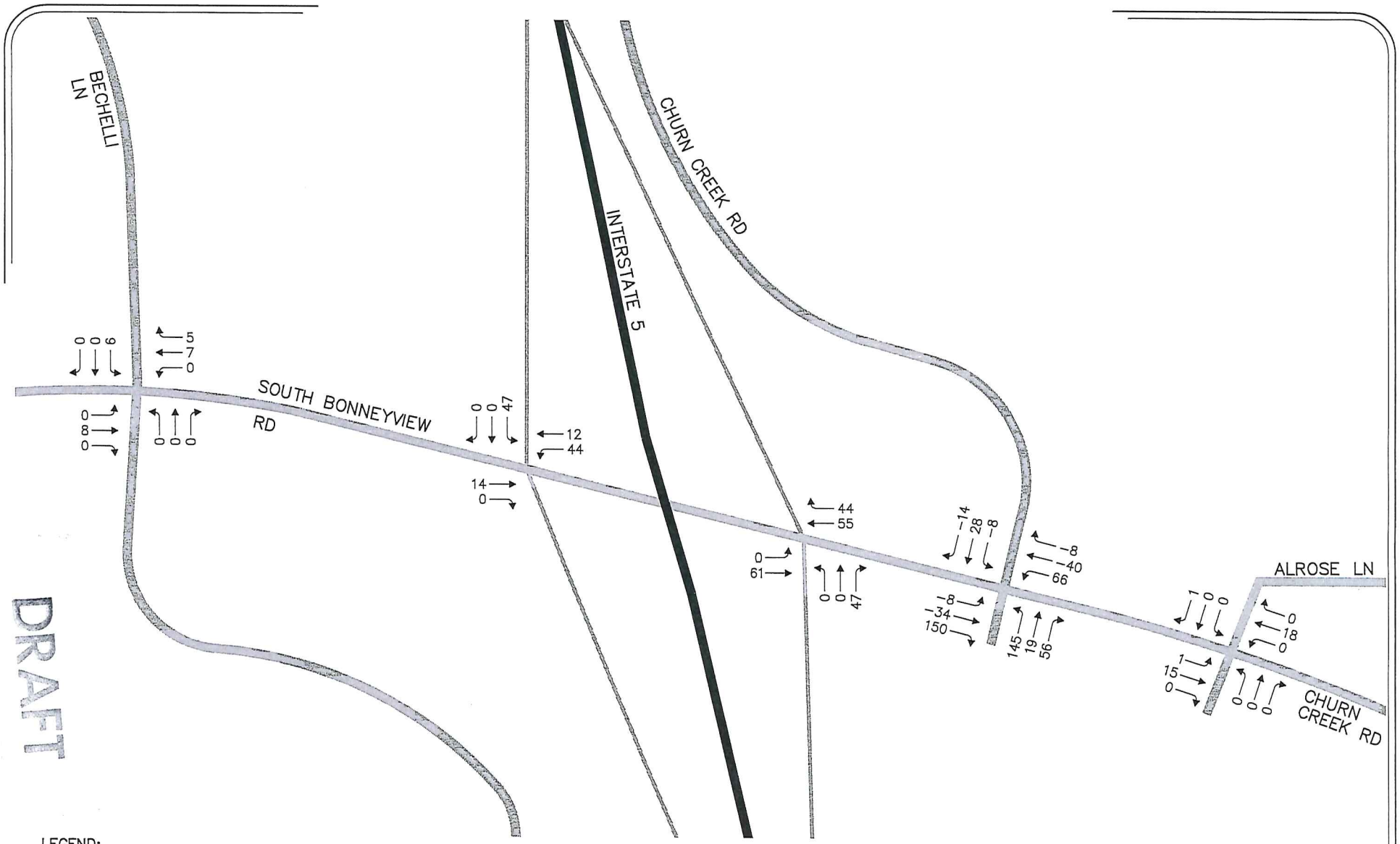
LEGEND:
XX – AM Peak Hour Volume for "BoxCo" used in 6/10/16 Tech Memo No. 3 (To be Deducted from final Traffic Forecasts)

I-5/South Bonnyview Interchange PSR Traffic Operations Report

AM PEAK ADJUSTMENT FOR 2045 "BOXCO"

B



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LEGEND:
XX – AM Peak Hour Volume for "The Terraces" used in 6/10/16 Tech Memo No. 3 (To be added/subtracted from final Traffic Forecasts)

I-5/South Bonnyview Interchange PSR Traffic Operations Report

AM PEAK ADJUSTMENT FOR 2045 "THE TERRACES"



DRAFT

LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

PROPOSED INTERSECTION VOLUMES - JUNE 30, 2016

D-1



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

PROPOSED INTERSECTION VOLUMES - JUNE 30, 2016

D-2

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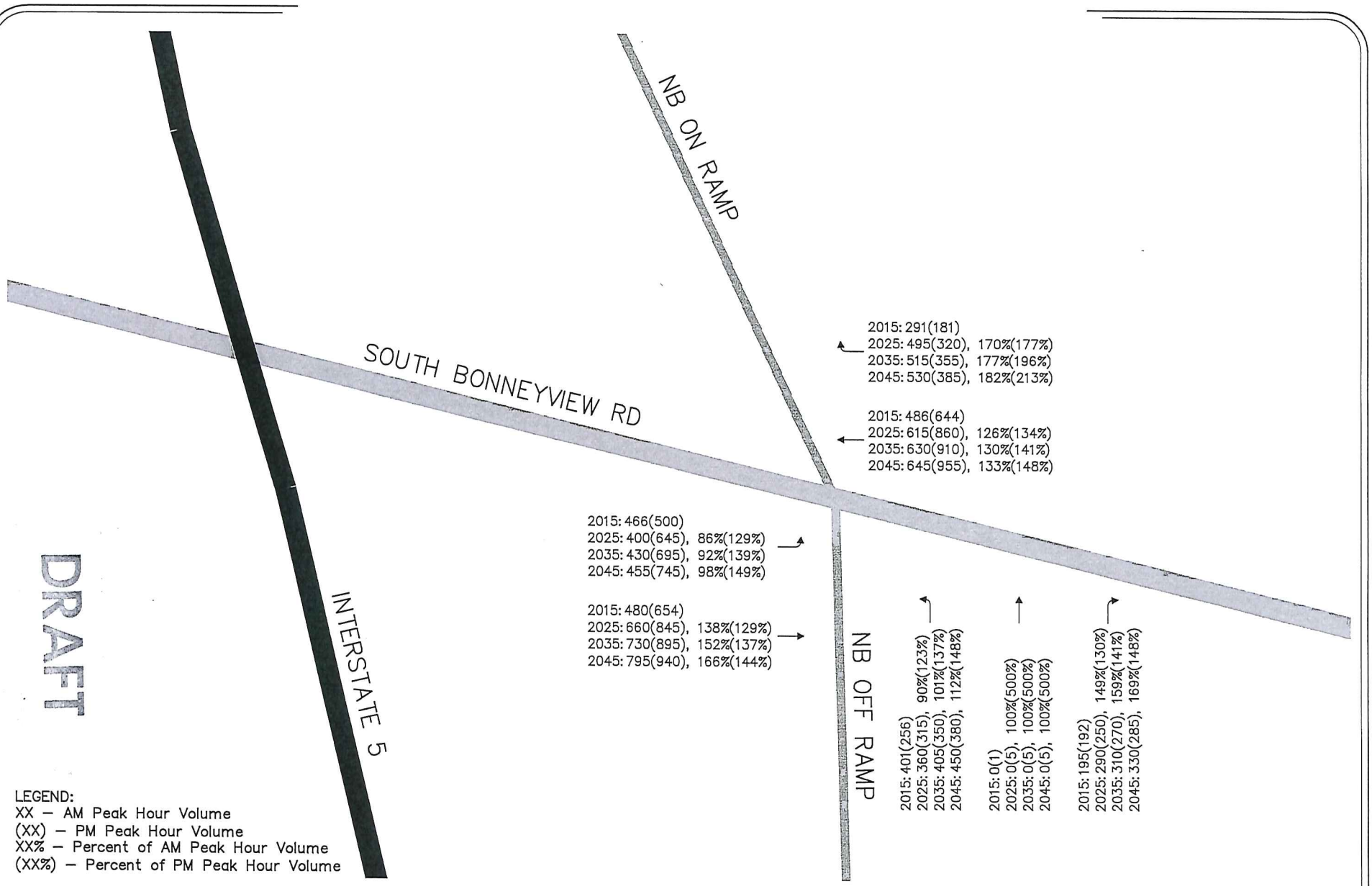
JOB NO: 45-5721-27



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I-5/South Bonnyview Interchange PSR Traffic Operations Report

PROPOSED INTERSECTION VOLUMES - JUNE 30, 2016

D-3

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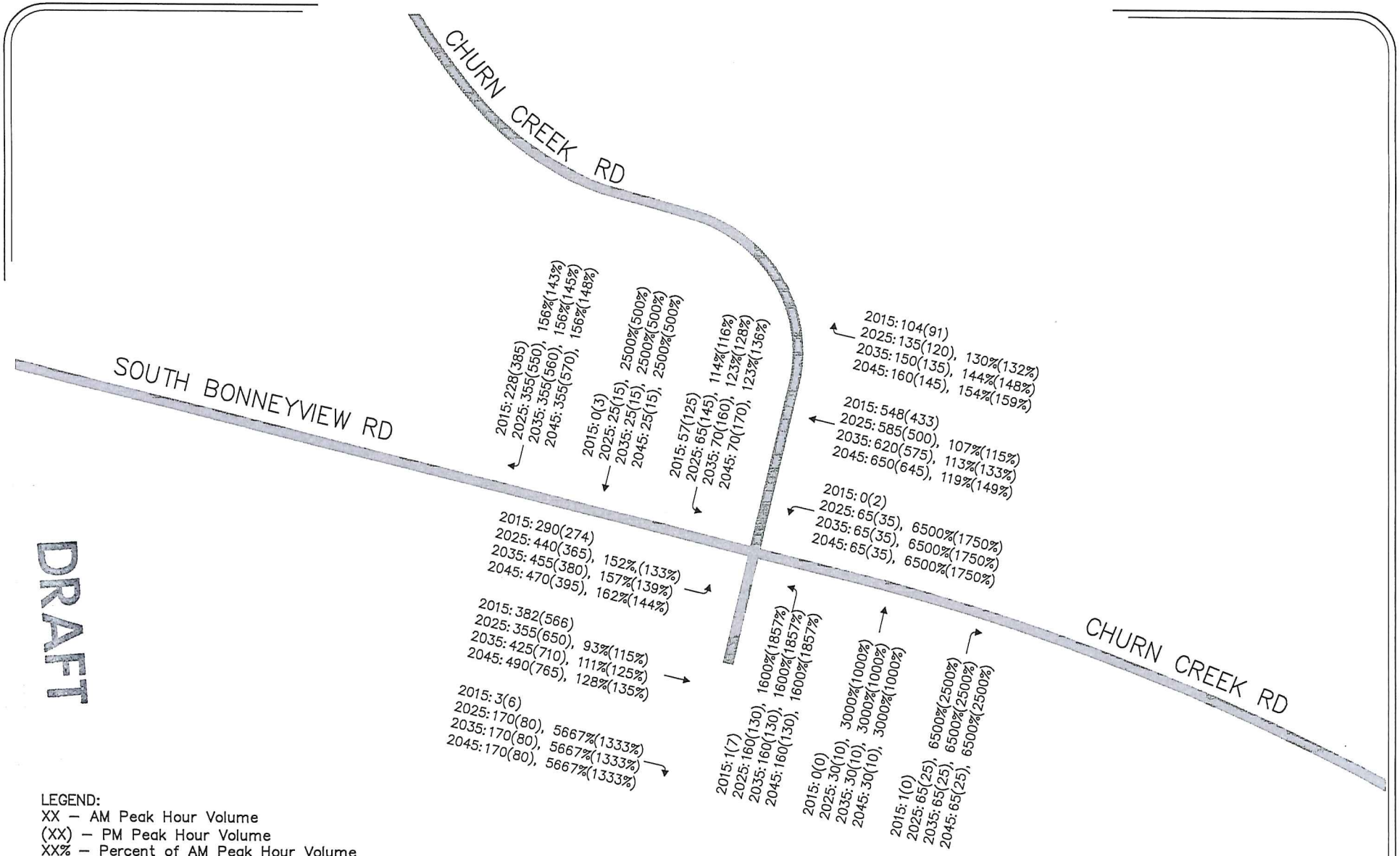
JOB NO: 45-5721-27



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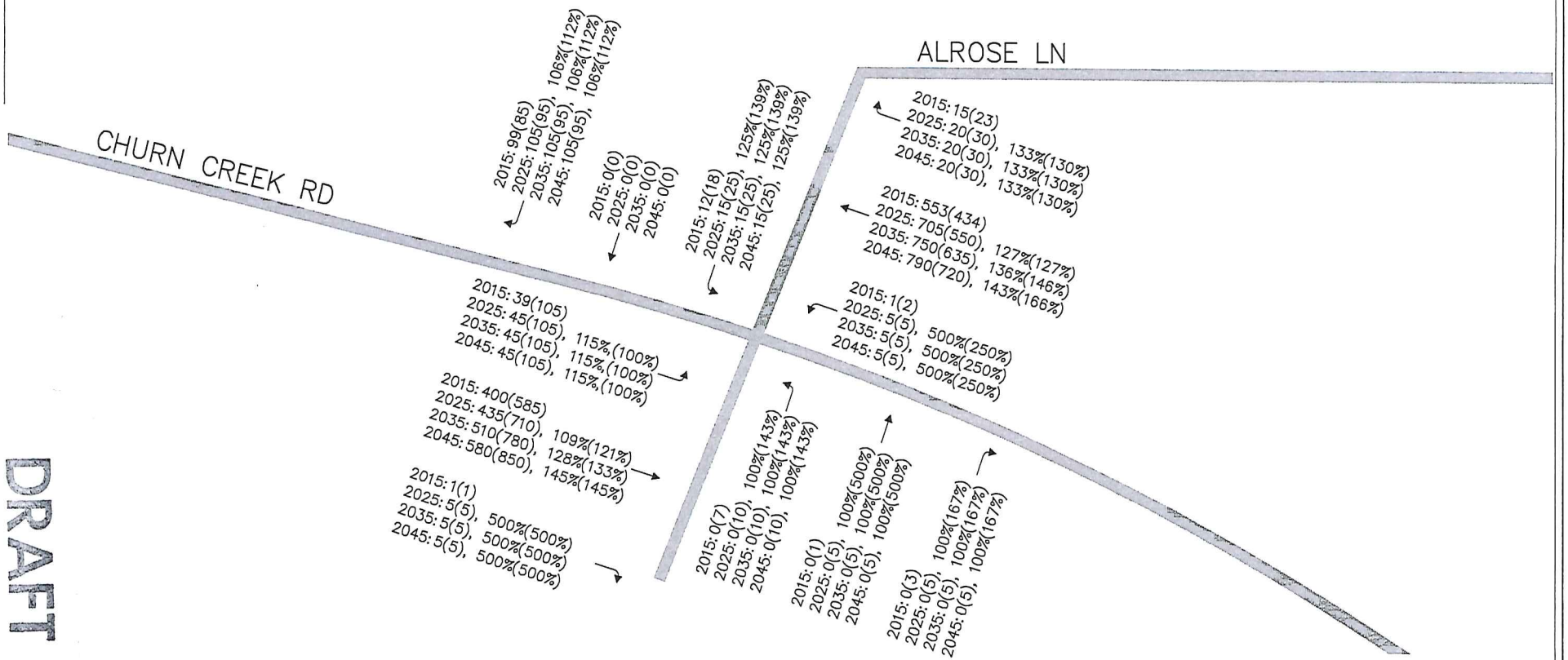
LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

PROPOSED INTERSECTION VOLUMES - JUNE 30, 2016

D-4



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LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume
XX% – Percent of AM Peak Hour Volume
(XX%) – Percent of PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

PROPOSED INTERSECTION VOLUMES - JUNE 30, 2016

D-5

omni · means
ENGINEERING SOLUTIONS

Technical Memorandum No. 5

To:	City of Redding - Engineering	**Date:**	June 30, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Model Select Link Analysis for "BoxCo" and "California Gold" Developments	**Job No.:**	45-5721-27
		File No.:	C2174MEM005
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

This technical memorandum provides select link analysis for the developments identified in the subject.

2045 "BOXCO" Select Link Anlaysis

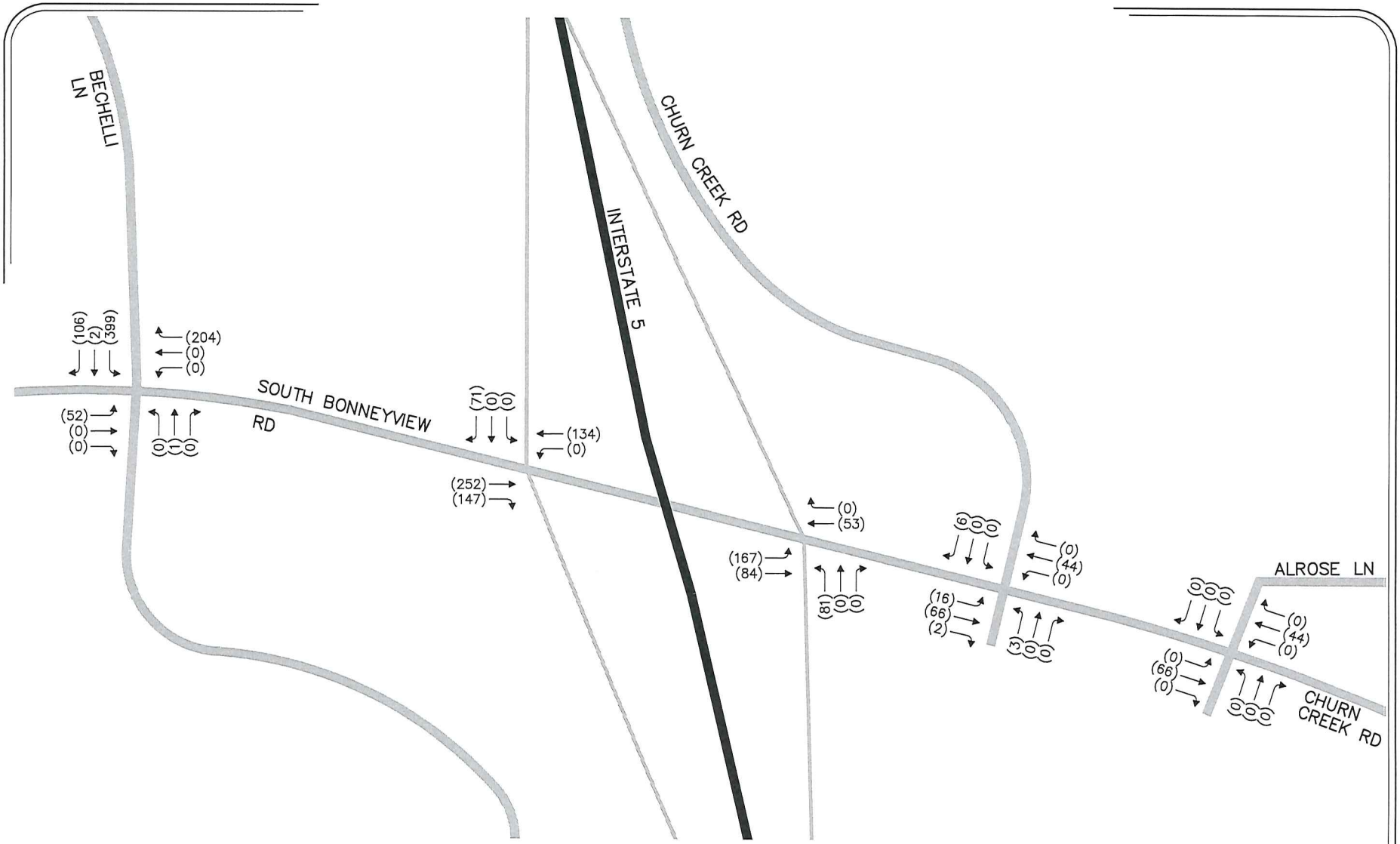
See **Attachment A.** As presented in Technical Memorandum No. 4, the AM vehicle trips have been "zero'ed" out for simplicity. Therefore, AM peak hour turn movements are **not** provided. PM peak hour turn movements are presented.

2045 "California Gold" Select Link Analysis

See **Attachment B.** Both AM and PM peak hour turn movements are presented.

Action Requested

1. City and Caltrans review of the attached data.
2. City and Caltrans approval of the proposed traffic forecasts presented in Technical Memorandum No. 4.



LEGEND:
(XX) – "BoxCo" TAZ PM Peak Hour

I-5/South Bonnyview Interchange PSR Traffic Operations Report

2045 SELECT LINK ANALYSIS "BOXCO"

A

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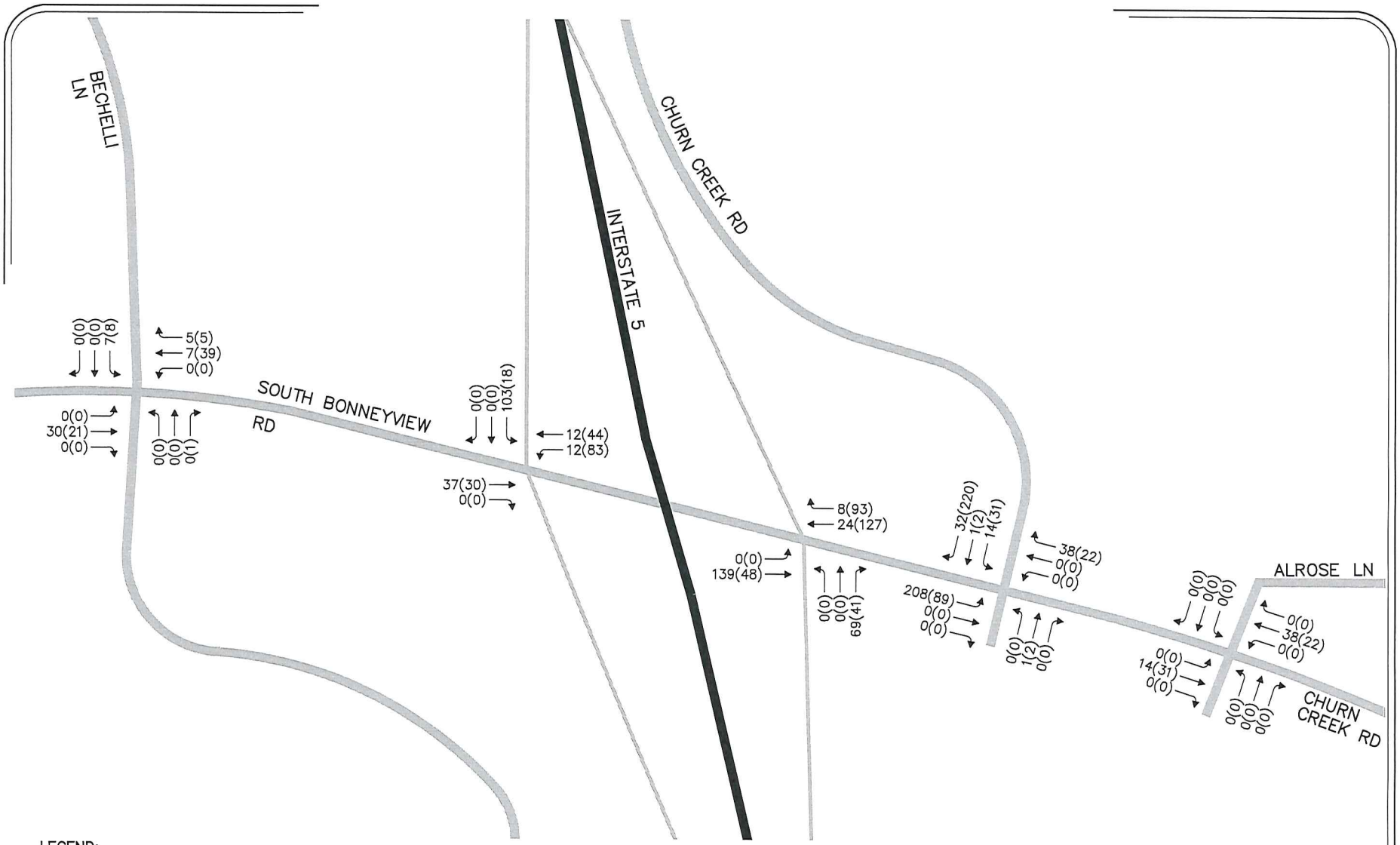
JOB NO: 45-5721-27



LEGEND:
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(XX) – "California Gold" TAZ PM Peak Hour

I-5/South Bonnyview Interchange PSR Traffic Operations Report

2045 SELECT LINK ANALYSIS "CALIFORNIA GOLD"

B

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JOB NO: 45-5721-27

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ENGINEERING SOLUTIONS

Technical Memorandum No. 6

To:	City of Redding - Engineering	**Date:**	August 12, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Final Traffic Volume Forecasts	**Job No.:**	45-5721-27
		File No.:	C2174MEM006
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

The following summarizes the approach to preparing the final traffic volumes forecasts that will be used for the Traffic Operations Report.

History

Technical Memorandum No. 4 contained proposed traffic forecasts. The following issues were identified with the data contained in Technical Memorandum No. 4:

- The PM peak hour traffic distribution for the BoxCo TAZ, from the Regional Model, did not match the ITE rates.
- The AM and PM peak hour traffic distribution for the California Gold TAZ, from the Regional Model, was suspect.

A select link analysis was performed for the BoxCo and California Gold TAZ's with the results presented in **Technical Memorandum No. 5**. Upon review of the select link analysis, it was evident that there was an imbalance between inbound and outbound trips for both TAZ's.

Via. a July 7, 2016 email, Omni-Means recommended:

- No adjustments to the overall peak hour trips from each of the TAZ's.
- Manually adjusting the inbound and outbound peak hour volumes for both TAZ's to closely match ITE rates. The manual adjustments will be based upon the ITE codes in Table 1:

Table 1: BoxCo and California Gold TAZ – Model Trips Adjusted to ITE IN/OUT Splits

		AM Peak Hour			PM Peak Hour		
Landuse	Descriptor	In	Out	Total	In	Out	Total
BoxCo[1]	Model (used in forecasts)	NA	NA	NA	444	445	889
California Gold	Model (used in forecasts)	188	166	354	236	217	453
	ITE from Traffic Study (for comparison only)	169	155	324	253	240	493

Notes 1. Trip generation for Boxco based on actual trip rates from the existing site were used. Adjusted upwards to reflect a gas station and additional retail.

Table 3: PM Peak Hour Final Traffic Volume Forecasts

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Year 2025 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	25	15	25	635	20	310	185	1090	25	20	1015	390
2	**S Bonnyview Rd/I-F SB Ramps**				280		575		1230	520	300	855	
3	**S Bonnyview Rd/I-5 NB Ramps**	325	5	250				630	880			825	285
4	**Churn Creek Rd/S Bonnyview Rd**	125	10	25	145	15	475	410	640	80	35	505	130
5	Churn Creek Rd/Alrose	10	5	5	25		95	105	700	5	5	565	30
Year 2035 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	25	20	35	715	20	340	200	1165	30	25	1070	440
2	**S Bonnyview Rd/I-F SB Ramps**	0	0	0	300	0	600	0	1335	580	330	935	0
3	**S Bonnyview Rd/I-5 NB Ramps**	360	5	275	0	0	0	680	950	0	0	900	345
4	**Churn Creek Rd/S Bonnyview Rd**	125	10	25	175	15	535	445	700	80	35	580	155
5	Churn Creek Rd/Alrose	10	5	5	25	0	95	105	785	5	5	665	30
Year 2045 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	25	20	40	795	20	365	215	1240	30	30	1120	485
2	**S Bonnyview Rd/I-F SB Ramps**				315		625		1435	640	355	1010	
3	**S Bonnyview Rd/I-5 NB Ramps**	395	5	295				730	1020			970	400
4	**Churn Creek Rd/S Bonnyview Rd**	125	10	25	200	15	595	480	755	80	35	650	180
5	Churn Creek Rd/Alrose	10	5	5	25		95	105	870	5	5	760	30

California Gold TAZ Peak Hour Adjustments

In order to document the adjustments that went into the final traffic volume forecasts, Table 4 presents the adjustments for the AM peak hour and Table 5 presents the adjustments for the PM peak hour, that are described under "History" above. The adjustments shown in Tables 4 and 5 represent the “net” adjustments between the regional model’s imbalanced trip generation/distribution and the manual trip generation/distribution. As such, there are instances where the adjustment shown in Tables 3 and 4 is negative.

For ease of calculations, the presented adjustments were applied to Year's 2025, 2035 and 2045 forecasts.

Table 4: California Gold AM Peak Hour Adjustments

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2025, 2035 & 2045 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	0	0	0	-5	0	0	0	5	0	0	14	-4
2	**S Bonnyview Rd/I-F SB Ramps**	0	0	0	-48	0	0	0	0	0	13	11	0
3	**S Bonnyview Rd/I-5 NB Ramps**	0	0	-27	0	0	0	0	-47	0	0	24	26
4	**Churn Creek Rd/S Bonnyview Rd**	0	-1	0	5	-1	50	-74	0	0	0	0	-7
5	**Churn Creek Rd/Alrose**	0	0	0	0	0	0	0	5	0	0	-7	0

Via. emails on July 11, 2016, City and Caltrans staff concurred with the July 7, 2016 Omni-Means recommendations and directed Omni-Means to:

- Manually adjust the portion of BoxCo TAZ trips that are to/from Interstate 5 to 60% to/from the north and 40% to/from the south.

Manual Adjustments

While making the adjustments described under "History" above, we noted some anomalies likely due to the model redistribution with the buildout of the proposed uses. There were instances where the 2025 volumes were lower than the existing counts. To account for these anomalies, we checked the forecasted turning movements for reasonableness and made adjustments where necessary.

Final Traffic Volume Forecasts

The final forecasts were derived with the AM forecasts presented in Table 2 and the PM forecasts presented in Table 3, and in the attached figures.

Table 2: AM Peak Hour Final Traffic Volume Forecasts

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Year 2025 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	15	15	20	145	5	155	275	1000	15	30	985	320
2	**S Bonnyview Rd/I-F SB Ramps**				190		555		890	275	250	790	
3	**S Bonnyview Rd/I-5 NB Ramps**	410		265				470	615			640	520
4	**Churn Creek Rd/S Bonnyview Rd**	160	30	65	70	25	405	365	355	170	65	585	130
5	Churn Creek Rd/Alrose				15		105	45	440	5	5	685	20
Year 2035 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	20	20	25	160	10	165	290	1055	20	40	1080	360
2	**S Bonnyview Rd/I-F SB Ramps**	0	0	0	225	0	620	0	945	300	265	865	0
3	**S Bonnyview Rd/I-5 NB Ramps**	465	0	295	0	0	0	485	690	0	0	665	540
4	**Churn Creek Rd/S Bonnyview Rd**	160	30	65	100	25	420	425	400	170	65	625	160
5	Churn Creek Rd/Alrose	0	0	0	15	0	105	45	515	5	5	745	20
Year 2045 Forecasts													
1	**S Bonnyview Rd/Bechelli Lane**	20	20	25	170	10	175	305	1110	20	45	1170	395
2	**S Bonnyview Rd/I-F SB Ramps**				255		685		995	320	275	935	
3	**S Bonnyview Rd/I-5 NB Ramps**	520		320				500	760			690	555
4	**Churn Creek Rd/S Bonnyview Rd**	160	30	65	130	25	430	480	440	170	65	665	190
5	Churn Creek Rd/Alrose				15		105	45	585	5	5	805	20

Table 5: California Gold PM Peak Hour Adjustments

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2025, 2035 & 2045 Forecasts													
1	S Bonnyview Rd/Bechelli Lane	0	0	-1	-6	0	0	0	15	0	0	-3	-3
2	S Bonnyview Rd/I-F SB Ramps	0	0	0	39	0	0	0	9	0	-40	-5	0
3	S Bonnyview Rd/I-5 NB Ramps	0	0	2	0	0	0	0	47	0	0	-45	-36
4	Churn Creek Rd/S Bonnyview Rd	0	-2	0	1	-2	-82	49	0	0	0	0	10
5	Churn Creek Rd/Alrose	0	0	0	0	0	0	0	1	0	0	10	0

BoxCO TAZ PM Peak Hour Adjustments

In order to document the adjustments that went into the final traffic volume forecasts, Table 6 presents the Year 2025 adjustments for the PM peak hour, that are described under "History" above:

Table 6: Year 2025 BoxCo PM Peak Hour Adjustments

Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2025 Forecasts													
1	S Bonnyview Rd/Bechelli Lane	0	-1	0	-72	-2	-22	24	0	0	0	0	90
2	S Bonnyview Rd/I-F SB Ramps	0	0	0	0	0	67	0	-29	-43	0	23	0
3	S Bonnyview Rd/I-5 NB Ramps	12	0	0	0	0	0	-14	-14	0	0	10	0
4	Churn Creek Rd/S Bonnyview Rd	-3	0	0	0	0	7	-2	-10	-2	0	7	0
5	Churn Creek Rd/Alrose	0	0	0	0	0	0	0	-10	0	0	7	0

Table 7 presents the Year 2035 and Year 2045 adjustments for the PM peak hour, that are described under "History" above:

Table 7: Year 2035 and 2045 BoxCo PM Peak Hour Adjustments

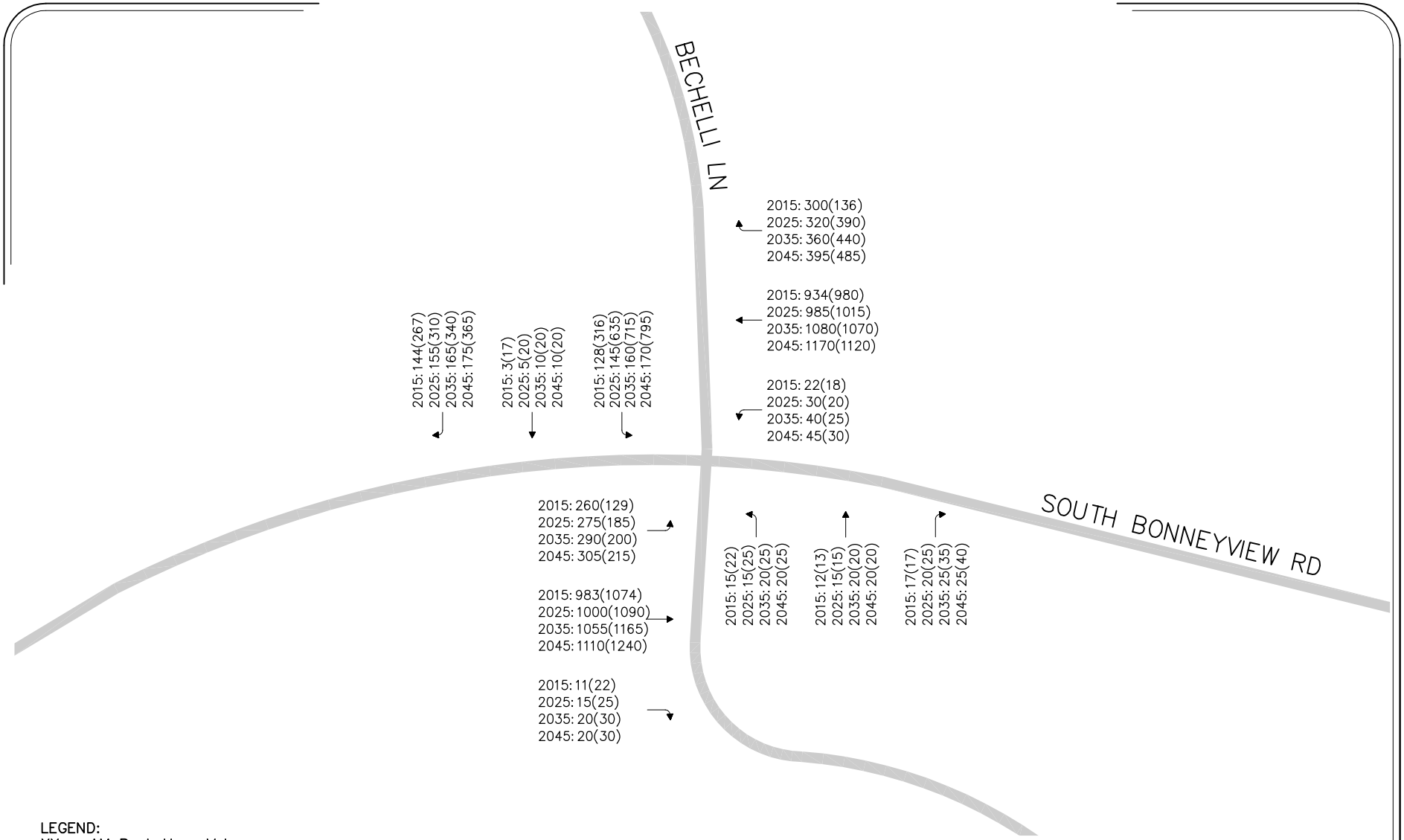
Intersection No.		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
Adjustments to 2035 & 2045 Forecasts													
1	S Bonnyview Rd/Bechelli Lane	0	-1	0	-76	-2	-23	25	0	0	0	0	95
2	S Bonnyview Rd/I-F SB Ramps	0	0	0	0	0	70	0	-30	-45	0	24	0
3	S Bonnyview Rd/I-5 NB Ramps	13	0	0	0	0	0	-15	-15	0	0	11	0
4	Churn Creek Rd/S Bonnyview Rd	-3	0	0	0	0	7	-2	-11	-2	0	7	0
5	Churn Creek Rd/Alrose	0	0	0	0	0	0	0	-11	0	0	7	0

Next Steps

1. Final agency approval of the data presented in this Technical Memorandum.
2. Agency concurrence regarding Traffic Operations technical analysis parameters. The information will be presented in Technical memorandum No. 7.

Traffic Forecast Figures

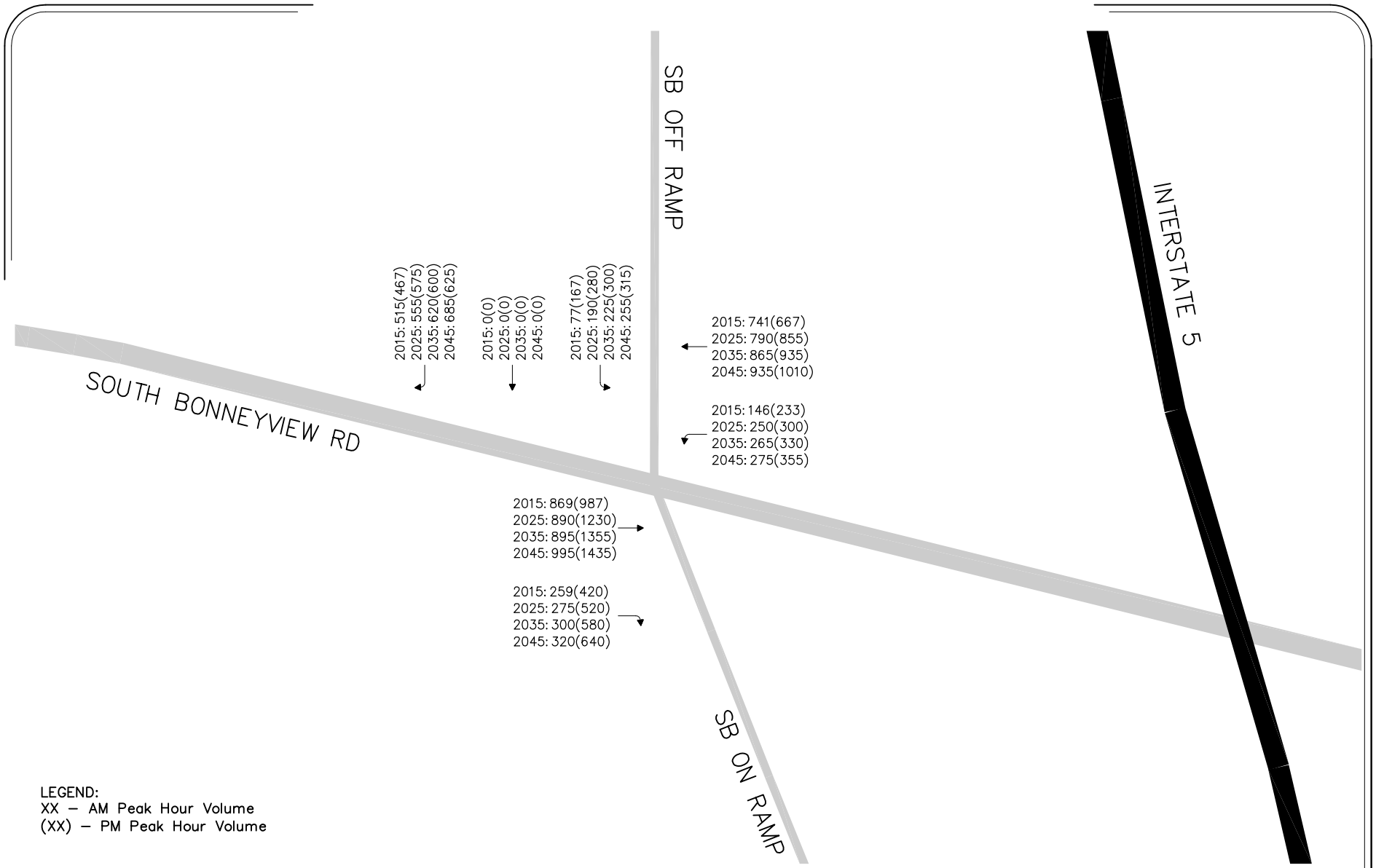
Attached are final traffic forecast figures.



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume

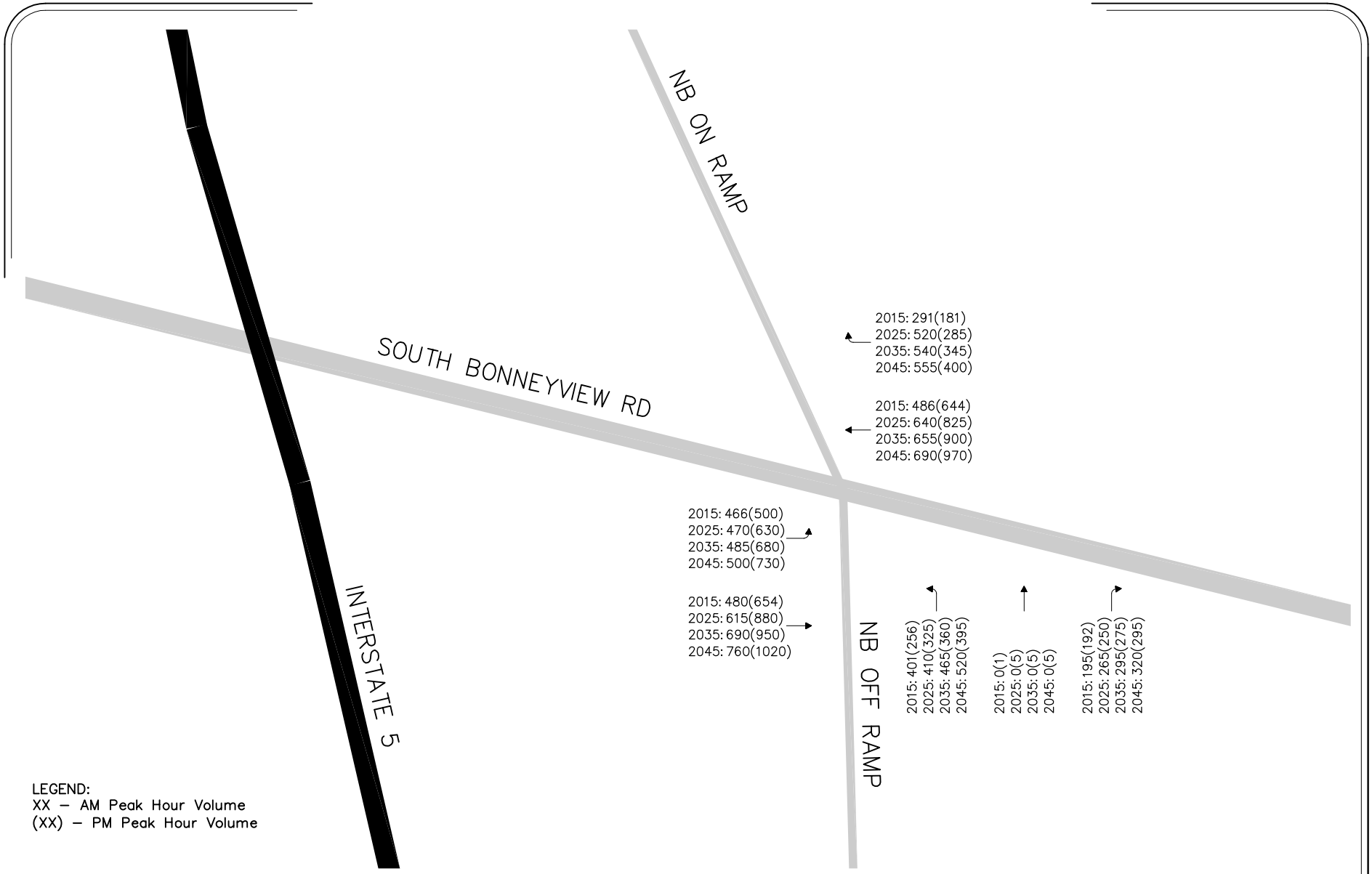
I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS



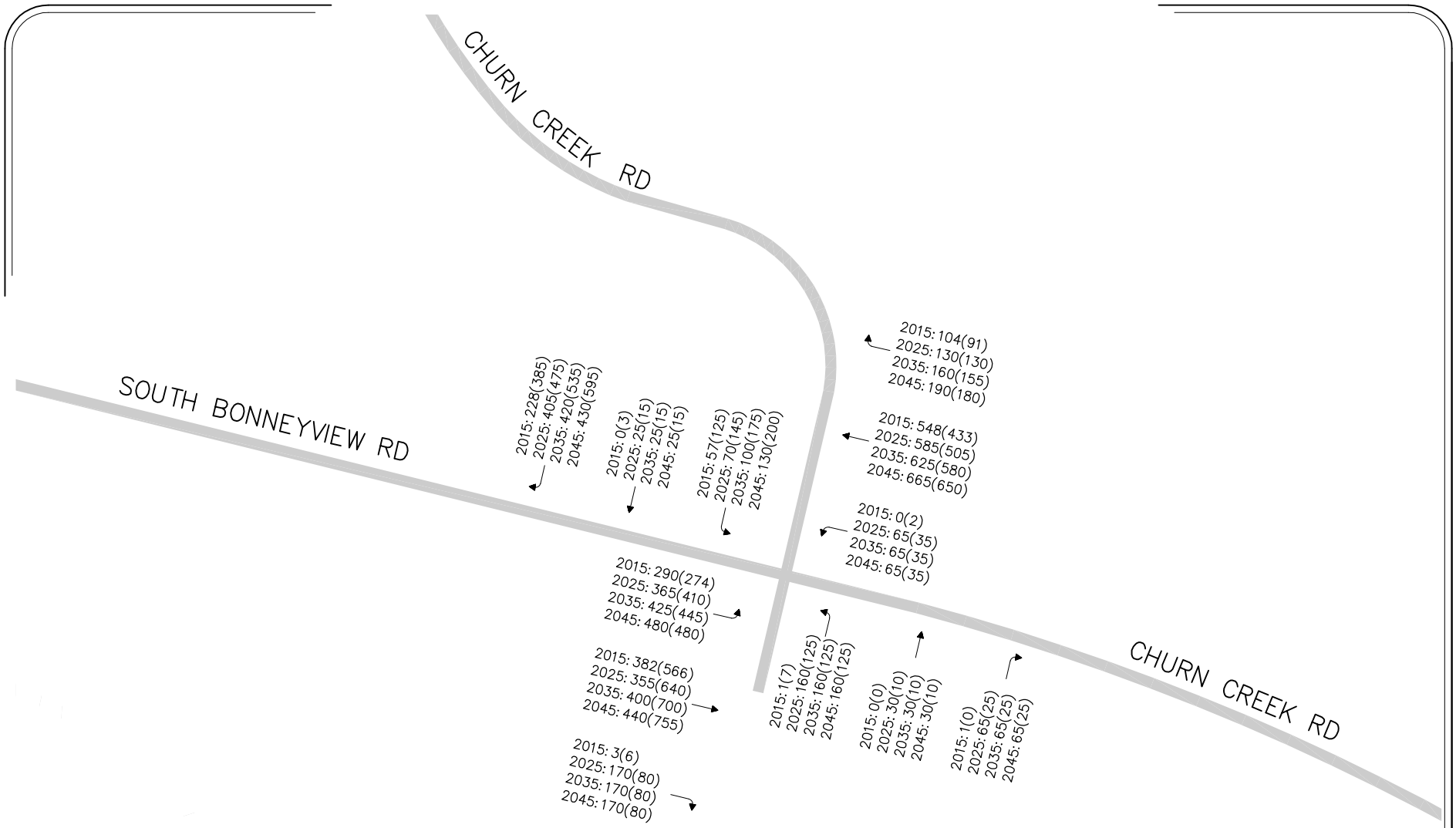
I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS



I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS



LEGEND:
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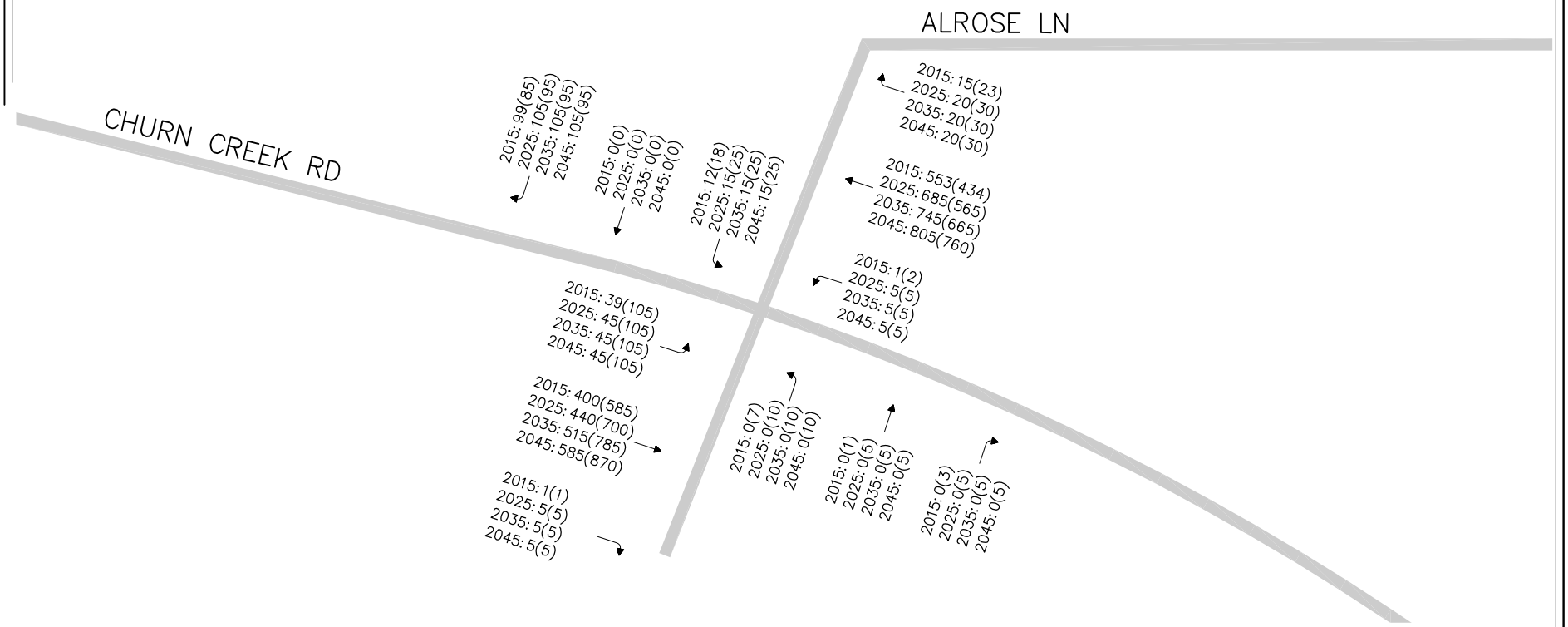
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS



LEGEND:
XX – AM Peak Hour Volume
(XX) – PM Peak Hour Volume

I-5/South Bonnyview Interchange PSR Traffic Operations Report

FINAL TRAFFIC FORECASTS

omni · means
ENGINEERING SOLUTIONS

Technical Memorandum No. 7

To:	City of Redding - Engineering	**Date:**	July 15, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Traffic Operations Analysis - Approach to Work	**Job No.:**	45-5721-27
		File No.:	C2174MEM007
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

The following summarizes the planned approach to the Traffic Operations Analysis for the above-referenced project, as presented at the July 15, 2016 focused PDT meeting.

Technical Analysis Parameters

Table 1
Synchro Parameters for Traffic Signals

1	Analysis Period - 15 Minutes
2	Peak Hour Factor (PHF)- 0.92 or higher for Year 2025, 2035 and 2045 conditions. PHF greater than 0.92 due to Existing counts showing PHF higher.
3	% Trucks: weekday peak hour analysis - from counts
4	Flat Grade
5	25 ft. assumed vehicle length for stacking and queues
6	Cycle Length - 80 sec min, 150 sec max (optimize signal timing)
7	Coordinated Cycle Length - obtained from City and Caltrans (optimize signal timing for Year 2025, 2035 & 2045 conditions)
8	Total Lost Time Per Signal Phase - 4 seconds (24 sec max for 8-phase signal)
9	Ideal saturation flow rate - 1,900 vhp or 1,710 vhp as provided in the HCM
10	Pedestrian Speed - 3.5 ft/s and 10 mph for bicycles
11	Pedestrian calls - 2025 (6); 2035 (10); 2045 (15). Existing ranges from 0 to 3
Source: Figure 4.5 City of Redding TIA Guideline January 2009, modified as appropriate	

Table 2
SIDRA Parameters for Roundabouts

SIDRA standard model will be used for roundabouts analysis.
A 1.1 environmental factor will be used in SIDRA for Year 2025 conditions, 1.05 for Year 2035 conditions and 1.0 for design year conditions.
PHF, heavy vehicles and pedestrians consistent with the Table 1 parameters.
Omni-Means will verify that the SIDRA truck length corresponds with expected conditions.

Table 3
VISSM Parameters for a Diverging Diamond Interchange (DDI)

The DDI will be modeled in VISSIM based on the preliminary concept prepared by Caltrans.
80 second minimum cycle length will be utilized.
PHF, heavy vehicles and pedestrians consistent with the Table 1 parameters.
Signal phasing will be based on the information published within the Diverging Diamond Interchange informational guide (FHWA, August 2014)

Table 4
VISSM Parameters Roundabouts

The roundabout interchange will be modeled in VISSIM based on preliminary concepts prepared by Omni-Means.
PHF, heavy vehicles and pedestrians consistent with the Table 1 parameters.
Conflict areas and/or priority rules are the two methods in VISSIM to simulate vehicle yielding behavior at the entry. We will use these methods to model the vehicle yielding behavior at the entries.

LOS Standards

The following LOS standards will be used for the Traffic Operations analysis:

- LOS D or better for I-5 ramp intersections.
- LOS D or better for S. Bonnyview/Bechelli and S. Bonnyview/Churn Creek. These two City intersections will have a LOS D standard due to the City's General Plan LOS D standard for "river crossings" and "interchanges".
- LOS C or better for Churn Creek/Alrose.

The City and Caltrans LOS policies and guidelines are quoted in the subsequent sections.

City General Plan Transportation Element LOS Policy

The City of Redding currently maintains its General Plan Transportation Element that is accessible via the following internet site: *http://www.cityofredding.org/home/showdocument?id=5513.* The Transportation Element contains the following information of particular interest to this study:

> *Policy T1A: Establish the following peak-hour LOS standards for transportation planning and project review. They reflect the special circumstances of various areas of the community:*
>
> - *Use LOS "C" – for most arterial streets and their intersections.*
> - *Use LOS "D" – for the Downtown area where vitality, activity, and pedestrian and transit use are primary goals.*
> - *Use LOS "D" – for streets within the State highway system and interchanges.*

- *Use LOS "D" – for river-crossing street corridors whose capacity is affected by adjacent intersections.*

Caltrans LOS Guidelines

The Caltrans published Guide for the Preparation of Traffic Impact Studies (dated December 2002) states the following:

> *"Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS."*

LOS Definitions

Table 2 presents the Highway Capacity Manual LOS definitions that will be used.

Table 2
LOS Definitions

Level of Service	Stopped Delay/Vehicle (sec)		
	Signalized	Un-Signalized	All-Way Stop
A	< 10.0	< 10.0	< 10.0
B	>10.0 and < 20.0	>10.0 and < 15.0	>10.0 and < 15.0
C	>20.0 and < 35.0	>15.0 and < 25.0	>15.0 and < 25.0
D	>35.0 and < 55.0	>25.0 and < 35.0	>25.0 and < 35.0
E	>55.0 and < 80.0	>35.0 and < 50.0	>35.0 and < 50.0
F	> 80.0	> 50.0	> 50.0

Vehicle Queue Standards

- Accommodate queues with "Detail 38" (aka "pocket") area.
- Omni-Means will give attention to lane utilization imbalances, short weaves and left turns in close proximity to a preceding intersection.

Next Steps

Traffic Operations

1. T. Ops. for Alt. 1 (traditional tight diamond).
   - For next meeting: Perform 2035 and 2045 analysis.
2. Geometric design for Alt. 1 (by Caltrans)
3. T. Ops. for Alt. 2 (DDI) & Alt. 3 (Roundabouts).
4. Geometric design for Alt. 2 (by Caltrans) and Alt. 3 (by Omni-Means).
5. Determine "hybrid" Alt. 4.
6. T. Ops. for Alt. 4.
7. Geometric design for Alt. 4 (by Caltrans and Omni-Means)

Agency Assignments

1. Rob Stinger and Dale Wider to verify District 2 management support for LOS standards identified above.

Information to Assist with Traffic Operations Analysis Review

Omni-Means will provide the following information with the T. Ops. summary for each alternative:

1. LOS tables.
2. Critical vehicle queue tables.
3. Conceptual layouts for mitigated conditions on aerial background.
4. Queue lengths shown graphically on the conceptual layouts.
5. Mitigated conditions conceptual layouts as backgrounds for simulations.

Technical Memorandum No. 8

To:	City of Redding - Engineering	**Date:**	November 22, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	T. Operations for Alternative 1 (Tight Diamond) and Alternative 3 (Roundabout Corridor) Year 2045	**Job No.:**	45-5721-27
		File No.:	C2174MEM008.DOCX
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Year 2045 AM and PM peak hour volumes were applied to Alternative 1 (Tight Diamond) and Alternative 3 (Roundabout Corridor) and mitigated lane geometrics developed.

Traffic Forecasts

Refer to Technical Memorandum No. 6.

Technical Parameters for Traffic Operations Analysis

Refer to Technical Memorandum No. 7.

Alternatives

Alternative 1 - Traditional Tight Diamond

The LOS/Delay and 95th percentile queue lengths for the AM and PM peak hours are presented in Tables 1 and 2.

Alternative 3 - Roundabout Corridor

The LOS/Delay and 95th percentile queue lengths for the AM and PM peak hours are presented in Tables 3 and 4.

Mitigated LOS and Delays

Alternative 1 - Traditional Tight Diamond

Year 2045 mitigated LOS and delays for Alternative 1 (Tight Diamond) is presented in Table 1.

Table 1: Year 2045 LOS and Delays for Alternative 1

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	C	27.4	C	30.9	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	21.2	C	22.3	C
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	24.1	C	26.1	C
4	S. Bonnyview Rd/Churn Creek Rd	Signal	C	27.8	C	26.8	C
5	Churn Creek Rd/Alrose Lane	TWSC	C	13.6	B	23.5	C

Notes:

1 TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

Year 2045 mitigated 95th percentile for Alternative 1 (Tight Diamond) is presented in Table 2. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.



Table 2: 95th Percentile Queue for Alternative 1

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	330	244	400
	Eastbound Thru		265	253	
	Eastbound Thru/Right		232	272	350
	Westbound Left		**156**	118	150
	Westbound Thru		436	423	
	Westbound Right		152	131	550
	Northbound Left/Thru		69	78	
	Northbound Right		46	65	75
	Southbound Left		60	233	300
	Southbound Left/Thru		90	295	
	Southbound Right		93	189	
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru	Signal	175	251	490
	Eastbound Right		108	330	350
	Westbound Left		152	197	300
	Westbound Thru		235	241	
	Southbound Left		124	130	300
	Southbound Left/Thru		130	148	
	Southbound Right		230	224	300
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left	Signal	247	420	
	Eastbound Thru		204	237	
	Westbound Thru		262	277	
	Westbound Right		257	213	
	Northbound Left		418	355	450
	Northbound Left/Thru		480	389	
	Northbound Right		266	189	400

Table 2: 95th Percentile Queue for Alternative 1 (Continued)

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**227**	**225**	175
	Eastbound Thru		141	217	
	Eastbound Right		89	93	145
	Westbound Left		97	60	
	Westbound Thru		256	232	
	Westbound Right		186	111	200
	Northbound Left		134	154	
	Northbound Thru/Right		135	59	
	Southbound Left		122	172	225
	Southbound Thru		44	30	
	Southbound Right		123	283	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left	TWSC	54	78	100
	Westbound Left/Thru		56	70	
	Westbound Thru/Right		104	27	
	Northbound Left/Thru/Right		-	50	
	Southbound Left/Thru		26	45	
	Southbound Right		79	73	

1. Worst lane movement (of the approach) value stated.

Alternative 3 - Roundabout Corridor

Year 2045 mitigated LOS and delays for Alternative 3 (Roundabout Corridor) is presented in Table 3.

Table 3: Year 2045 LOS and Delays for Alternative 3

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	C	11.8	B	23.6	C
2	S. Bonnyview Rd/I-5 SB Ramps	RNDBT	D	11.8	B	21.0	C
3	S. Bonnyview Rd/I-5 NB Ramps	RNDBT	D	8.4	A	9.8	A
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	C	11.3	B	12.2	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

Year 2045 mitigated 95th percentile for Alternative 3 (Roundabout Corridor) is presented in Table 4. In instances where there are more than two lanes for a particular movement/approach, queuing reported is

for the worse lane movement/approach. The queues are developed from the SIDRA version 7 using Highway Capacity Manual methodology.

Table 4: 95th Percentile Queue for Alternative 3

Int. #	Intersection/Approach	Control Type	Year 2045 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left/Thru	Roundabout	113.9	379.2	
	Eastbound Thru/Right		112.8	420.3	
	Westbound Left/Thru		237.5	195	
	Westbound Thru/Right		242	195	
	Northbound Left/Thru/Right		16	45.4	
	Southbound Left		22.2	95.8	
	Southbound Left/Thru		22.2	113.1	
	Southbound Right		35.7	114.8	
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru	Roundabout	128.6	493.1	
	Eastbound Right		71.3	480.5	500
	Westbound Left/Thru		0	0	
	Westbound Thru		0	0	
	Southbound Left/Thru		57.1	77.7	
	Southbound Right		233	184.5	400
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left/Thru	Roundabout	0	0	
	Eastbound Thru		0	0	
	Westbound Thru		84.8	139.2	
	Westbound Right		123.4	118.2	200
	Northbound Left		39.9	35.8	
	Northbound Left/Thru		39.9	35.8	
	Northbound Right		33.9	39.3	200
4	***S. Bonnyview Rd/Churn Creek Rd***		--	--	--
	Eastbound Left/Thru	Roundabout	89.2	119.4	
	Eastbound Thru/Right		93.1	125.5	
	Westbound Left/Thru		147.3	110.4	
	Westbound Thru/Right		162.4	118	
	Northbound Left/Thru/Right		65.7	45	
	Southbound Left/Thru		40.3	52.9	
	Southbound Right		117.7	183.4	

1. Worst lane movement (of the approach) value stated.

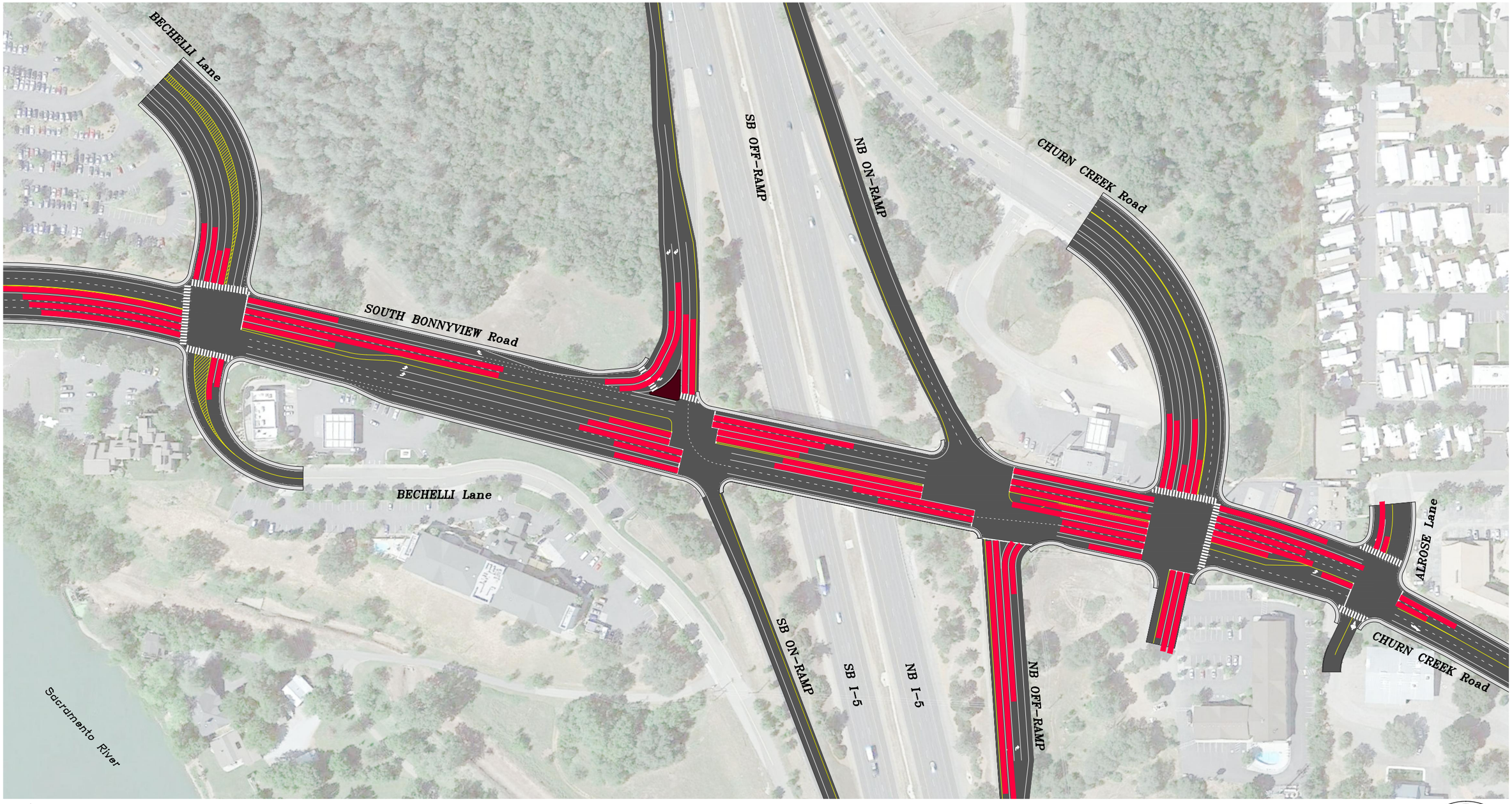
Attachments:

Attachment 1: Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 2: Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 3: Roundabout Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 4: Roundabout Lane Geometrics and 95th Percentile Queues for PM Peak Hour



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REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA
JOB NO. JOB_NO.

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 AM QUEUE LENGTHS
ALTERNATIVE 1 - TIGHT DIAMOND
REDDING, CALIFORNIA

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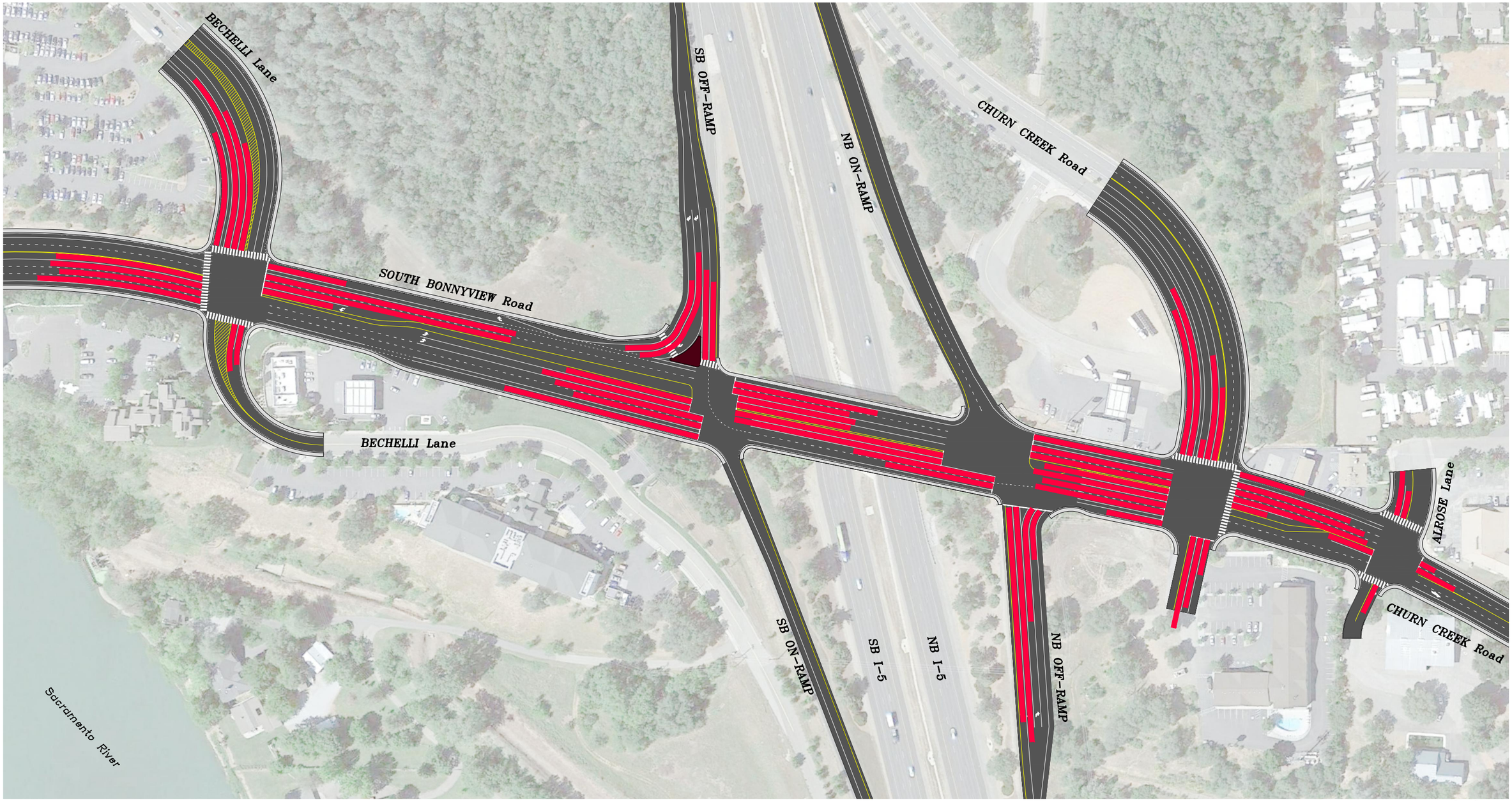

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I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 PM QUEUE LENGTHS
ALTERNATIVE 1 - TIGHT DIAMOND
REDDING, CALIFORNIA

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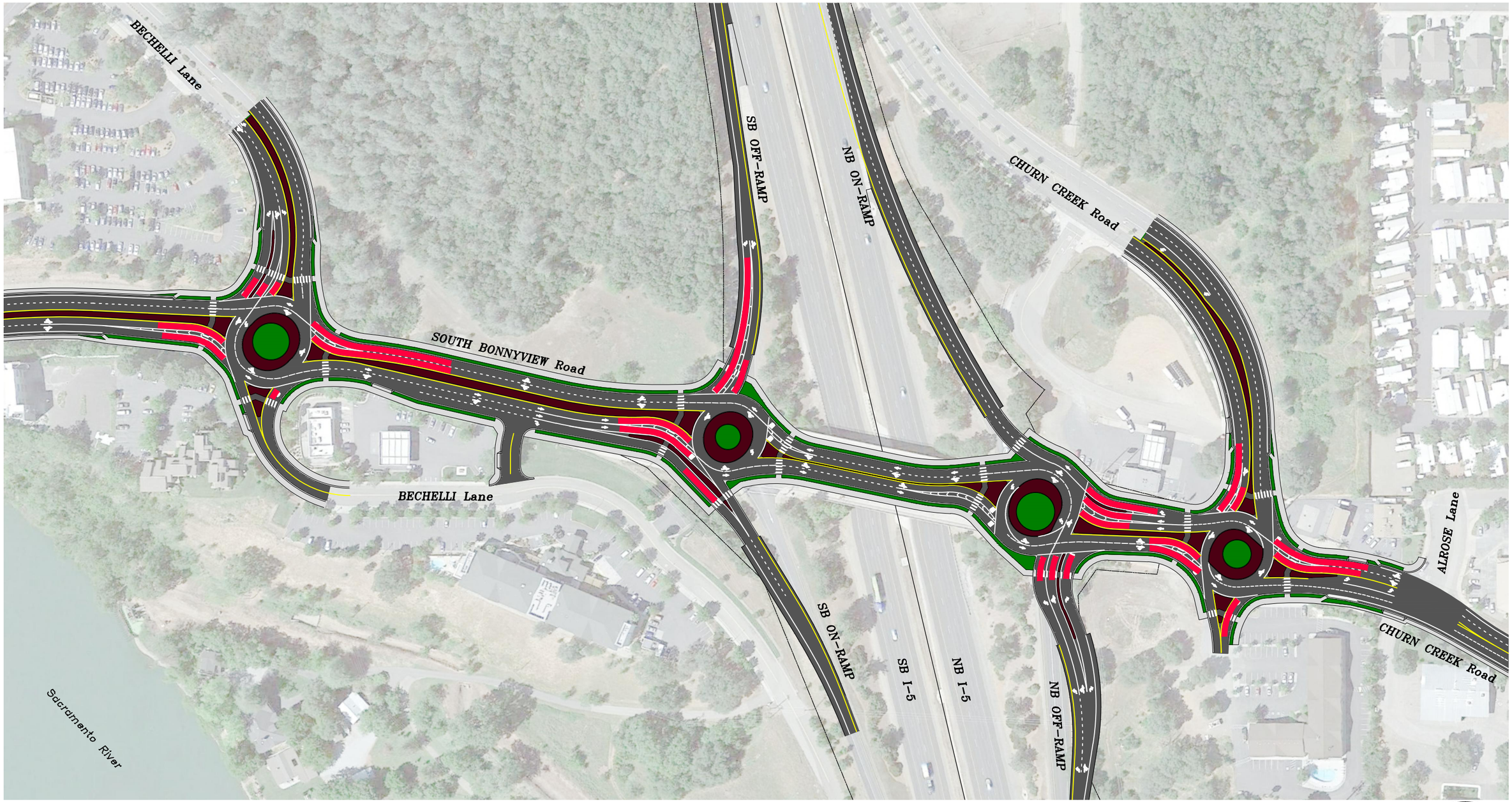

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JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 AM QUEUE LENGTHS
ALTERNATIVE 3 - ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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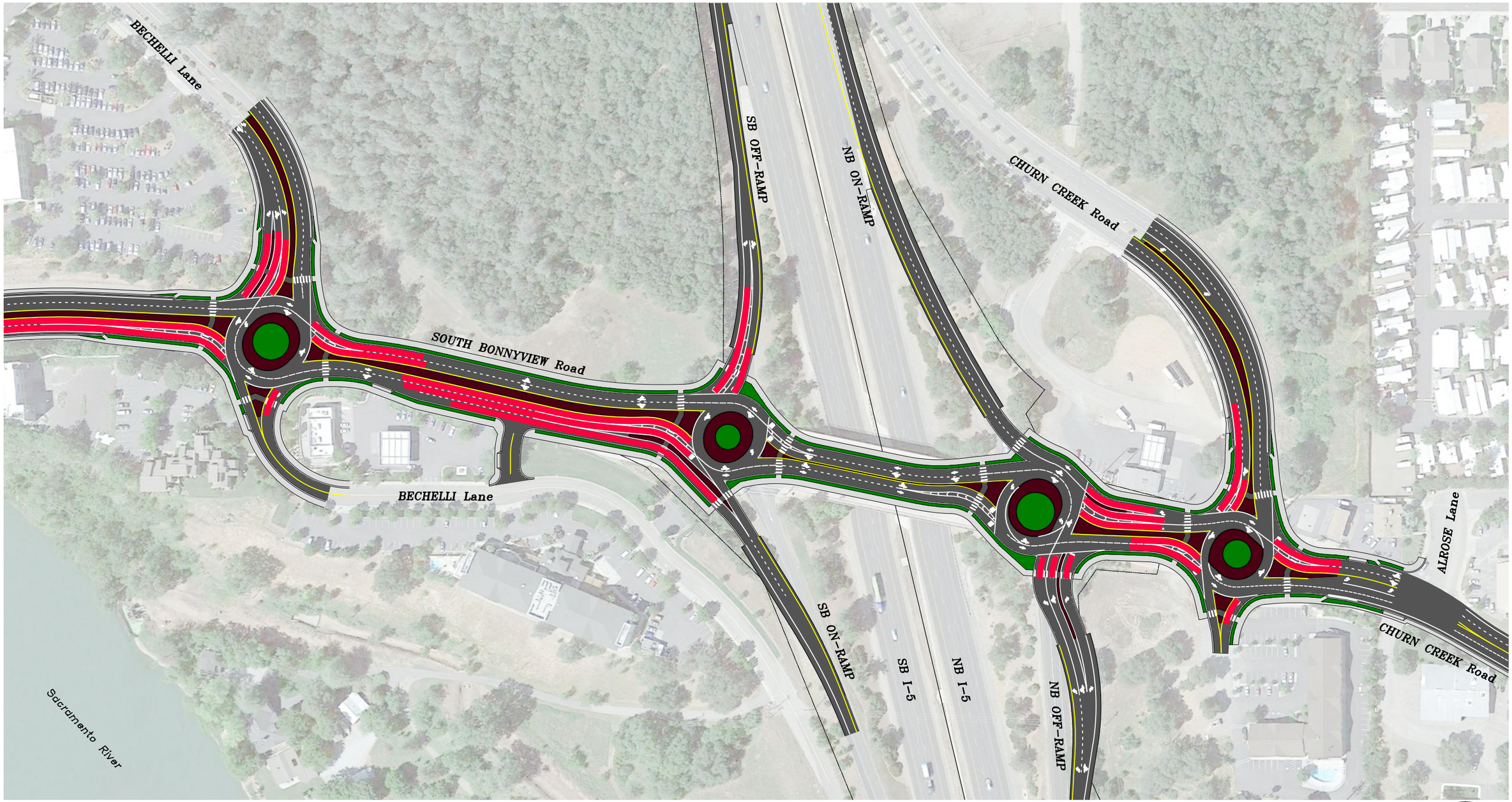

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JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 PM QUEUE LENGTHS
ALTERNATIVE 3 - ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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Technical Memorandum No. 9

To:	City of Redding - Engineering	**Date:**	November 22, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Year 2045 T. Operations for Alternative 2 (DDI)	**Job No.:**	45-5721-27
		File No.:	C2174MEM009
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Year 2045 AM and PM peak hour volumes were applied to Alternative 2 (Diverging Diamond Interchange [DDI]).

Traffic Forecasts

Refer to Technical Memorandum No. 6.

Technical Parameters for Traffic Operations Analysis

Refer to Technical Memorandum No. 7.

Alternative 2 – DDI Concept

The LOS/Delay and average and maximum queue lengths for the AM and PM peak hour are presented in Tables 1, 2, and 3.

Alternative 2 – DDI Concept

Year 2045 mitigated LOS and delays for Alternative 2 (DDI) are presented in Table 1.

Table 1: Year 2045 LOS and Delays for Alternative 2

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	15.8	B	23.9	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B	12.9	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.0	B	10.5	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	21.0	C	19.0	B

Year 2045 mitigated 95th percentile queues for Alternative 2 (DDI) are presented in Tables 2 and 3. In instances where there are more than two lanes for a particular movement/approach, queuing reported

is for the worse lane movement/approach. Queues were determining using VISSIM 8 micro simulation using car following and lane change methodology developed by Wiedermann and Sparmann.

Table 2: Queue for Alternative 2 - AM Peak Hour

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1] Average	Year 2045 Queue (ft) AM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	40.3	291.5	400
	Eastbound Thru/Right		17.7	217.2	
	Westbound Left/Thru/Right		62.4	412.8	550
	Northbound Left/Thru		6.4	86.1	100
	Northbound Right		4.6	85	100
	Southbound Left/Thru/Right		37.9	210.5	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru/Right	Signal	34.5	311.5	630
	Westbound Left/Thru		47.6	331	500
	Southbound Left		5.2	121.5	450
	Southbound Right		212.0	**556.6**	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left/Thru	Signal	25.1	293.9	480
	Westbound Thru/Right		50.1	**318.9**	215
	Northbound Left		9.2	141.7	450
	Northbound Right		176.0	224.1	450
4	***S. Bonnyview Rd/Churn Creek Rd***		--	--	--
	Eastbound Left	Signal	30.4	**339.9**	150
	Eastbound Thru		10.7	**228.5**	210
	Westbound Left		33.0	126.6	
	Westbound Thru		14.5	286.5	
	Northbound Left		7.4	165.9	
	Northbound Thru/Right		56.4	133.2	
	Southbound Left/Thru		18.9	109.8	225
	Southbound Right		17.0	251.2	350

1. Worst lane movement (of the approach) value stated.

Table 3: Queue for Alternative 2 - PM Peak Hour

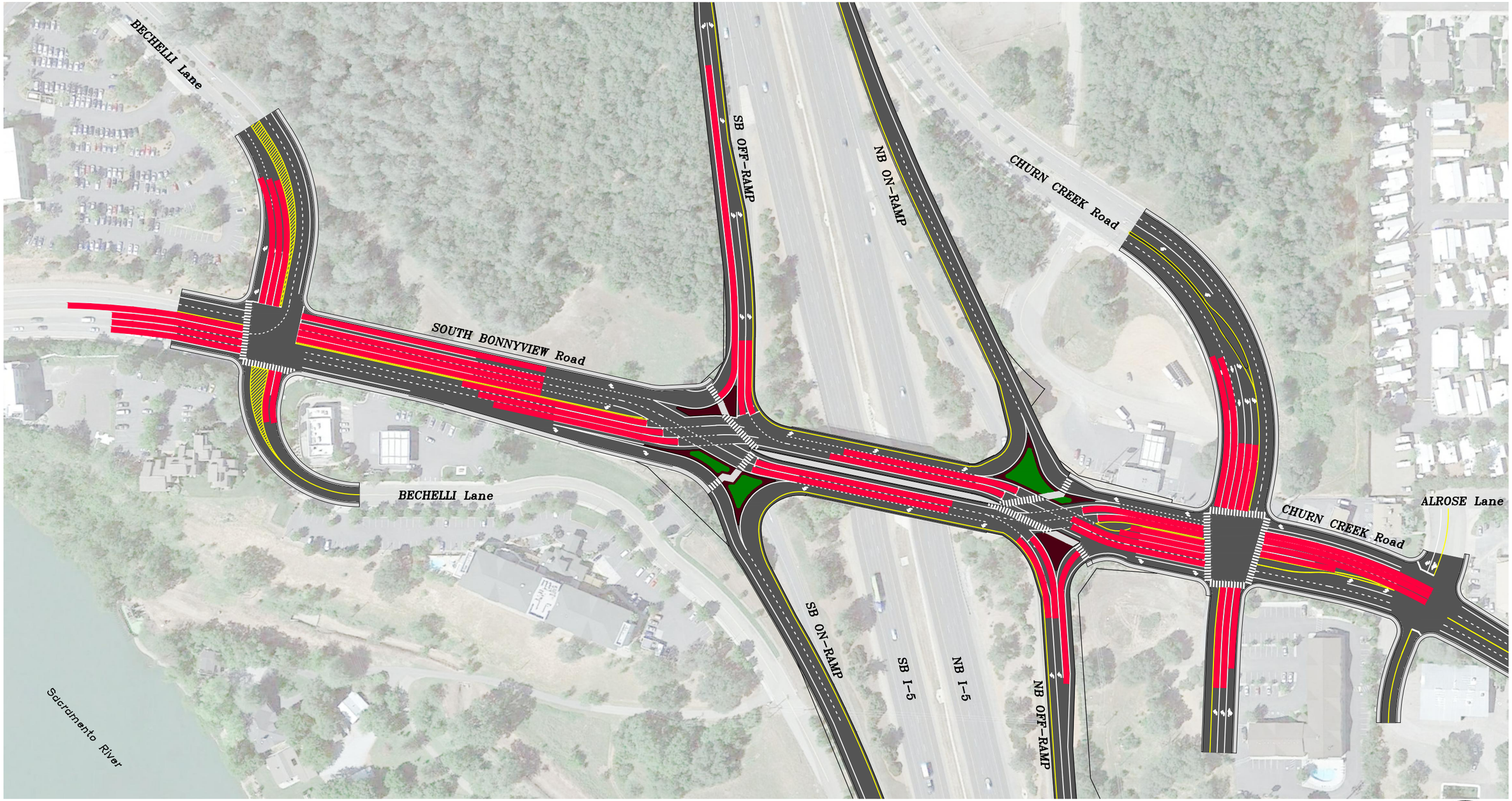
Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1] Average	Year 2045 Queue (ft) PM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	45.5	376.9	400
	Eastbound Thru/Right		30.4	255.6	
	Westbound Left/Thru/Right		71.0	444.3	550
	Northbound Left/Thru		7.9	86.1	100
	Northbound Right		8.2	85.1	100
	Southbound Left/Thru/Right		161.8	**480.9**	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru/Right	Signal	86.3	587.1	630
	Westbound Left/Thru		39.9	343.5	500
	Southbound Left		8.0	129.7	450
	Southbound Right		213.0	**468.2**	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left/Thru	Signal	40.5	**493.9**	480
	Westbound Thru/Right		47.9	307.3	450
	Northbound Left		6.5	118.5	450
	Northbound Right		18.3	156	400
Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) Average	Year 2045 Queue (ft) Max	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		--	--	--
	Eastbound Left	Signal	32.8	**298**	150
	Eastbound Thru		16.6	**285**	210
	Westbound Left		22.9	126.3	
	Westbound Thru		5.7	248.8	
	Northbound Left		7.9	128.2	
	Northbound Thru/Right		50.6	99.7	
	Southbound Left/Thru		22.7	148.7	225
	Southbound Right		22.2	289.5	350

1. Worst lane movement (of the approach) value stated.

Attachments:

Attachment 1: Diverging Diamond Interchange Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 2: Diverging Diamond Interchange Lane Geometrics and 95th Percentile Queues for PM Peak Hour



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YEAR 2045 AM QUEUE LENGTHS
ALTERNATIVE 2 - DDI & SIGNALS CONCEPT
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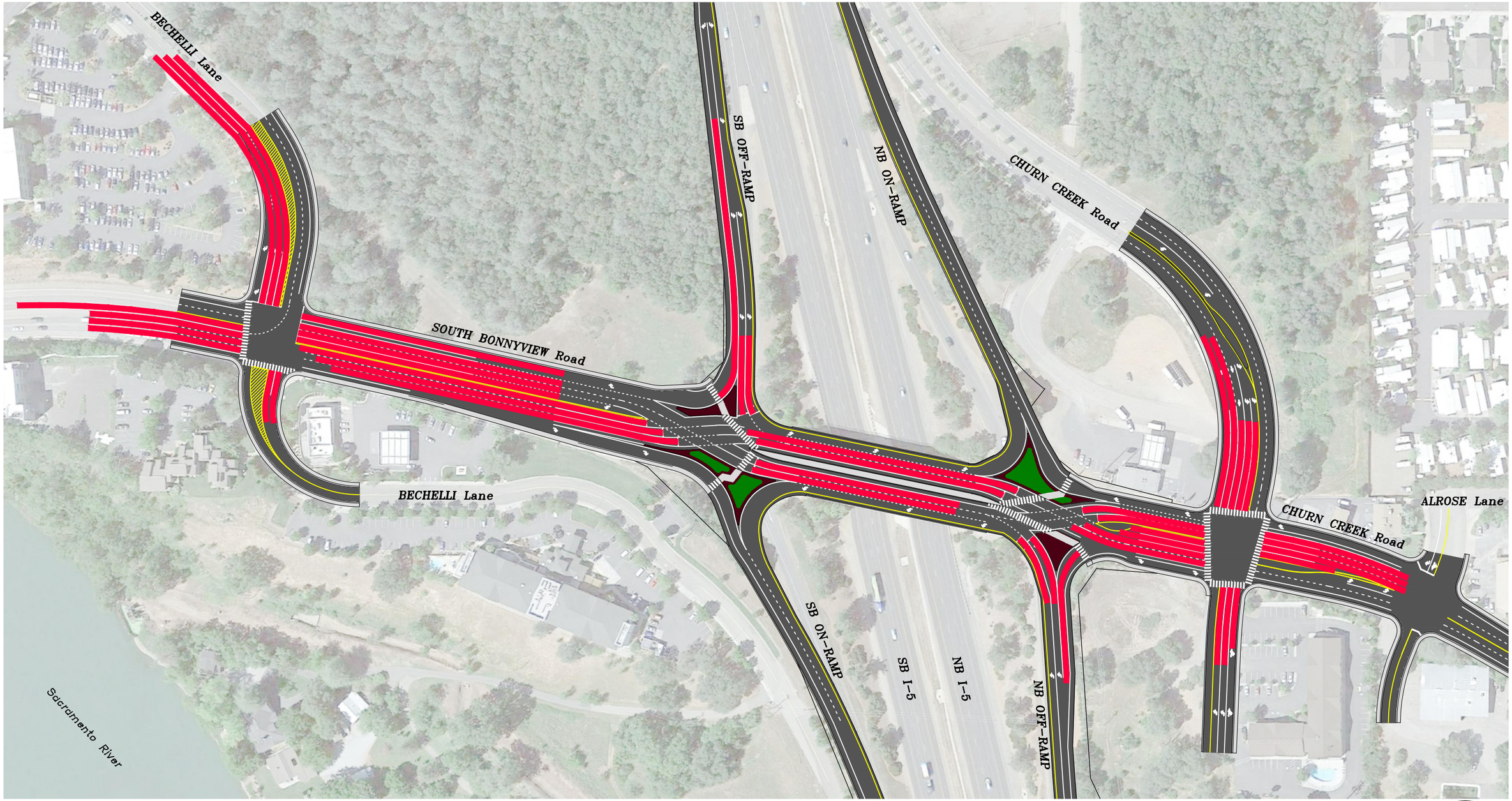

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Technical Memorandum No. 10

To:	City of Redding - Engineering	**Date:**	November 22, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Year 2045 T. Operations for Alternative 4 (DDI/Roundabout)	**Job No.:**	45-5721-27
		File No.:	C2174MEM010.DOCX
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Year 2045 AM and PM peak hour volumes were applied to Alternative 4 (Diverging Diamond Interchange [DDI]/Roundabouts).

Traffic Forecasts

Refer to Technical Memorandum No. 6.

Technical Parameters for Traffic Operations Analysis

Refer to Technical Memorandum No. 7.

Alternative 4 – DDI/Roundabouts Concept

The lane geometrics and average and maximum queue lengths for the critical PM peak hour is presented in Tables 1 and 2**.**

Alternative 4 – DDI/Roundabouts Concept

Year 2045 mitigated LOS and delays for Alternative 4 (DDI/Roundabouts) are presented in Table 1.

Table 1: Year 2045 LOS and Delays for Alternative 4

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	C	11.8	B	23.6	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B	12.9	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.0	B	10.5	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	C	11.3	B	12.2	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated average and maximum queues for Alternative 4 (DDI/Roundabouts) are presented in Tables 2 and 3. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues have been developed from SIDRA version 7 for the roundabouts and VISSIM 8 for the signalized intersection. SIDRA uses Highway Capacity Manual methodology while VISSIM employs micro simulation using car following and lane change methodology developed by Wiedermann and Sparmann respectively.



Table 2: Queue for Alternative 4 - AM Peak Hour

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1] Average	Year 2045 Queue (ft) AM Peak Hour[1] Max[2]	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		113.9	
	Eastbound Thru/Right			112.8	
	Westbound Left/Thru			237.5	
	Westbound Thru/Right			242	
	Northbound Left/Thru/Right			16	
	Southbound Left			22.2	
	Southbound Left/Thru			22.2	
	Southbound Right			35.7	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	20.5	104.2	630
	Westbound Left/Thru		54.6	273.5	500
	Southbound Left		5.8	84.5	450
	Southbound Right		36.6	**507.6**	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	65.9	209.6	480
	Westbound Thru/Right		28.4	**244.2**	215
	Northbound Left		10.6	118.1	450
	Northbound Right		3.0	102.5	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		89.2	
	Eastbound Thru/Right			93.1	
	Westbound Left/Thru			147.3	
	Westbound Thru/Right			162.4	
	Northbound Left/Thru/Right			65.7	
	Southbound Left/Thru			40.3	
	Southbound Right			117.7	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Table 3: Queue for Alternative 4 - PM Peak Hour

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1] Average	Year 2045 Queue (ft) PM Peak Hour[1] Max[2]	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		379.2	
	Eastbound Thru/Right			420.3	
	Westbound Left/Thru			195	
	Westbound Thru/Right			195	
	Northbound Left/Thru/Right			45.4	
	Southbound Left			95.8	
	Southbound Left/Thru			113.1	
	Southbound Right			114.8	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	24.7	170.9	630
	Westbound Left/Thru		51.6	278.7	500
	Southbound Left		6.8	119.3	450
	Southbound Right		29.7	412.8	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	70.0	397.1	480
	Westbound Thru/Right		29.4	**340.3**	215
	Northbound Left		8.5	123	450
	Northbound Right		6.6	175.6	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		119.4	
	Eastbound Thru/Right			125.5	
	Westbound Left/Thru			110.4	
	Westbound Thru/Right			118	
	Northbound Left/Thru/Right			45	
	Southbound Left/Thru			52.9	
	Southbound Right			183.4	

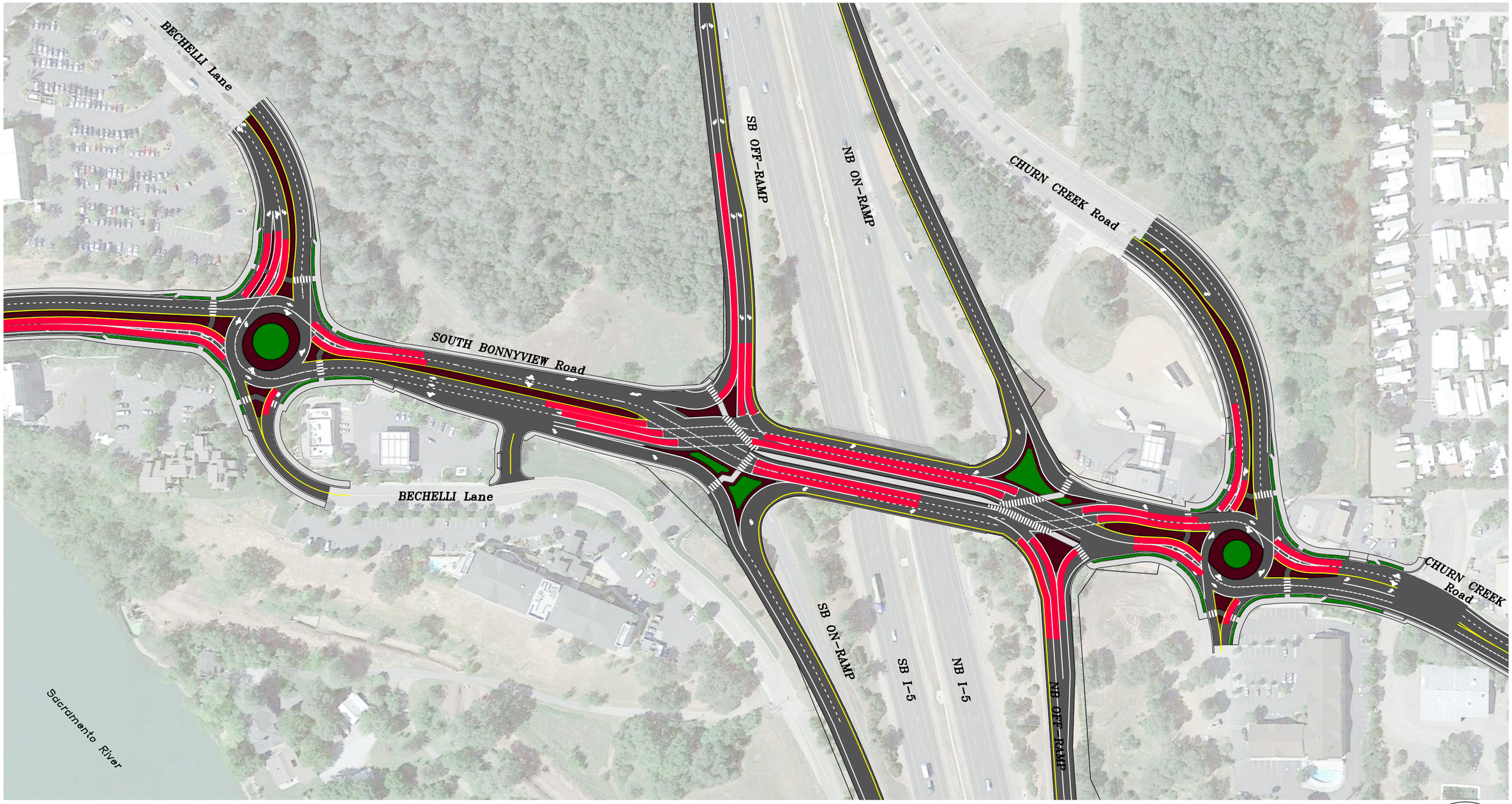
1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Attachments:

Attachment 1: Diverging Diamond Interchange/Roundabout Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 2: Diverging Diamond Interchange/Roundabout Lane Geometrics and 95th Percentile Queues for PM Peak Hour



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ALTERNATIVE 4 - DDI & ROUNDABOUT CONCEPT
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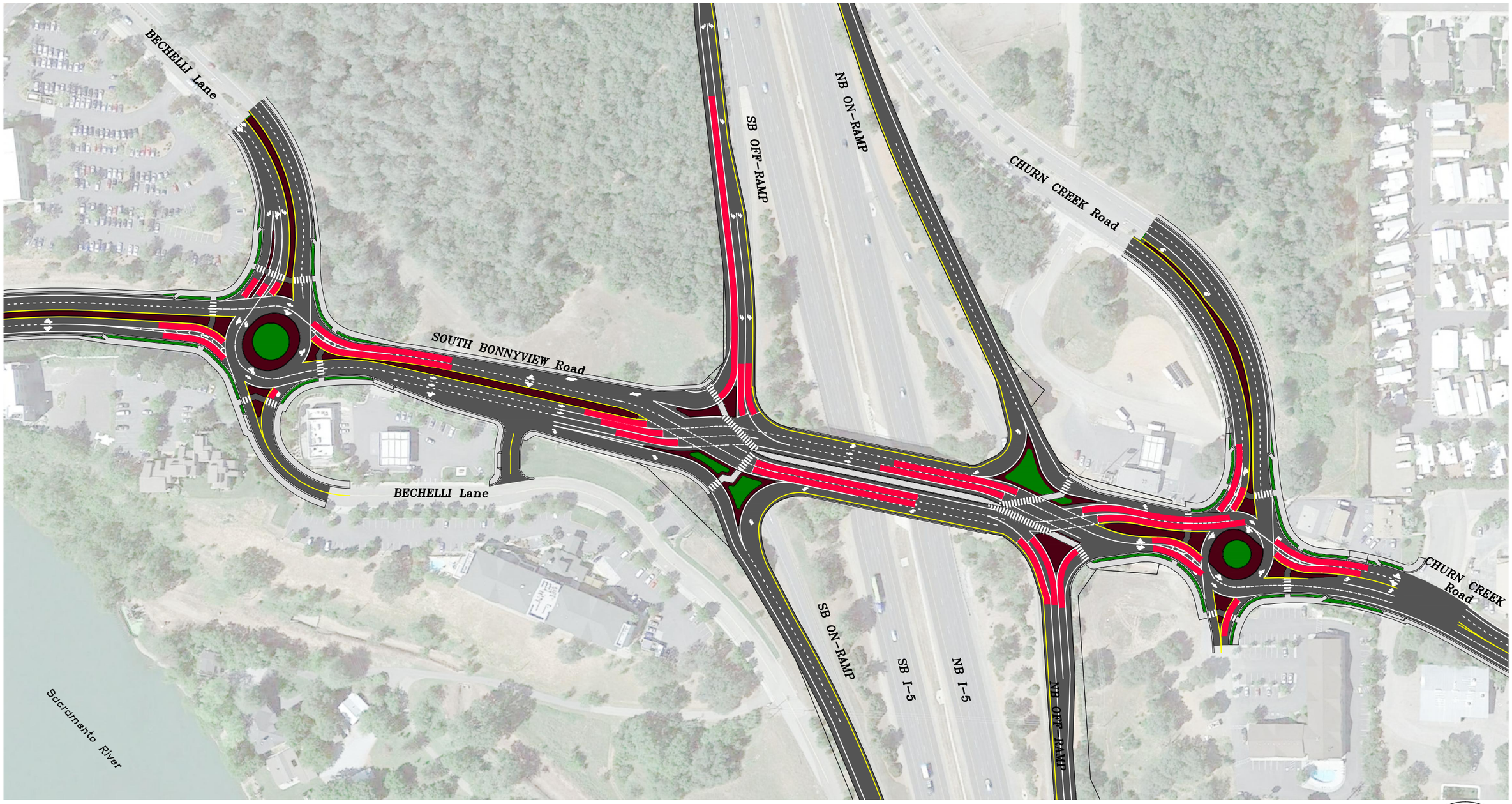

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Technical Memorandum No. 11 (Revised)

To:	City of Redding - Engineering	**Date:**	~~November 22, 2016~~ April 28, 2017
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Year 2035 T. Operations for Alt 1 (Tight Diamond), Alt 2 (DDI), Alt 3 (Roundabout Corridor), & Alt 4 (DDI/Roundabouts)	**Job No.:**	45-5721-27
		File No.:	C2174MEM011.DOCX
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Year 2035 AM and PM peak hour volumes were applied to Alternative 1 (Tight Diamond) Alternative 2 (Diverging Diamond Interchange [DDI]), Alternative 3 (Roundabout Corridor), and Alternative 4 (DDI/Roundabouts) and mitigated lane geometrics were developed.

Traffic Forecasts

Refer to Technical Memorandum No. 6.

Technical Parameters for Traffic Operations Analysis

Refer to Technical Memorandum No. 7.

Alternatives

Alternative 1 - Traditional Tight Diamond

The LOS/Delay and 95th percentile queue lengths for the AM and PM peak hours are presented in Tables 1 and 2**.**

Alternative 2 – DDI Interchange

The LOS/Delay and average and maximum queue lengths for the AM and PM peak hour are presented in Tables 3, 4 and 5**.**

Alternative 3 - Roundabout Corridor

The LOS/Delay and 95th percentile queue lengths for the AM and PM peak hours are presented in Tables 6 and 7**.**

Alternative 4 – DDI/Roundabouts Corridor

The LOS/Delay and average and maximum queue lengths for the AM and PM peak hour are presented in Tables 8, 9 and 10.

Mitigated LOS and Delays

Alternative 1 - Traditional Tight Diamond

Year 2035 mitigated LOS and delays for Alternative 1 (Tight Diamond) are presented in Table 1.

Table 1: Year 2035 LOS and Delays for Alternative 1

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.5	C	26.7	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	22.3	C	25.3	C
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	25.0	C	25.0	C
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	29.1	C	28.4	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	13.2	B	20.7	C

Notes:

1 TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

Year 2035 mitigated 95th percentile queues for Alternative 1 (Tight Diamond) are presented in Table 2. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.

Table 2: 95th Percentile Queue for Alternative 1

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft)[1]		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	277	211	400
	Eastbound Thru		224	227	
	Eastbound Thru/Right		200	243	350
	Westbound Left		109	78	150
	Westbound Thru		325	348	
	Westbound Right		132	133	550
	Northbound Left/Thru		62	81	
	Northbound Right		45	59	75
	Southbound Left		63	193	300
	Southbound Left/Thru		80	276	
	Southbound Right		87	157	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	155	226	490
	Eastbound Right		104	250	350
	Westbound Left		152	182	
	Westbound Thru		209	217	
	Southbound Left		111	140	300
	Southbound Left/Thru		107	144	
	Southbound Right		215	212	300
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	245	367	
	Eastbound Thru		172	209	
	Westbound Thru		259	276	
	Westbound Right		235	178	
	Northbound Left		278	255	450
	Northbound Left/Thru		320	294	
	Northbound Right		125	154	400

Table 2: 95th Percentile Queue for Alternative 1 (Continued)

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft)[1] AM Peak Hour	Year 2035 - 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**187**	**212**	175
	Eastbound Thru		123	218	
	Eastbound Right		82	92	145
	Westbound Left		88	57	
	Westbound Thru		225	212	
	Westbound Right		106	114	200
	Northbound Left		107	131	
	Northbound Thru/Right		108	68	
	Southbound Left		97	148	225
	Southbound Thru		45	31	
	Southbound Right		115	182	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left	TWSC	49	71	110
	Westbound Left/Thru		17	48	
	Westbound Thru/Right		12	18	
	Northbound Left/Thru/Right		-	42	
	Southbound Left/Thru		28	39	
	Southbound Right		71	60	

1. Worst lane movement (of the approach) value stated.

Alternative 2 – DDI Interchange

Year 2035 mitigated LOS and delays for Alternative 2 (DDI) are presented in Table 3.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 3: Year 2035 LOS and Delays for Alternative 2

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	32.2	C	22.9	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	11.7	B	12.2	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	10.2	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	21.0	C	18.6	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2035 mitigated average and maximum queues for Alternative 2 (DDI) are presented in Tables 4 and 5. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. Queues were determining using VISSIM which employs micro simulation using car following and lane change methodology developed by Wiedermann and Sparmann respectively.



Table 4: Queues for Alternative 2 - AM Peak Hour

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	52.9	244.4	400
	Eastbound Thru/Right		10.3	150.9	
	Westbound Left/Thru/Right		54.5	393.2	550
	Northbound Left/Thru		6.6	86.1	100
	Northbound Right		4.7	85	100
	Southbound Left/Thru/Right		39.0	197.2	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru/Right	Signal	19.1	208	630
	Westbound Left/Thru		42.2	324.5	500
	Southbound Left		4.7	105.4	450
	Southbound Right		222.0	420.8	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left/Thru	Signal	20.6	353.6	480
	Westbound Thru/Right		45.2	**303**	215
	Northbound Left		7.7	126.2	450
	Northbound Right		176.0	241.9	450
4	***S. Bonnyview Rd/Churn Creek Rd***		--	--	--
	Eastbound Left	Signal	22.7	**238.4**	150
	Eastbound Thru		8.2	145.4	210
	Westbound Left		26.8	127	
	Westbound Thru		21.0	238.9	
	Northbound Left		7.9	147.8	
	Northbound Thru/Right		50.5	237.7	
	Southbound Left/Thru		16.4	105.5	225
	Southbound Right		15.0	238.7	350

1. Worst lane movement (of the approach) value stated.

Table 5: 95th Percentile Queue for Alternative 2 - PM Peak Hour

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) PM Peak Hour[1] Average	Year 2035 Queue (ft) PM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	38.6	285.9	400
	Eastbound Thru/Right		27.8	256.6	
	Westbound Left/Thru/Right		62.1	421.5	550
	Northbound Left/Thru		7.5	86.1	100
	Northbound Right		6.6	85.1	100
	Southbound Left/Thru/Right		115.2	**465.3**	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru/Right	Signal	69.5	515.5	630
	Westbound Left/Thru		35.7	282.4	500
	Southbound Left		7.5	126.8	450
	Southbound Right		211.0	321.1	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left/Thru	Signal	34.7	367.8	480
	Westbound Thru/Right		40.6	**301.3**	200
	Northbound Left		5.5	106.1	450
	Northbound Right		176.0	224.1	450
4	***S. Bonnyview Rd/Churn Creek Rd***		--	--	--
	Eastbound Left	Signal	29.4	**305.5**	150
	Eastbound Thru		13.2	**253.4**	210
	Westbound Left		20.5	127.5	
	Westbound Thru		7.5	212.7	
	Northbound Left		7.6	128.1	
	Northbound Thru/Right		43.4	104.3	
	Southbound Left/Thru		21.5	151.9	225
	Southbound Right		17.9	280.9	350

1. Worst lane movement (of the approach) value stated.

Alternative 3 - Roundabout Corridor

Year 2035 mitigated LOS and delays for Alternative 3 (Roundabout Corridor) is presented in Table 6.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 6: Year 2035 LOS and Delays for Alternative 3

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	12.2	B	26.3	C
2	S. Bonnyview Rd/I-5 SB Ramps	RNDBT	D	10.6	B	16.9	B
3	S. Bonnyview Rd/I-5 NB Ramps	RNDBT	D	8.1	A	8.8	A
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	10.3	B	11.4	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2035 mitigated 95th percentile queues for Alternative 3 (Roundabout Corridor) are presented in Table 7. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the SIDRA version 7 using Highway Capacity Manual methodology.



Table 7: 95th Percentile Queue for Alternative 3

Int. #	Intersection/Approach	Control Type	Year 2035 95th Percentile Queue (ft)[1] AM Peak Hour	Year 2035 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout	129.5	465	
	Eastbound Thru/Right		128.5	500.2	
	Westbound Left/Thru		221.8	185.6	
	Westbound Thru/Right		226	183.2	
	Northbound Left/Thru/Right		16.8	36.2	
	Southbound Left		20.8	88.7	
	Southbound Left/Thru		20.8	101.2	
	Southbound Right		33.7	104.2	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Roundabout	109.9	357.4	
	Eastbound Right		63.8	309.1	500
	Westbound Left/Thru		0	0	
	Westbound Thru		0	0	
	Southbound Left/Thru		49.7	71.6	
	Southbound Right		181.1	170.8	400
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout	0	0	
	Eastbound Thru		0	0	
	Westbound Thru		76.3	111.8	
	Westbound Right		115.4	83.9	200
	Northbound Left		32.8	29.8	
	Northbound Left/Thru		32.8	29.8	
	Northbound Right		31.1	33.5	200
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout	77.1	113.1	
	Eastbound Thru/Right		79.7	118	
	Westbound Left/Thru		114.9	95	
	Westbound Thru/Right		122.5	99.9	
	Northbound Left/Thru/Right		61	46.1	
	Southbound Left/Thru		32.7	47.1	
	Southbound Right		111.1	156.7	

1. Worst lane movement (of the approach) value stated.

Alternative 4 – DDI/Roundabouts Corridor

Year 2035 mitigated LOS and delays for Alternative 4 (DDI/Roundabouts) is presented in Table 8.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 8: Year 2035 LOS and Delays for Alternative 4

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	12.2	B	26.3	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	11.7	B	12.2	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	10.2	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	10.3	B	11.4	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2035 mitigated average and maximum queues for Alternative 4 (DDI/Roundabouts) is presented in Table 9 and 10. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues have been developed from SIDRA version 7 for the roundabouts and VISSIM 8 for the signalized intersection. SIDRA uses Highway Capacity Manual methodology while VISSIM employs micro simulation using car following and lane change methodology developed by Wiedermann and Sparmann respectively.



Table 9: Queue for Alternative 4 - AM Peak Hour

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		129.5	
	Eastbound Thru/Right			128.5	
	Westbound Left/Thru			221.8	
	Westbound Thru/Right			226	
	Northbound Left/Thru/Right			16.8	
	Southbound Left			20.8	
	Southbound Left/Thru			20.8	
	Southbound Right			33.7	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	14.5	127.1	630
	Westbound Left/Thru		50.1	283.3	500
	Southbound Left		3.9	83.8	450
	Southbound Right		31.2	396.5	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	31.6	200	480
	Westbound Thru/Right		24.7	**280.9**	215
	Northbound Left		10.7	140.4	450
	Northbound Right		2.4	151.3	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		77.1	
	Eastbound Thru/Right			79.7	
	Westbound Left/Thru			114.9	
	Westbound Thru/Right			122.5	
	Northbound Left/Thru/Right			61	
	Southbound Left/Thru			32.7	
	Southbound Right			111.1	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Table 10: Queue for Alternative 4 - PM Peak Hour

Int. #	Intersection/Approach	Control Type	Year 2035 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		465	
	Eastbound Thru/Right			500.2	
	Westbound Left/Thru			185.6	
	Westbound Thru/Right			183.2	
	Northbound Left/Thru/Right			36.2	
	Southbound Left			88.7	
	Southbound Left/Thru			101.2	
	Southbound Right			104.2	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	21.6	154.3	630
	Westbound Left/Thru		46.6	277.8	500
	Southbound Left		6.4	103.4	450
	Southbound Right		25.3	313.3	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	59.7	315.4	480
	Westbound Thru/Right		25.6	**340.6**	215
	Northbound Left		7.5	141.2	450
	Northbound Right		5.9	193.1	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		113.1	
	Eastbound Thru/Right			118	
	Westbound Left/Thru			95	
	Westbound Thru/Right			99.9	
	Northbound Left/Thru/Right			46.1	
	Southbound Left/Thru			47.1	
	Southbound Right			156.7	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Attachments:

Attachment 1: Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 2: Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 3: Diverging Diamond Interchange Lane Geometrics and 95th Percentile Queues for AM Peak Hour

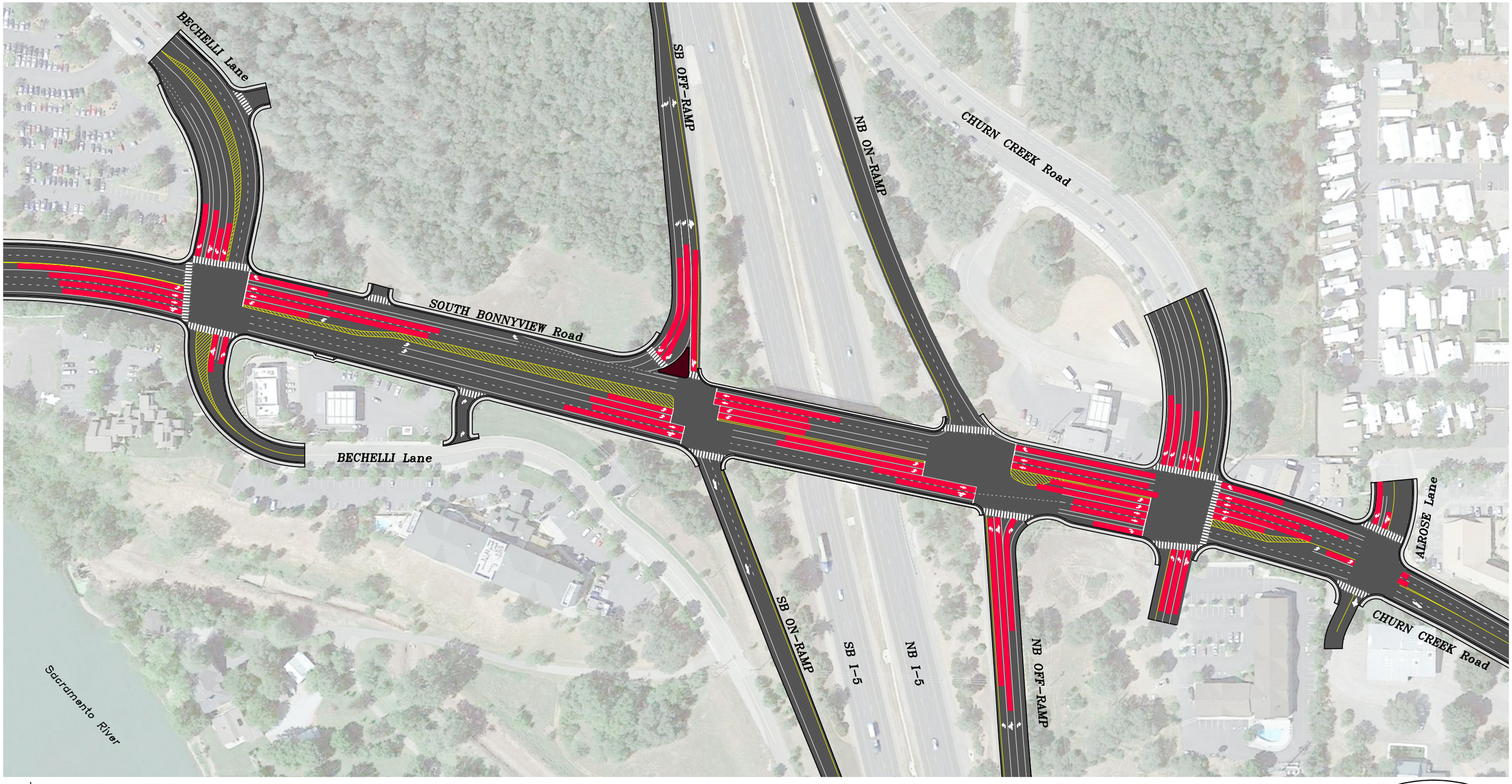
Attachment 4: Diverging Diamond Interchange Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 5: Roundabout Corridor Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 6: Roundabout Corridor Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 7: Diverging Diamond Interchange/Roundabout Corridor Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 8: Diverging Diamond Interchange/Roundabout Corridor Lane Geometrics and 95th Percentile Queues for PM Peak Hour



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ATTACHMENT 1

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YEAR 2035 AM QUEUE LENGTHS
ALTERNATIVE 1 - TIGHT DIAMOND
REDDING, CALIFORNIA

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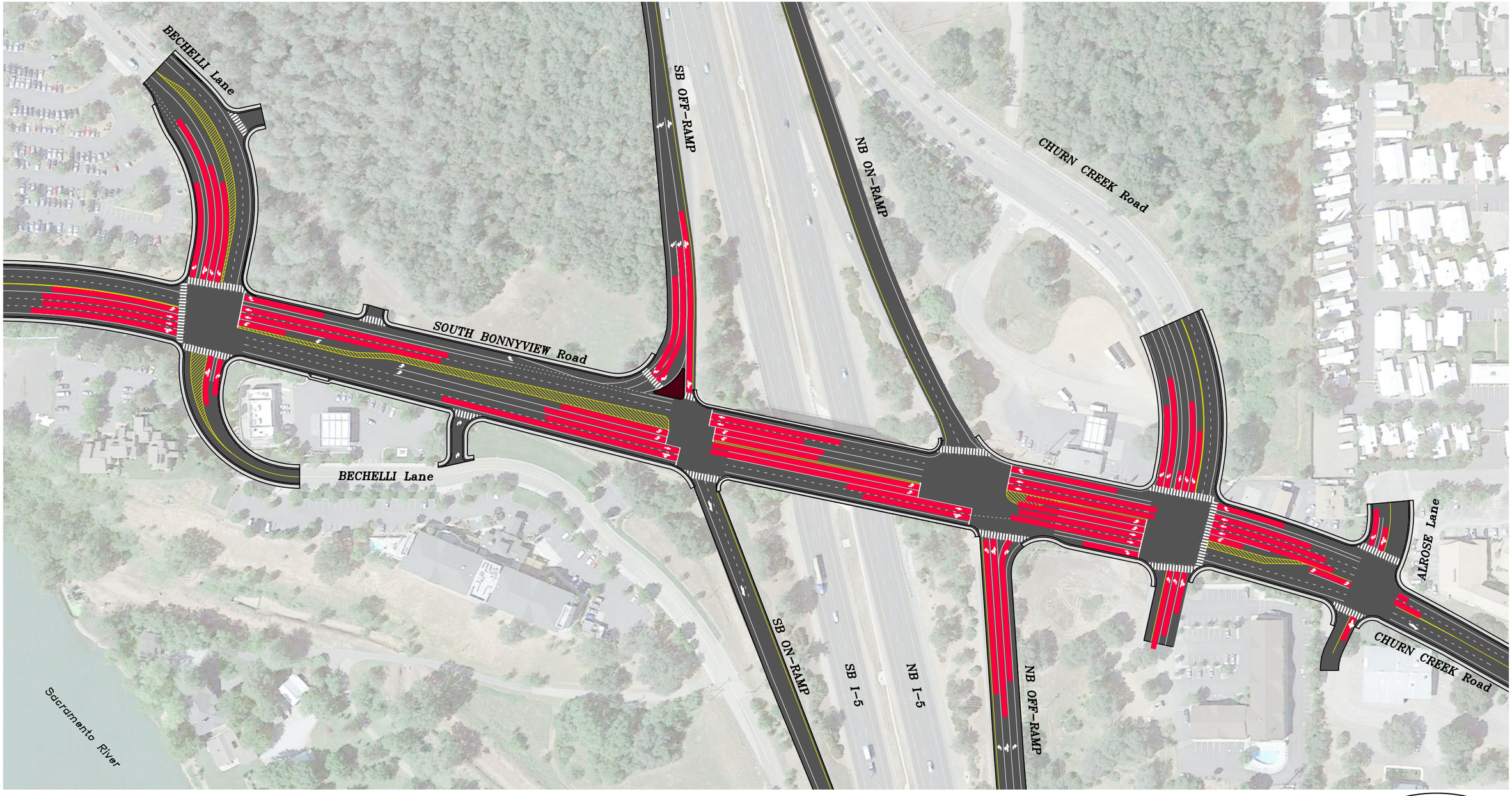

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ALTERNATIVE 1 - TIGHT DIAMOND
REDDING, CALIFORNIA

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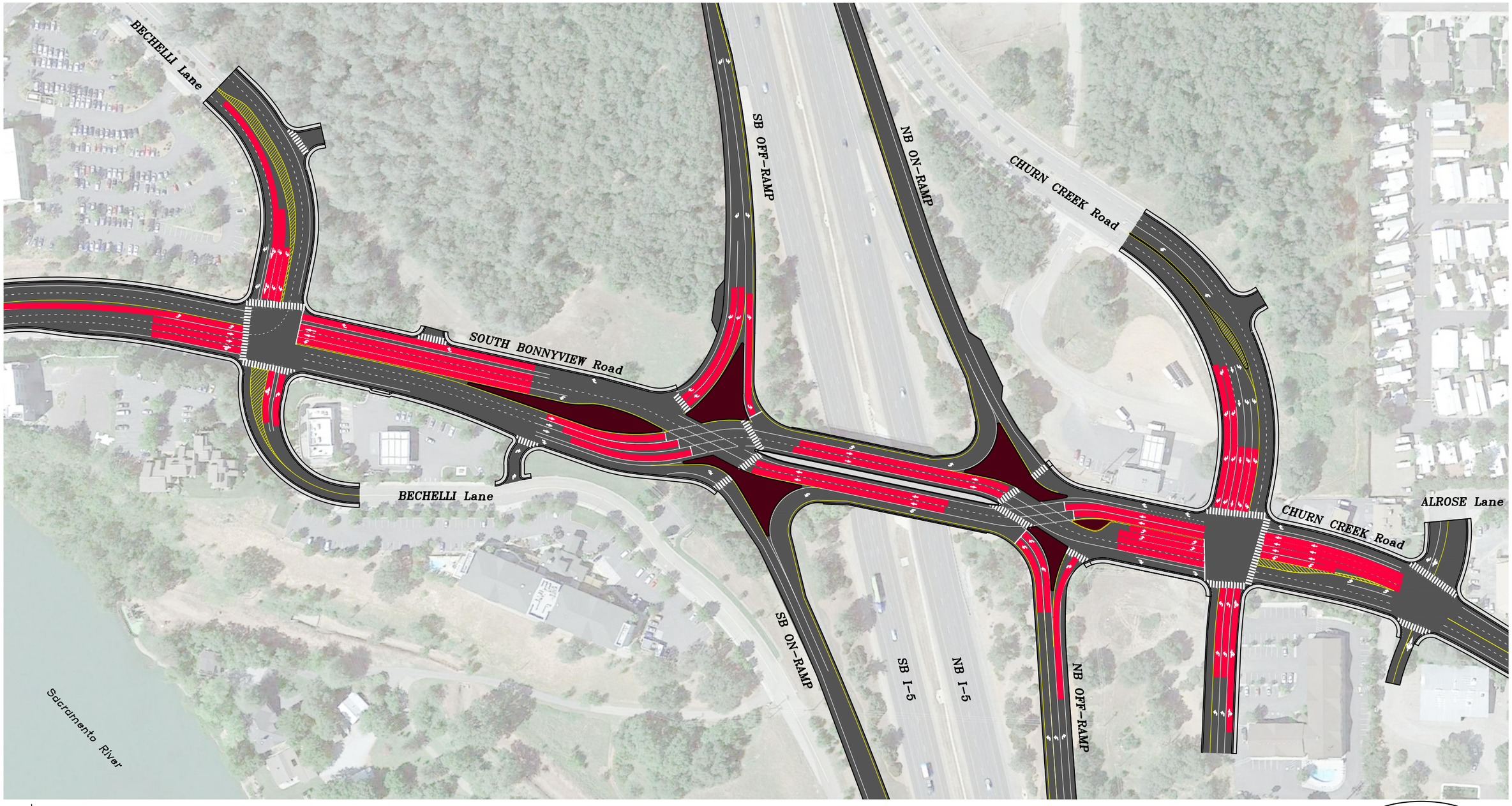

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 3

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YEAR 2035 AM QUEUE LENGTHS
ALTERNATIVE 2 - DDI & SIGNALS CONCEPT
REDDING, CALIFORNIA

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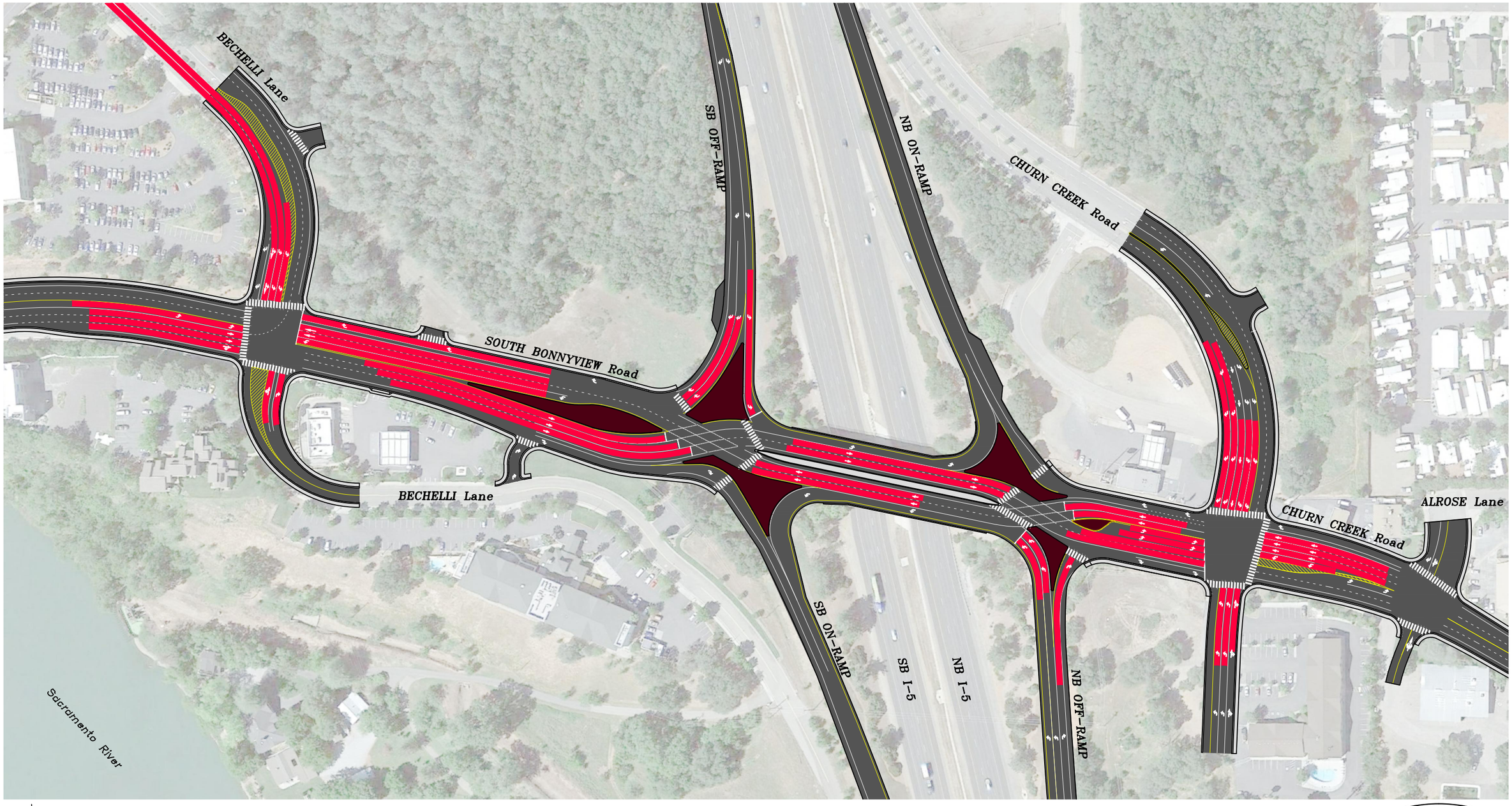

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 4

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ALTERNATIVE 2 - DDI & SIGNALS CONCEPT
REDDING, CALIFORNIA

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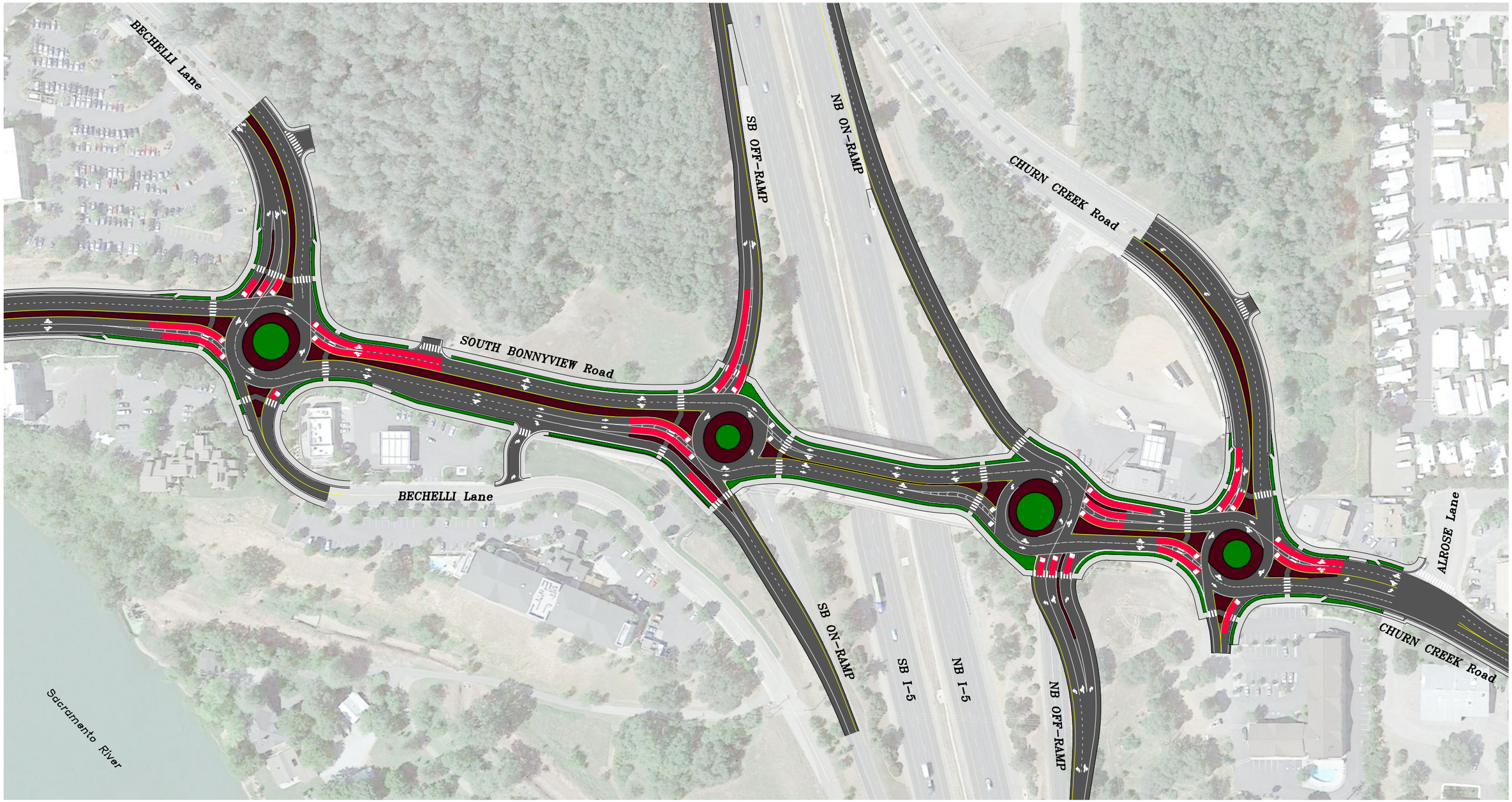

NOTE:
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ATTACHMENT 5

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YEAR 2035 AM QUEUE LENGTHS
ALTERNATIVE 3 - ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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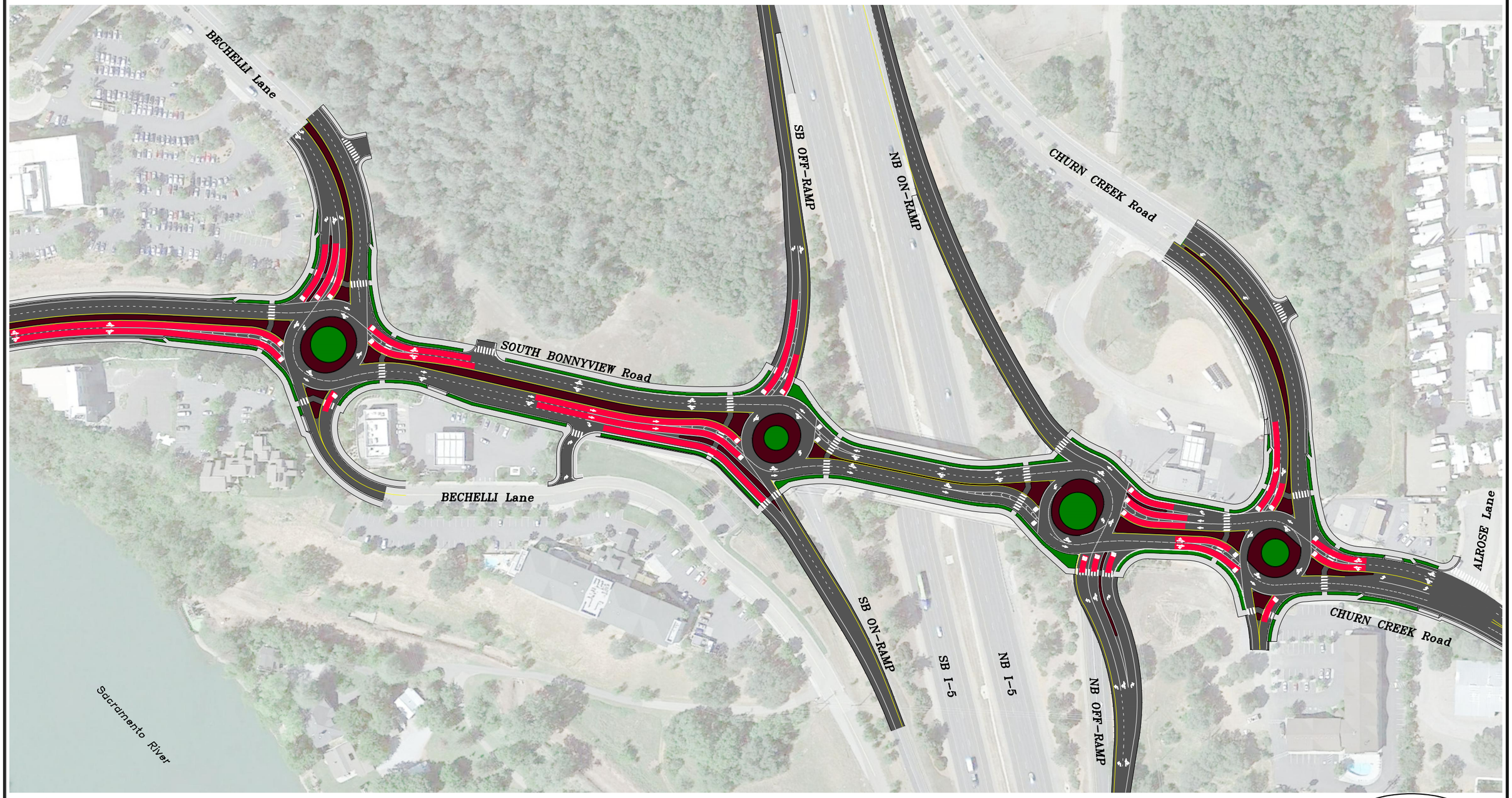

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 6

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YEAR 2035 PM QUEUE LENGTHS
ALTERNATIVE 3 - ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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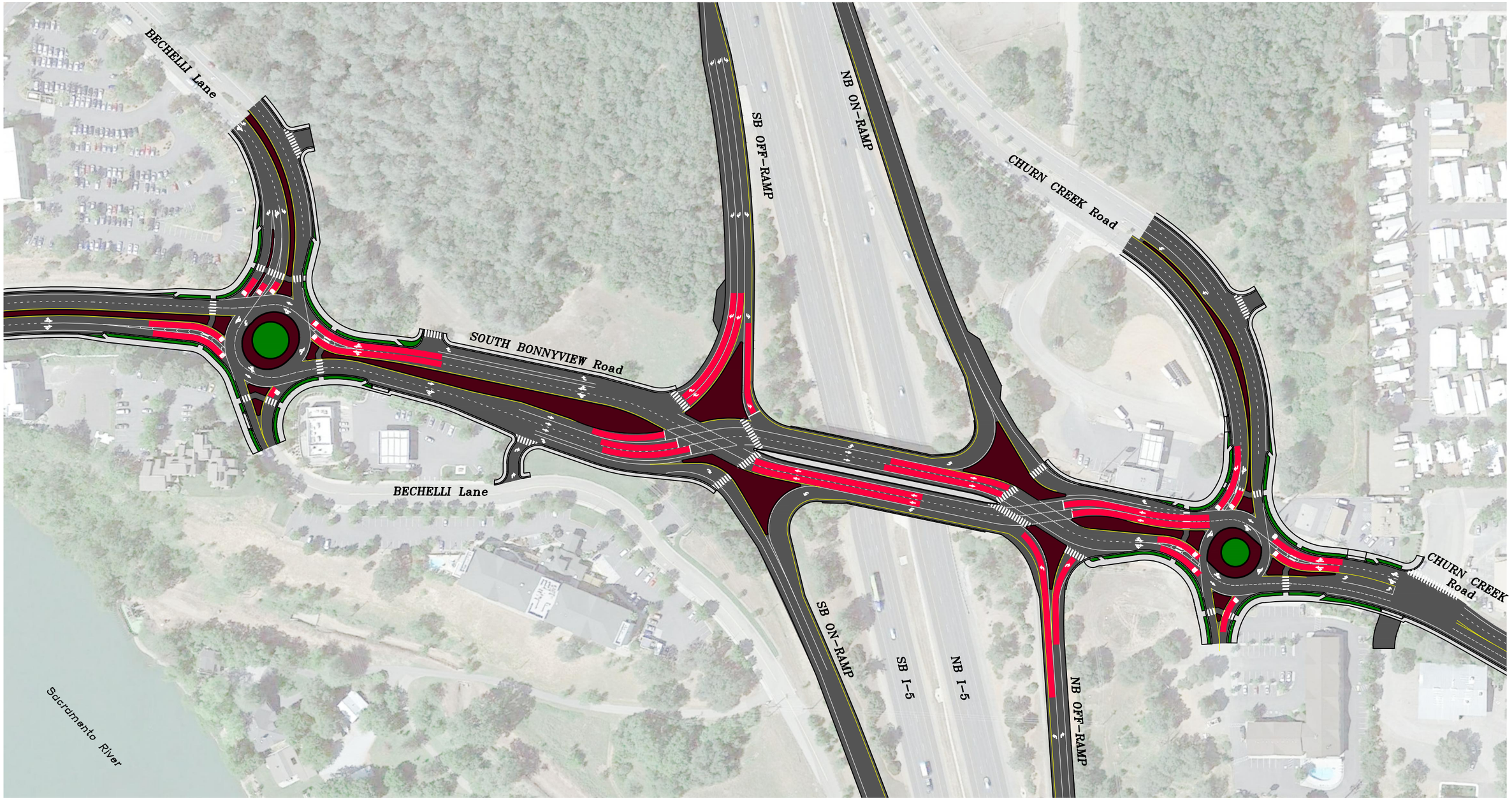

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 7

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ALTERNATIVE 4 - DDI & ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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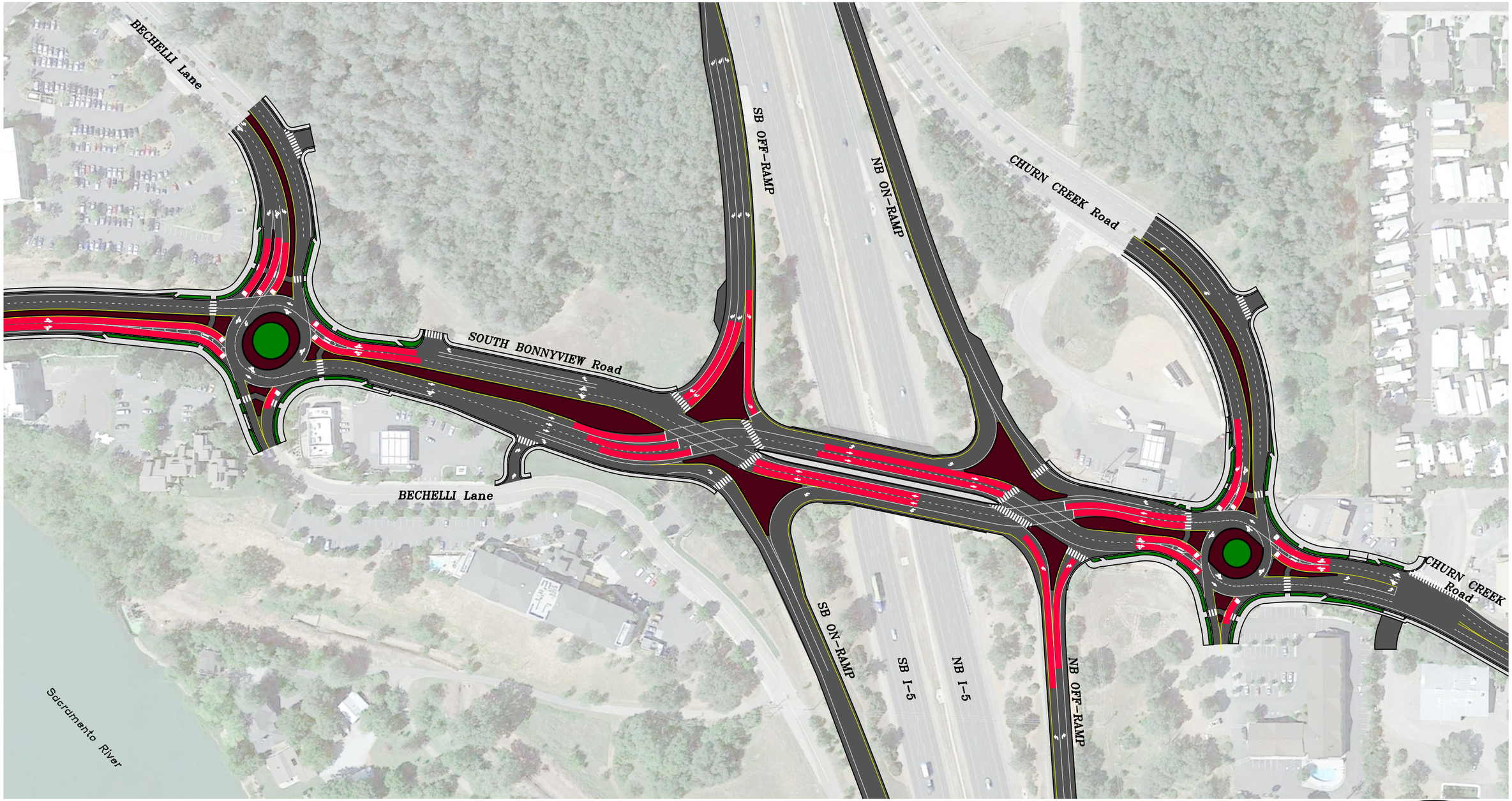

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 8

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YEAR 2035 PM QUEUE LENGTHS
ALTERNATIVE 4 - DDI & ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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Technical Memorandum No. 12

To:	City of Redding - Engineering	**Date:**	November 22, 2016
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	Travel Time Run Summaries for the various Alternatives	**Job No.:**	45-5721-27
		File No.:	C2174MEM012.DOCX
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

This memorandum presents the expected travel times in the EB and WB directions on South Bonnyview Road for the four alternatives. The travel time information is presented for Year 2035 and Year 2045 AM and PM peak hours.

Traffic Forecasts

Refer to Technical Memorandum No. 6.

Technical Parameters for Travel Time Analysis

Alternative 1 – Traditional Tight Diamond

The Synchro/Sim-Traffic model that was utilized to analyze the operations in terms of delay, LOS and queues for this alternative has the ability to output directional travel times. The travel times reported in subsequent tables were obtained from the Synchro/Simtraffic version 9.1 model.

Alternative 2 – DDI Interchange

The VISSIM model that was utilized to analyze the operations in terms of delay, LOS and queues for this alternative has the ability to output directional travel times. The travel times reported in subsequent tables were obtained from the VISSIM 8 model.

Alternative 3 –Roundabouts Corridor

Travel time is comprised of two principal components - the running time and the delay experienced by the through movements. In simplistic terms, the running time is the time that a motorist takes to reach from point A to point B.

The roundabout operations were analyzed in SIDRA that provides the delay experienced by SIDRA 7 for through movements.

For simplicity, the running time was obtained from the Synchro/Sim-Traffic 9.1 model.
The sum of the running time and through delay was utilized to estimate the travel time for Alternative 3.

Alternative 4 – DDI/Roundabouts Corridor

The VISSIM model that was utilized to analyze the operations in terms of delay, LOS and queues for this alternative has the ability to output directional travel times. The travel times reported in subsequent tables were obtained from the VISSIM 8 model.

Travel Times

Table 1 presents the expected Year 2035 AM and PM peak hours travel times (in seconds) on South Bonnyview Road in the EB and WB directions.

Table 1: Year 2035 Travel Times for Alternatives 1 through 4

	EB		WB	
Alternatives	AM Peak Hour (sec)	PM Peak Hour (sec)	AM Peak Hour (sec)	PM Peak Hour (sec)
Alternative 1	108.5	110.1	102.6	152.7
Alternative 2	85.7	94.5	131.3	137.8
Alternative 3	101.2	158.7	114	111.9
Alternative 4	87.4	100.2	102.4	102.6

Table 2 presents the expected Year 2045 AM and PM peak hours travel times (in seconds) on South Bonnyview Road in the EB and WB directions.

Table 2: Year 2045 Travel Times for Alternatives 1 through 4

	EB		WB	
Aternatives	AM Peak Hour (sec)	PM Peak Hour (sec)	AM Peak Hour (sec)	PM Peak Hour (sec)
Alternative 1	107.5	125.2	177.9	174.7
Alternative 2	88.5	99.3	136.8	136.7
Alternative 3	101.9	163.6	123.4	116.4
Alternative 4	91.9	107.6	105.1	104.7

Technical Memorandum No. 13

To:	City of Redding - Engineering	**Date:**	~~November 28, 2016~~ May 5, 2017
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	T. Operation for No Build Alternative in 2025, 2035 and 2045	**Job No.:**	45-5721-27
		File No.:	C2174MEM013.DOCX
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Year 2025, 2035, and 2045 AM and PM peak hour volumes were applied to the No Build Alternative with existing geometry to determine if conditions are acceptable.

Traffic Forecasts

Refer to Technical Memorandum No. 6.

Technical Parameters for Traffic Operations Analysis

Refer to Technical Memorandum No. 7.

Alternatives

No Build Alternative – Existing Geometry

The LOS/Delay and 95th percentile queue lengths for the AM and PM peak hours are presented in Tables 1-6**.**

LOS and Delays

Year 2025 LOS and delays for the No Build Alternative are presented in Table 1.

Table 1: Year 2025 LOS and Delays for the No Build Alternative

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	**S. Bonnyview Rd/Bechelli Lane**	**Signal**	**C**	20.5	C	**76.3**	**E**
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	30.2	C	45.2	D
3	**S. Bonnyview Rd/I-5 NB Ramps**	**Signal**	**D**	45.4	D	**64.9**	**E**
4	S. Bonnyview Rd/Churn Creek Rd	Signal	C	27.7	C	26.5	C
5	**Churn Creek Rd/Alrose Lane**	**TWSC**	**C**	16.8	C	**64.8**	**F**

Notes:

1 TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2025 95th percentile for the No Build Alternative is presented in Table 2. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.

Table 2: 2025 95th Percentile Queue for the No Build Alternative

Int. #	Intersection/Approach	Control Type	Year 2025 - 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	**259**	**333**	200
	Eastbound Thru		348	525	
	Eastbound Thru/Right		251	468	
	Westbound Left		52	42	145
	Westbound Thru		239	230	
	Westbound Right		130	128	200
	Northbound Left/Thru		60	71	
	Northbound Right		45	54	75
	Southbound Left		116	420	
	Southbound Left/Thru		82	439	
	Southbound Right		88	**273**	110
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	**418**	**918**	250
	Eastbound Right		100	**364**	250
	Westbound Left		183	199	380
	Westbound Thru		119	132	
	Southbound Left/Thru		319	518	
	Southbound Right		**324**	**521**	180
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	**466**	**421**	380
	Eastbound Thru		250	408	
	Westbound Thru		251	254	
	Westbound Right		**233**	**185**	110
	Northbound Left/Thru		338	286	
	Northbound Right		137	169	285

Int. #	Intersection/Approach	Control Type	Year 2025 - 95th Percentile Queue (ft) AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**205**	**276**	130
	Eastbound Thru		231	311	
	Eastbound Right		83	91	115
	Westbound Left		**100**	**78**	75
	Westbound Thru		206	214	
	Westbound Thru/Right		254	254	
	Northbound Left/Thru		206	215	
	Northbound Right		-	170	
	Southbound Left/Thru		580	590	
	Southbound Right		-	-	
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left/Thru/Right	TWSC	94	118	
	Westbound Left/Thru		68	12	
	Westbound Thru/Right		162	76	
	Northbound Left/Thru/Right		-	43	
	Southbound Left/Thru		38	54	
	Southbound Right		116	77	

1. Worst lane movement (of the approach) value stated.

Year 2035 LOS and delays for the No Build Alternative are presented in Table 3.

Table 3: Year 2035 LOS and Delays for the No Build Alternative

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	**S. Bonnyview Rd/Bechelli Lane**	**Signal**	**C**	22.3	C	**109.4**	**F**
2	**S. Bonnyview Rd/I-5 SB Ramps**	**Signal**	**D**	44.7	D	**55.9**	**E**
3	**S. Bonnyview Rd/I-5 NB Ramps**	**Signal**	**D**	**97.0**	**F**	**86.1**	**F**
4	S. Bonnyview Rd/Churn Creek Rd	Signal	C	28.6	C	28.0	C
5	**Churn Creek Rd/Alrose Lane**	**TWSC**	**C**	19.5	C	**101.0**	**F**

Notes:

1 TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2035 95th percentile for the No Build Alternative is presented in Table 4. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.

Table 4: 2035 95th Percentile Queue for the No Build Alternative

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	**342**	**415**	200
	Eastbound Thru		542	702	
	Eastbound Thru/Right		485	684	
	Westbound Left		71	62	145
	Westbound Thru		**246**	239	
	Westbound Right		145	133	200
	Northbound Left/Thru		78	99	
	Northbound Right		59	72	75
	Southbound Left		**181**	407	
	Southbound Left/Thru		124	437	
	Southbound Right		80	**281**	110
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	**856**	**948**	250
	Eastbound Right		250	**413**	250
	Westbound Left		183	231	380
	Westbound Thru		143	126	
	Southbound Left/Thru		605	502	
	Southbound Right		**476**	**549**	180
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	**456**	**416**	380
	Eastbound Thru		357	393	
	Westbound Thru		265	278	
	Westbound Right		**139**	**229**	110
	Northbound Left/Thru		401	336	
	Northbound Right		167	247	285

Int. #	Intersection/Approach	Control Type	Year 2035 - 95th Percentile Queue (ft) AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**232**	**254**	130
	Eastbound Thru		249	300	
	Eastbound Right		101	70	115
	Westbound Left		**100**	**83**	75
	Westbound Thru		219	214	
	Westbound Thru/Right		251	246	
	Northbound Left/Thru		230	194	
	Northbound Right		-	-	
	Southbound Left/Thru		587	587	
	Southbound Right		-	-	
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left/Thru/Right	TWSC	106	120	
	Westbound Left/Thru		93	71	
	Westbound Thru/Right		193	154	
	Northbound Left/Thru/Right		-	48	
	Southbound Left/Thru		67	87	
	Southbound Right		139	136	

1. Worst lane movement (of the approach) value stated.

Year 2045 LOS and delays for the No Build Alternative are presented in Table 5.

Table 5: Year 2045 LOS and Delays for the No Build Alternative

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour Delay	AM Peak Hour LOS	PM Peak Hour Delay	PM Peak Hour LOS
1	**S. Bonnyview Rd/Bechelli Lane**	**Signal**	**C**	24.5	C	**146.6**	**F**
2	**S. Bonnyview Rd/I-5 SB Ramps**	**Signal**	**D**	**64.4**	**E**	**65.5**	**E**
3	**S. Bonnyview Rd/I-5 NB Ramps**	**Signal**	**D**	**60.7**	**E**	**108.2**	**F**
4	**S. Bonnyview Rd/Churn Creek Rd**	**Signal**	**C**	31.5	C	**35.2**	**D**
5	**Churn Creek Rd/Alrose Lane**	**TWSC**	**C**	23.3	C	**176.3**	**F**

Notes:

1 TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 95th percentile for the No Build Alternative is presented in Table 6. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.

Table 6: 2045 95th Percentile Queue for the No Build Alternative

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	**377**	**398**	200
	Eastbound Thru		644	709	
	Eastbound Thru/Right		598	708	
	Westbound Left		87	71	145
	Westbound Thru		255	243	
	Westbound Right		149	152	200
	Northbound Left/Thru		72	106	
	Northbound Right		52	**91**	75
	Southbound Left		179	388	
	Southbound Left/Thru		152	403	
	Southbound Right		100	**286**	110
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	**923**	**947**	250
	Eastbound Right		**276**	**491**	250
	Westbound Left		202	208	380
	Westbound Thru		134	130	
	Southbound Left/Thru		610	496	
	Southbound Right		**523**	**553**	180
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	**451**	**429**	380
	Eastbound Thru		381	393	
	Westbound Thru		255	276	
	Westbound Right		**232**	**243**	110
	Northbound Left/Thru		513	309	
	Northbound Right		**340**	220	285

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft) AM Peak Hour	Year 2045 - 95th Percentile Queue (ft) PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	**244**	**260**	130
	Eastbound Thru		276	306	
	Eastbound Right		98	82	115
	Westbound Left		**107**	**82**	75
	Westbound Thru		225	228	
	Westbound Thru/Right		239	257	
	Northbound Left/Thru		234	218	
	Northbound Right		-	-	
	Southbound Left/Thru		585	579	
	Southbound Right		-	-	
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left/Thru/Right	TWSC	116	122	
	Westbound Left/Thru		141	102	
	Westbound Thru/Right		299	220	
	Northbound Left/Thru/Right		-	64	
	Southbound Left/Thru		140	117	
	Southbound Right		211	151	

1. Worst lane movement (of the approach) value stated.

Technical Memorandum No. 14

To:	City of Redding - Engineering	**Date:**	~~April 28, 2017~~ May 5, 2017
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	T. Operations for Alternative 1 **(Rev)** (Tight Diamond), Alternative 2 **(Rev)** (Diverging Diamond Interchange with Signals), and Alternative 4 **(Rev)** (Diverging Diamond with Roundabouts)	**Job No.:**	45-5721-27
		File No.:	C2174MEM014.DOCX
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

Upon reviewing the geometrics presented in Technical Memorandum Nos. 8, 9 and 10, the City/Caltrans focused PDT provided the following direction:

- Drop Alternate 3 (All Roundabouts) from further consideration due to the greater right of way impacts as compared to other alternatives.
- Alternatives 1, 2 and 4: Add the Churn Creek Marketplace Shopping Center and the proposed River Crossing Marketplace (Costco Site) driveways to the exhibits.
- Alternative 1:
  - Consider eliminating the EB right turn lane at the I-5 SB ramps intersection.
  - Consider reducing the I-5 SB off-ramp termini to 3 lanes.
  - Consider reducing the I-5 NB off-ramp termini to 3 lanes.
- Alternative 2:
  - No changes (with the exception of adding driveways to the exhibits).
- Alternative 4:
  - Consider reducing the NB departure from the Bechelli/S. Bonnyview roundabout intersection to 1 lane.
  - Consider reducing the NB departure from the S. Bonnyview/Churn Creek roundabout intersection to 1 lane.
  - Consider reducing the I-5 NB off-ramp termini to 2 lanes.

Year 2045 AM/PM peak hour volumes were applied to Alternative 1 (Tight Diamond) Alternative 2 (Diverging Diamond Interchange with Signals), and Alternative 4 (Diverging Diamond with Roundabouts) and updated LOS, delays, queues and exhibits are presented below.

All items identified above for consideration are incorporated into this Technical Memorandum No. 14.

Traffic Forecasts

No change. Refer to Technical Memorandum No. 6.

Technical Parameters for Traffic Operations Analysis

No change. Refer to Technical Memorandum No. 7.

LOS and Delays

Alternative 1 (Rev) - Traditional Tight Diamond

Year 2045 mitigated LOS and delays for Alternative 1 (Rev) (Tight Diamond) is presented in Table 1.

Table 1: Year 2045 LOS and Delays for Alternative 1 (Rev)

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.2	C	29.7	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	22.6	C	26.2	C
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	25.7	C	27.4	C
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	28.6	C	27.1	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	13.8	B	23.5	C

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 1 (Rev) (Tight Diamond) is presented in Table 2. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.



Table 2: 95th Percentile Queue for Alternative 1 (Rev)

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	475	306	400
	Eastbound Thru		406	266	
	Eastbound Thru/Right		229	223	350
	Westbound Left		128	138	150
	Westbound Thru		378	339	
	Westbound Right		154	129	550
	Northbound Left/Thru		70	87	
	Northbound Right		48	65	75
	Southbound Left		72	301	300
	Southbound Left/Thru		95	381	
	Southbound Right		96	263	
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru	Signal	205	662	490
	Eastbound Thru/Right		227	674	
	Westbound Left		143	201	300
	Westbound Thru		248	239	
	Southbound Left/Thru		231	255	
	Southbound Right		235	225	300
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left	Signal	335	481	
	Eastbound Thru		207	271	
	Westbound Thru		272	295	
	Westbound Right		255	235	
	Northbound Left		526	438	500
	Northbound Left/Thru		585	492	
	Northbound Right		416	308	500

Table 2: 95th Percentile Queue for Alternative 1 (Rev) (Continued)

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	Year 2045 - 95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	217	235	175
	Eastbound Thru		136	246	
	Eastbound Right		72	132	145
	Westbound Left		86	58	
	Westbound Thru		254	228	
	Westbound Right		164	128	200
	Northbound Left		137	112	
	Northbound Thru/Right		109	65	
	Southbound Left		125	171	225
	Southbound Thru		45	283	
	Southbound Right		105	229	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left	TWSC	46	80	100
	Westbound Left/Thru		16	70	
	Westbound Thru/Right		22	35	
	Northbound Left/Thru/Right		-	54	
	Southbound Left/Thru		24	46	
	Southbound Right		71	77	

1. Worst lane movement (of the approach) value stated.

Alternative 2 (Rev) - Diverging Diamond Interchange with Signals

Year 2045 mitigated LOS and delays for Alternative 2 (Rev) (Diverging Diamond Interchange with Signals) is presented in Table 3.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 3: Year 2045 LOS and Delays for Alternative 2 (Rev)

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	15.8	B	23.9	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B	12.9	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.0	B	10.5	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	21.0	C	19.0	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 2 (Rev) (Diverging Diamond Interchange with Signals) are presented in Tables 4 and 5. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the VISSIM version 8 using microsimulation.



Table 4: 95th Percentile AM Queue for Alternative 2 (Rev)

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1] Average	Year 2045 Queue (ft) AM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		--	--	--
	Eastbound Left	Signal	40.3	291.5	400
	Eastbound Thru/Right		17.7	217.2	
	Westbound Left/Thru/Right		62.4	412.8	550
	Northbound Left/Thru		6.4	86.1	100
	Northbound Right		4.6	85	100
	Southbound Left/Thru/Right		37.9	210.5	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		--	--	--
	Eastbound Thru/Right	Signal	34.5	311.5	630
	Westbound Left/Thru		47.6	331	500
	Southbound Left		5.2	121.5	450
	Southbound Right		212.0	278	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		--	--	--
	Eastbound Left/Thru	Signal	25.1	293.9	480
	Westbound Thru/Right		50.1	318.9	450
	Northbound Left		9.2	141.7	450
	Northbound Right		176.0	224.1	400
4	***S. Bonnyview Rd/Churn Creek Rd***		--	--	--
	Eastbound Left	Signal	30.4	339.9	150
	Eastbound Thru		10.7	228.5	210
	Westbound Left		33.0	126.6	
	Westbound Thru		14.5	286.5	
	Northbound Left		7.4	165.9	
	Northbound Thru/Right		56.4	133.2	
	Southbound Left/Thru		18.9	109.8	225
	Southbound Right		17.0	251.2	350

1. Worst lane movement (of the approach) value stated.

Table 5: 95th Percentile PM Queue for Alternative 2 (Rev)

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	45.5	376.9	400
	Eastbound Thru/Right		30.4	255.6	
	Westbound Left/Thru/Right		71.0	444.3	550
	Northbound Left/Thru		7.9	86.1	100
	Northbound Right		8.2	85.1	100
	Southbound Left/Thru/Right		161.8	480.9	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	86.3	587.1	630
	Westbound Left/Thru		39.9	343.5	500
	Southbound Left		8.0	260	450
	Southbound Right		213.0	233	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	40.5	493.9	480
	Westbound Thru/Right		47.9	307.3	450
	Northbound Left		6.5	118.5	450
	Northbound Right		18.3	156	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	32.8	298	150
	Eastbound Thru		16.6	285	210
	Westbound Left		22.9	126.3	
	Westbound Thru		5.7	248.8	
	Northbound Left		7.9	128.2	
	Northbound Thru/Right		50.6	99.7	
	Southbound Left/Thru		22.7	148.7	225
	Southbound Right		22.2	289.5	350

1. Worst lane movement (of the approach) value stated.

Alternative 4 (Rev) - Diverging Diamond Interchange with Roundabouts

Year 2045 mitigated LOS and delays for Alternative 4 (Rev) (Diverging Diamond Interchange with Roundabouts) is presented in Table 6.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 6: Year 2045 LOS and Delays for Alternative 4 (Rev)

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	11.8	B	23.6	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	11.8	B	11.9	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	12.0	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	11.3	B	12.2	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 4 (Rev) (Diverging Diamond Interchange with Roundabouts) are presented in Tables 7 and 8. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from a combination of Sidra version 7 using Highway Capacity Manual Methodology and VISSIM version 8 using microsimulation.



Table 7: 95th Percentile AM Queue for Alternative 4 (Rev)

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		113.9	
	Eastbound Thru/Right			112.8	
	Westbound Left/Thru			237.5	
	Westbound Thru/Right			242	
	Northbound Left/Thru/Right			16	
	Southbound Left			22.2	
	Southbound Left/Thru			22.2	
	Southbound Right			35.7	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	17.8	155	630
	Westbound Left/Thru		53.8	261.6	500
	Southbound Left		4.3	164	450
	Southbound Right		61.4	269	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	48.3	213.9	480
	Westbound Thru/Right		27.9	340.4	215
	Northbound Left		62.2	402.5	450
	Northbound Right		10.1	168.8	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		89.2	250
	Eastbound Thru/Right			93.1	250
	Westbound Left/Thru			147.3	
	Westbound Thru/Right			162.4	
	Northbound Left/Thru/Right			65.7	150
	Southbound Left/Thru			40.3	
	Southbound Right			117.7	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Table 8: 95th Percentile PM Queue for Alternative 4 (Rev)

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		379.2	
	Eastbound Thru/Right			420.3	
	Westbound Left/Thru			195	
	Westbound Thru/Right			195	
	Northbound Left/Thru/Right			45.4	
	Southbound Left			95.8	
	Southbound Left/Thru			113.1	
	Southbound Right			114.8	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	25.1	171	630
	Westbound Left/Thru		49.3	252	500
	Southbound Left		6.7	216	450
	Southbound Right		30.6	226	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	69.8	358.2	480
	Westbound Thru/Right		29.4	300	215
	Northbound Left		21.3	285.6	450
	Northbound Right		6.6	188.5	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		119.4	250
	Eastbound Thru/Right			125.5	250
	Westbound Left/Thru			110.4	
	Westbound Thru/Right			118	
	Northbound Left/Thru/Right			45	150
	Southbound Left/Thru			52.9	
	Southbound Right			183.4	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Attachments:

Attachment 1: Alternative 1 (Rev) - Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 2: Alternative 1 (Rev) - Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for PM Peak Hour

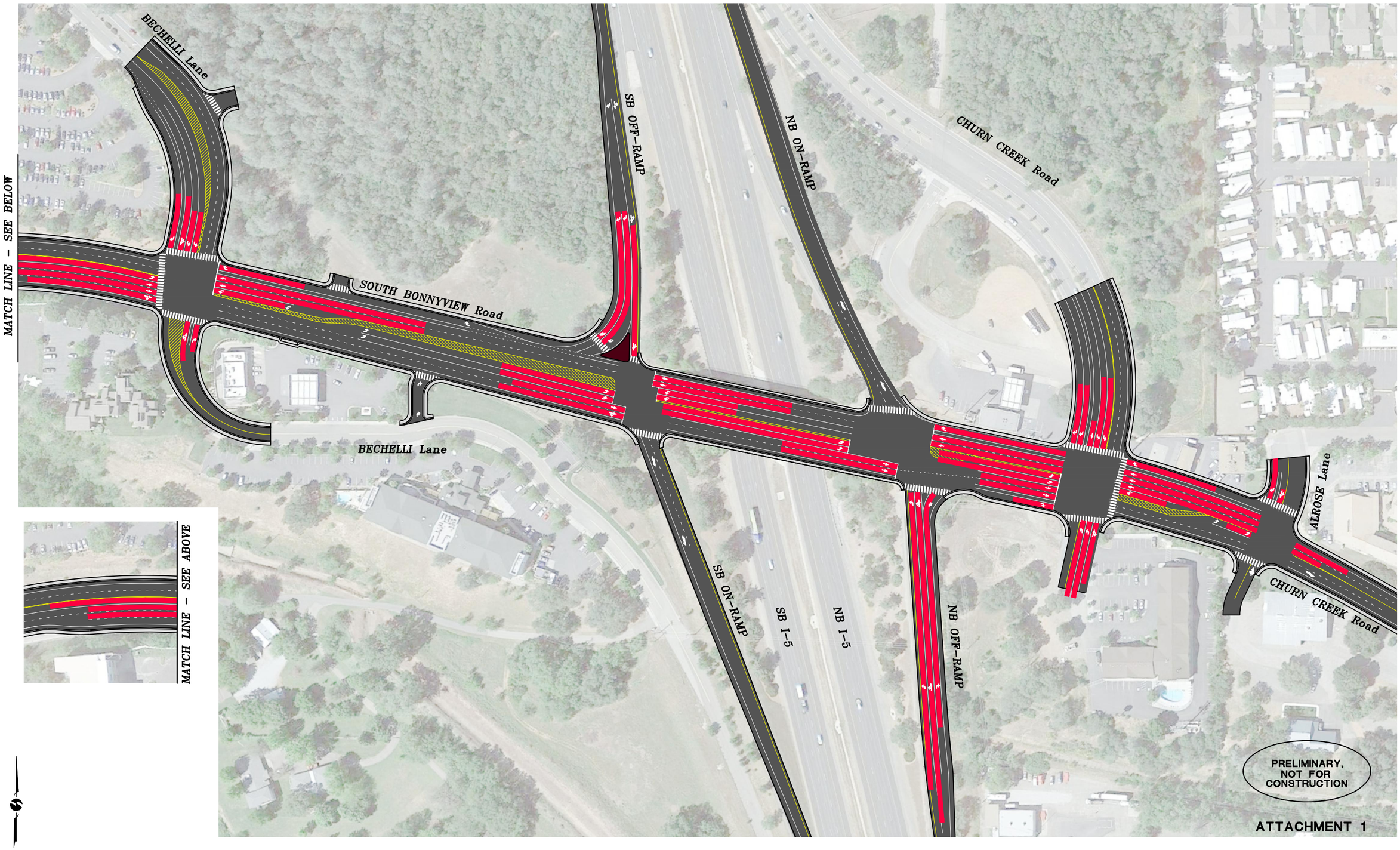
Attachment 3: Alternative 2 (Rev) - Diverging Diamond Interchange with Signals Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 4: Alternative 2 (Rev) - Diverging Diamond Interchange with Signals Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 5: Alternative 4 (Rev) - Diverging Diamond Interchange with Roundabouts Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 6: Alternative 4 (Rev) - Diverging Diamond Interchange with Roundabouts Lane Geometrics and 95th Percentile Queues for PM Peak Hour





ATTACHMENT 1

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NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
REDDING
330 Hartnell Ave, Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. JOB_NO.

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 AM QUEUE LENGTHS
REVISED ALTERNATIVE 1 - TIGHT DIAMOND
REDDING, CALIFORNIA

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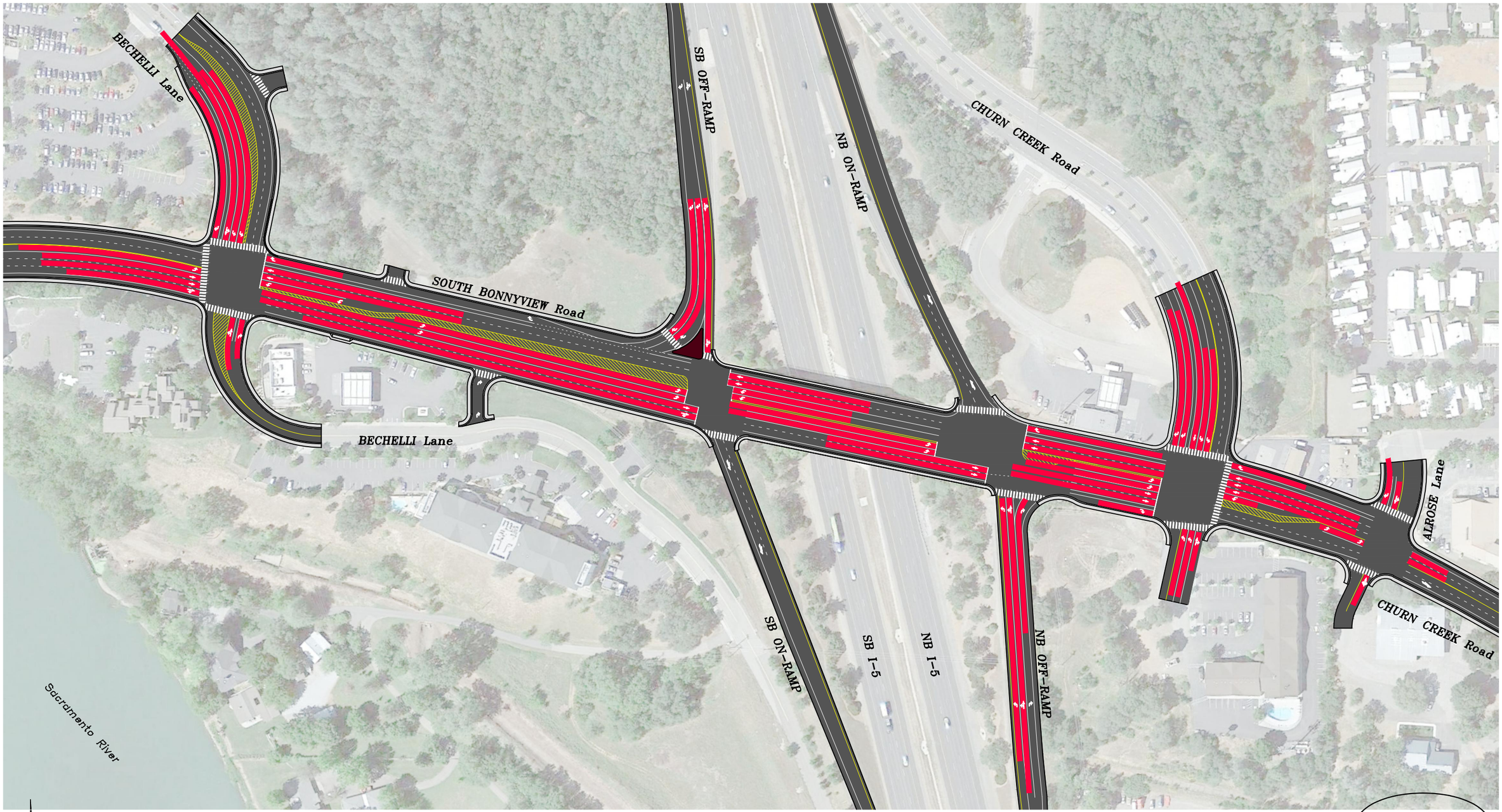

PRELIMINARY, NOT FOR CONSTRUCTION

ATTACHMENT 2

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1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA
JOB NO. JOB_NO.

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 PM QUEUE LENGTHS
REVISED ALTERNATIVE 1 - TIGHT DIAMOND
REDDING, CALIFORNIA

SCALE	1"=80'
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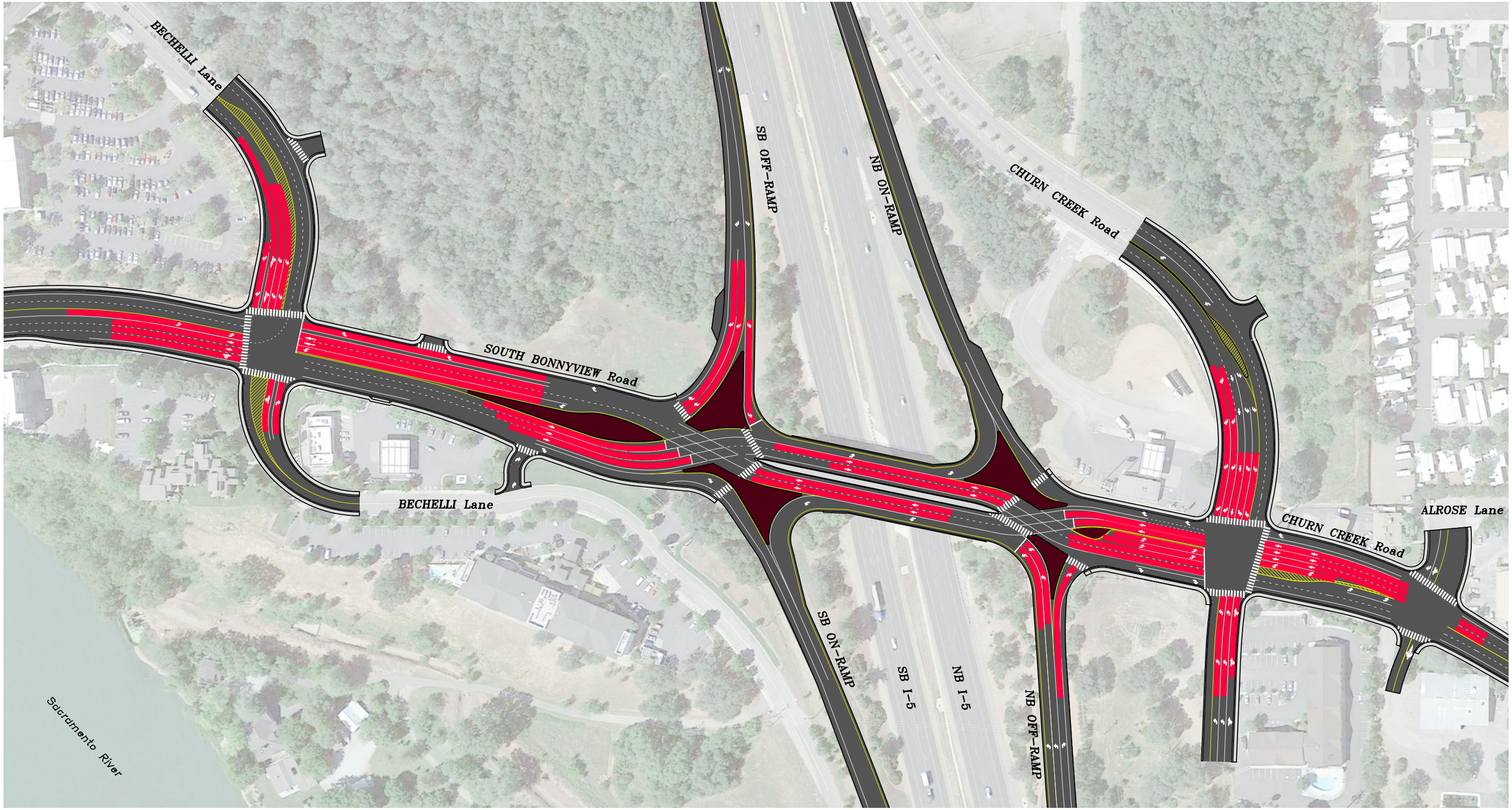

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE A).

PRELIMINARY, NOT FOR CONSTRUCTION

ATTACHMENT 3

REVISIONS			
NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 AM QUEUE LENGTHS
REVISED ALTERNATIVE 2 - DDI & SIGNALS CONCEPT
REDDING, CALIFORNIA

SCALE	1"=80'
DESIGNED	MES
DRAWN	MES
CHECKED	RAW
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DATE	04/28/17

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1 OF 1

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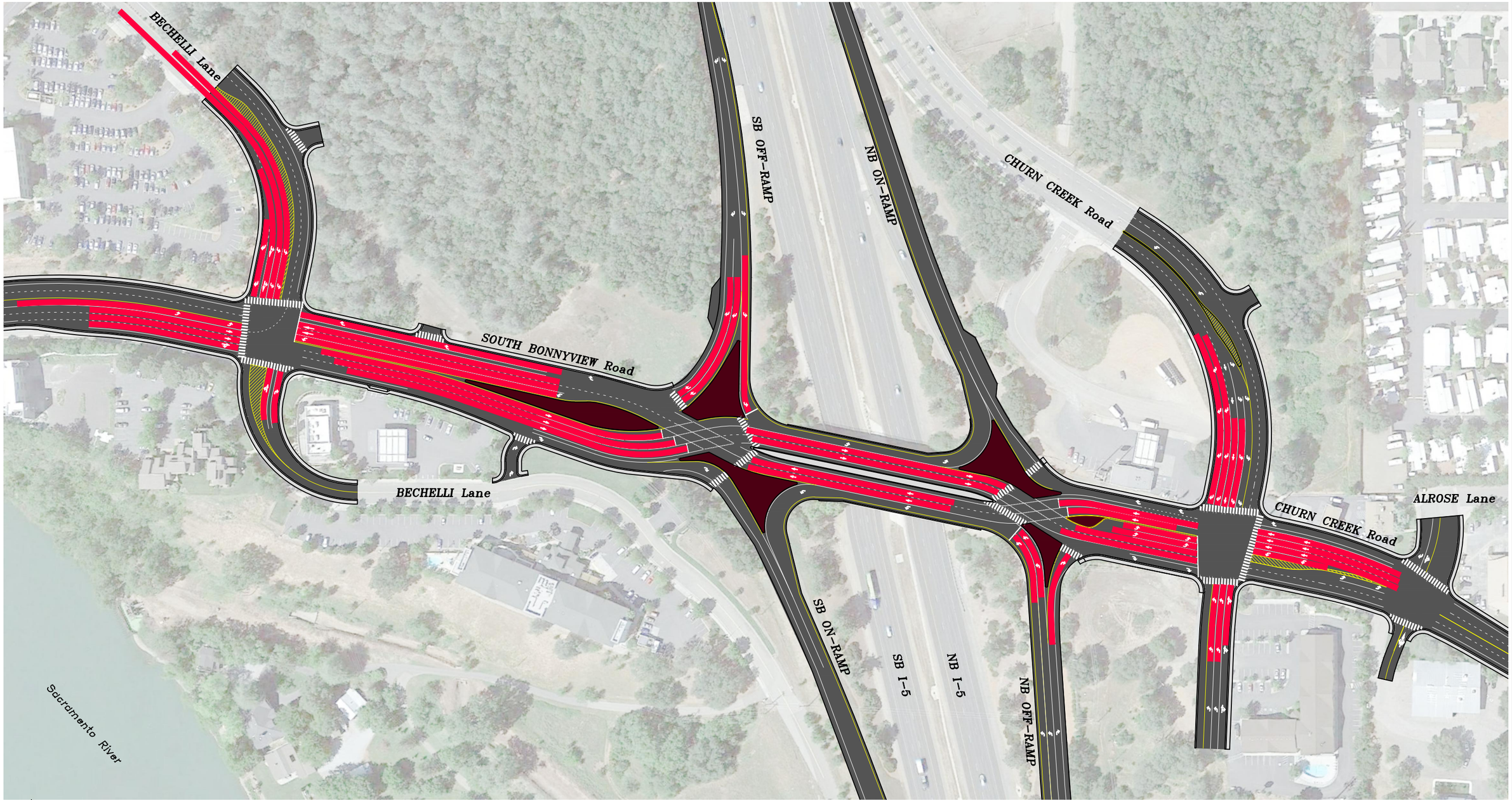

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE A).

PRELIMINARY, NOT FOR CONSTRUCTION

ATTACHMENT 4

REVISIONS			
NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

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ENGINEERS PLANNERS
REDDING
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VISALIA

JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 PM QUEUE LENGTHS
REVISED ALTERNATIVE 2 - DDI & SIGNALS CONCEPT
REDDING, CALIFORNIA

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1 OF 1

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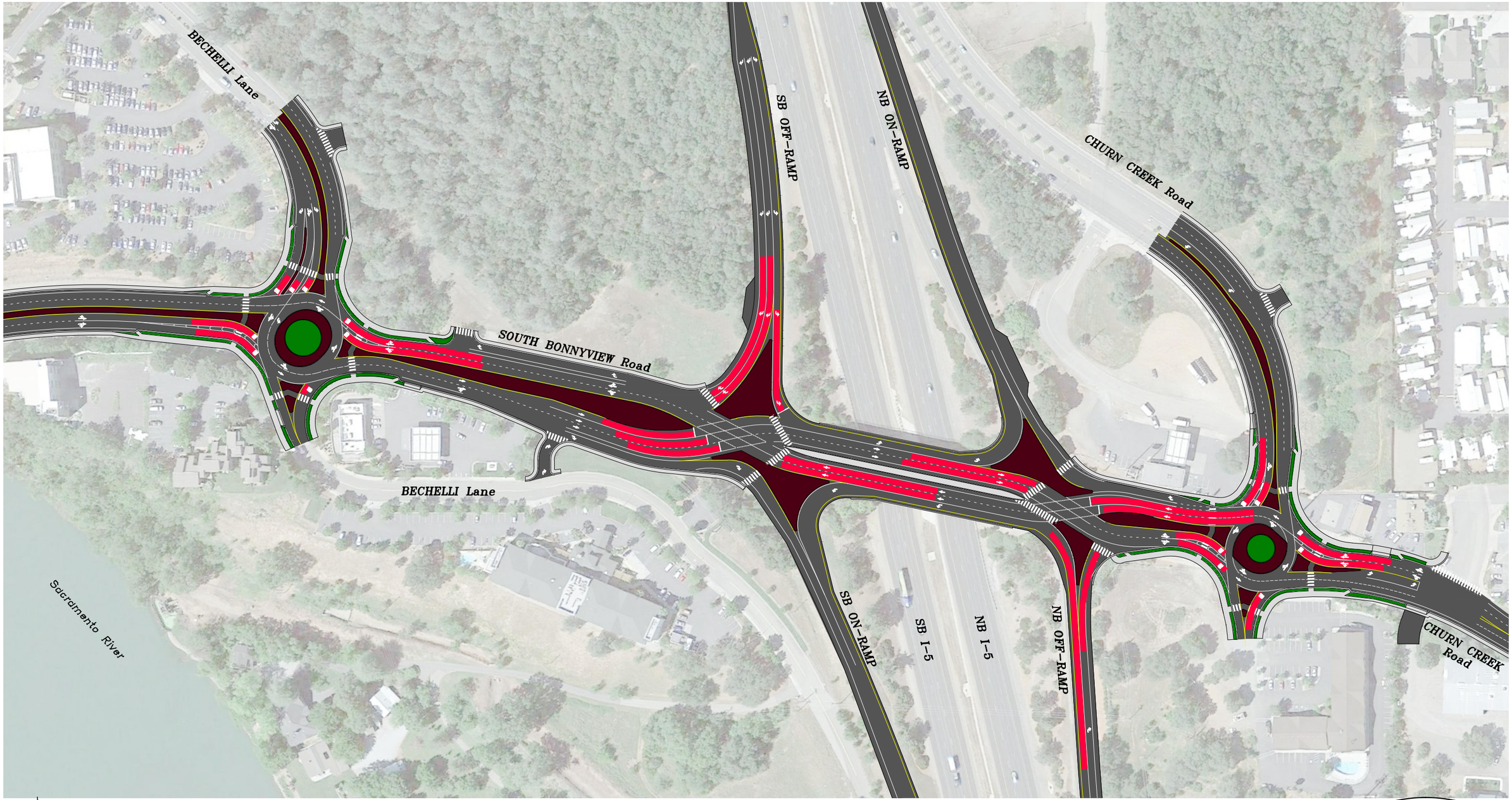

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE A).

PRELIMINARY, NOT FOR CONSTRUCTION

ATTACHMENT 5

REVISIONS			
NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

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ENGINEERS PLANNERS
REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA
JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 AM QUEUE LENGTHS
REVISED ALTERNATIVE 4 - DDI & ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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CHECKED	RAW
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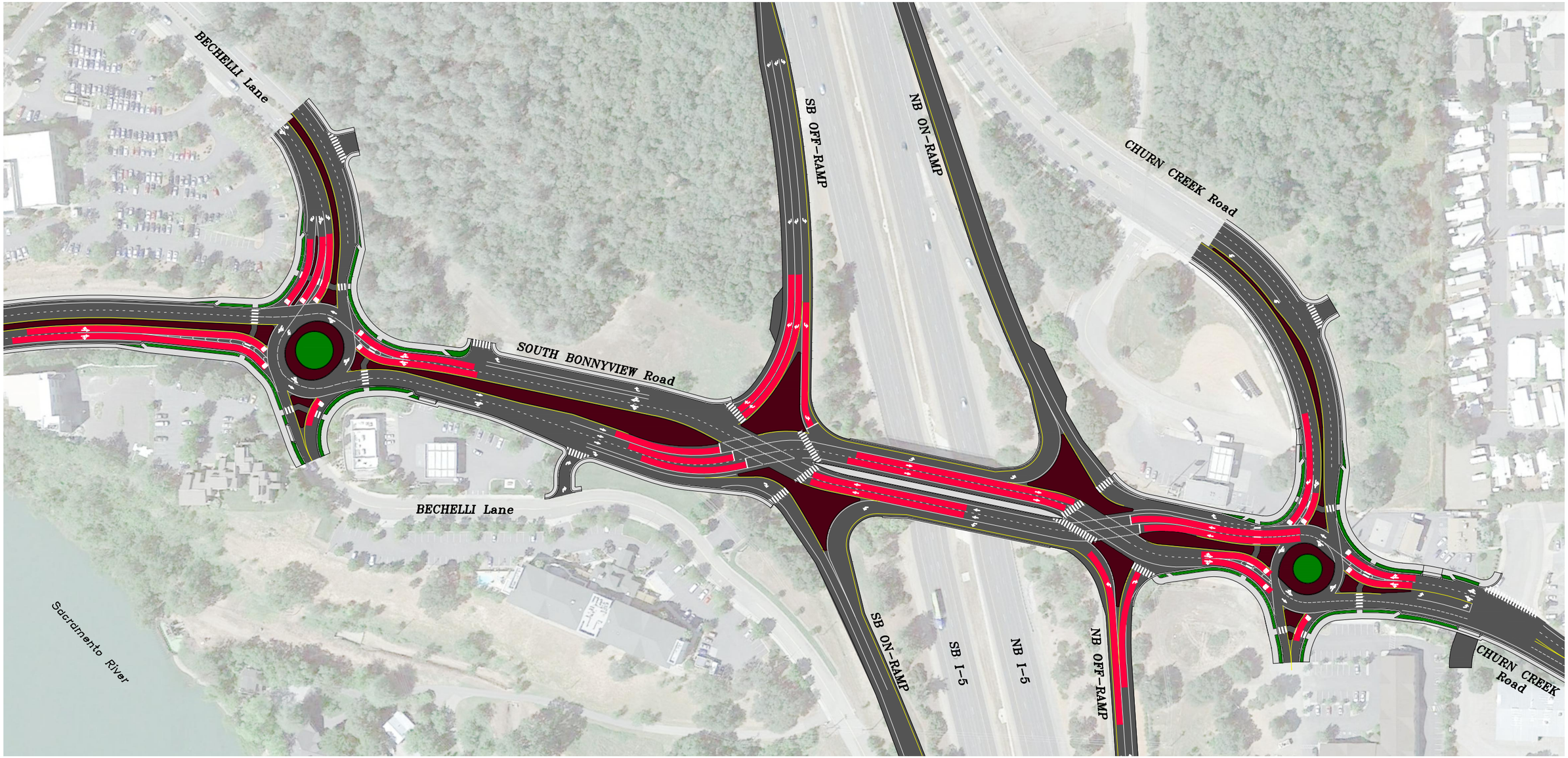

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE A).

PRELIMINARY, NOT FOR CONSTRUCTION

ATTACHMENT 6

REVISIONS			
NO.	DESCRIPTION	DATE	BY

80 0 80
1 inch = 80 ft.

omni • means
ENGINEERS PLANNERS
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Redding, CA 96002
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ROSEVILLE
WALNUT CREEK
VISALIA

JOB NO. 45-5721-27

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 PM QUEUE LENGTHS
REVISED ALTERNATIVE 4 - DDI & ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

SCALE	1"=80'
DESIGNED	MES
DRAWN	MES
CHECKED	RAW
FILE NAME	2174EX012
DATE	04/28/17

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1 OF 1

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Technical Memorandum No. 15

To:	City of Redding - Engineering	**Date:**	~~April 28, 2017~~ May 5, 2017
Attn:	Mr. Chuck Aukland, PE	**Project:**	I-5 / S. Bonnyview Interchange PSR
From:	Mr. Russ Wenham & Mr. Kamesh Vedula		
Re:	T. Operations for Alternative 1 (Tight Diamond), Alternative 2 (Diverging Diamond Interchange with Signals), and Alternative 4 (Diverging Diamond with Roundabouts) ***with Rancheria Development***	**Job No.:**	45-5721-27
		File No.:	C2174MEM015
CC:	Kent Manual, John Abshier, Brian Crane, Rob Stinger, John Wong, Derek Willis, Dale Widner		

The analysis for the I-5 / S. Bonnyview Interchange PSR commenced in May 2016.

On November 29, 2016, the Bureau of Indian Affairs (BIA) published a Notice of Intent to Prepare an Environmental Impact Statement (EIS) for the Proposed Redding Rancheria Fee-to-Trust and Casino Project, south-west of the I-5 / S. Bonnyview Interchange. Herein after the Redding Rancheria's project is referred to as "Rancheria Development".

The Rancheria Development application to BIA would place approximately 232 acres of fee land in trust by the United States and the Redding Rancheria would construct a casino resort. The resort would include an approximately 140,000 square foot casino, an approximately 250-room hotel, an event/convention center and an approximately 130,000 square foot outdoor sports retail center.

Kimley-Horn (K-H), subconsultant to EIS prime consultant Analytical Environmental Services (AES), prepared a *Trip Generation and Distribution Methodology* Memorandum on September 7, 2016. For weekday PM peak hour conditions, the trip generation and distribution contained in the September 7, 2016 K-H memorandum is sufficient for use in this I-5 / S. Bonnyview Interchange PSR study.

The K-H memorandum did not address weekday AM peak hour trip generation. The weekday AM peak hour trip generation for the Rancheria Development was derived by Omni-means and is presented in Table 1.

This memorandum analyzes the potential impact of the Rancheria Development on the results presented in previous Technical Memorandums. The corridor operations for Full Rancheria Development during the AM peak were found to be better than the Half Rancheria Development during the PM peak period. As such, it can be concluded that the Half Rancheria Development during the PM peak period will dictate the geometric requirements for the corridor. Therefore, detailed LOS and queue analysis was not performed for the Half Rancheria Development during the AM peak period. For geometric design purposes, the results of the weekday AM and PM peak hour analysis is presented below.

Traffic Forecasts

Refer to Technical Memorandum No. 6. for the without Rancheria Development base 2045 traffic volumes.

Table 1: AM Rancheria Trip Generation

Land Use	ITE Code	Quantity	Units	Weekday AM Peak Hour		
				In	Out	Total
Casino	N/A	140,000	SF	206	88	294
Conference Center	N/A	10,080	SF	178	45	223
Event Center	N/A	1,800	Seats	12	2	14
Hotel	310	250	Rooms	18	15	33
Sporting Goods Superstore	861	130,000	SF	111	83	194
Subtotal Vehicle Trips				525	233	758
Diverted Link Trips (10%) - Applied only to Casino and Sporting Goods Store				(32)	(17)	(49)
Net New Vehicle Trips				493	216	709

The potential traffic volumes from the Rancheria Development were obtained from the K-H *Trip Generation and Distribution Methodology* Memorandum on September 7, 2016.

In order to provide a *sensitivity analysis*, the analysis was performed with half Rancheria Development and full Rancheria Development. For *reality* check purposes the casino portion of the Rancheria Development will generate approximately 57% of the total weekday PM peak hour traffic.

Technical Parameters for Traffic Operations Analysis

No change. Refer to Technical Memorandum No. 7.

LOS and Delays

Alternative 1A - Traditional Tight Diamond - Half Rancheria Development

Year 2045 mitigated LOS and delays for Alternative 1A (Tight Diamond) is presented in Table 2.

Table 2: Year 2045 LOS and Delays for Alternative 1A

#	Intersection	Control Type[1,2]	Target LOS	PM Peak Hour	
				Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	37.6	D
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	18.4	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	29.0	C
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	30.7	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	23.3	C

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 1A (Tight Diamond) is presented in Table 3. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.

Table 3: 95th Percentile Queue for Alternative 1A

Int. #	Intersection/Approach	Control Type	95th Percentile Queue (ft)[1] PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**
	Eastbound Left	Signal	297	400
	Eastbound Thru		336	
	Eastbound Thru/Right		56	350
	Westbound Left		321	350
	Westbound Thru		425	
	Westbound Right		194	550
	Northbound Left/Thru		267	
	Northbound Right		194	150
	Southbound Left		214	300
	Southbound Left/Thru		298	
	Southbound Right		167	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**
	Eastbound Thru	Signal	188	300
	Eastbound Right		313	350
	Westbound Left		127	300
	Westbound Thru		67	
	Southbound Left/Thru		302	
	Southbound Right		336	300
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**
	Eastbound Left	Signal	338	
	Eastbound Thru		193	
	Westbound Thru		259	
	Westbound Right		171	
	Northbound Left		264	450
	Northbound Left/Thru		311	
	Northbound Right		160	400

Table 3: 95th Percentile Queue for Alternative 1A (Continued)

Int. #	Intersection/Approach	Control Type	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**
	Eastbound Left	Signal	227	175
	Eastbound Thru		184	
	Eastbound Right		46	145
	Westbound Left		61	
	Westbound Thru		204	
	Westbound Right		96	200
	Northbound Left		105	
	Northbound Thru/Right		63	
	Southbound Left		175	225
	Southbound Thru		28	
	Southbound Right		172	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**
	Eastbound Left	TWSC	74	110
	Westbound Left/Thru		38	
	Westbound Thru/Right		8	
	Northbound Left/Thru/Right		46	
	Southbound Left/Thru		40	
	Southbound Right		67	

1. Worst lane movement (of the approach) value stated.

Alternative 2A - Diverging Diamond Interchange with Signals - Half Rancheria Development

Year 2045 mitigated LOS and delays for Alternative 2A (Diverging Diamond Interchange with Signals) is presented in Table 4.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 4: Year 2045 LOS and Delays for Alternative 2A

#	Intersection	Control Type[1,2]	Target LOS	PM Peak Hour	
				Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.4	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.5	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	20.0	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 2A (Diverging Diamond Interchange with Signals) is presented in Table 5. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the VISSIM version 8 using microsimulation.



Table 5: 95th Percentile Queue for Alternative 2A

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	55.8	265.9	400
	Eastbound Thru/Right		60.4	289.1	
	Westbound Left/Thru/Right		164.3	416.8	550
	Northbound Left/Thru		19.8	142.9	100
	Northbound Right		8.9	214.5	100
	Southbound Left/Thru		75.0	379.4	300
	Southbound Right		27.8	286.6	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	76.8	447	630
	Westbound Left/Thru		49.2	321.2	500
	Southbound Left		5.0	204	450
	Southbound Right		57.3	303	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	37.3	411.1	480
	Westbound Thru/Right		48.5	292.4	450
	Northbound Left		9.8	127.4	450
	Northbound Right		19.3	223.8	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	35.6	237.2	150
	Eastbound Thru		18.8	231.9	210
	Westbound Left		9.1	102.9	
	Westbound Thru		54.9	232.6	
	Northbound Left		30.0	126.1	
	Northbound Thru/Right		6.3	62.7	
	Southbound Left/Thru		23.4	168.4	225
	Southbound Right		26.2	286.2	350

1. Worst lane movement (of the approach) value stated.



Alternative 4A - Diverging Diamond Interchange with Roundabouts - Half Rancheria Development

Year 2045 mitigated LOS and delays for Alternative 4A (Diverging Diamond Interchange with Roundabouts) is presented in Table 6.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 6: Year 2045 LOS and Delays for Alternative 4A

#	Intersection	Control Type[1,2]	Target LOS	PM Peak Hour	
				Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	20.1	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	13.3	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	12.9	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	12.4	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 4A (Diverging Diamond Interchange with Roundabouts) is presented in Table 7. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from a combination of Sidra version 7 using Highway Capacity Manual Methodology and VISSIM version 8 using microsimulation.

Table 7: 95th Percentile Queue for Alternative 4A

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		144.3	
	Eastbound Thru			144.3	
	Eastbound Thru/Right			173.3	
	Westbound Left/Thru			320.5	
	Westbound Thru/Right			323.3	
	Northbound Left/Thru			33.4	
	Northbound Right			55.9	
	Southbound Left			149.6	
	Southbound Left/Thru			190.4	
	Southbound Right			195.7	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	33.2	206.6	630
	Westbound Left/Thru		57.9	240.7	500
	Southbound Left		6.0	164.0	450
	Southbound Right		88.5	270.0	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	84.4	368.9	480
	Westbound Thru/Right		32.3	295.9	215
	Northbound Left		59.5	510.7	450
	Northbound Right		9.3	218.4	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		120.8	250
	Eastbound Thru/Right			127	250
	Westbound Left/Thru			113.7	
	Westbound Thru/Right			121.7	
	Northbound Left/Thru/Right			45.4	150
	Southbound Left/Thru			53.6	
	Southbound Right			187	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Alternative 1B - Traditional Tight Diamond - Full Rancheria Development

Year 2045 mitigated LOS and delays for Alternative 1B (Tight Diamond) is presented in Table 8.

Table 8: Year 2045 LOS and Delays for Alternative 1B

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	25.4	C	33.7	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	19.8	B	24.0	C
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	49.5	D	52.7	D
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	27.7	C	26.5	C
5	Churn Creek Rd/Alrose Lane	TWSC	D	14.0	B	24.0	C

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 1B (Tight Diamond) is presented in Tables 9. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the Synchro/Simtraffic version 9.1 using Highway Capacity Manual methodology and micro simulation.

Table 9: 95th Percentile Queue for Alternative 1B

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	213	189	400
	Eastbound Thru		300	368	
	Eastbound Right		116	172	350
	Westbound Left		244	243	275
	Westbound Thru		355	337	
	Westbound Right		131	142	550
	Northbound Left		77	170	200
	Northbound Left/Thru		147	260	
	Northbound Right		113	320	300
	Southbound Left		73	308	400
	Southbound Left/Thru		107	665	
	Southbound Right		108	258	
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru	Signal	143	262	300
	Eastbound Right		51	94	300
	Westbound Left		144	131	300
	Westbound Thru		331	172	
	Southbound Left/Thru		242	295	
	Southbound Right		372	382	425
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left	Signal	282	403	
	Eastbound Thru		157	172	
	Westbound Thru		262	252	
	Westbound Right		263	246	
	Northbound Left		315	452	450
	Northbound Left/Thru		357	519	
	Northbound Right		160	330	400

Table 9: 95th Percentile Queue for Alternative 1B (Continued)

Int. #	Intersection/Approach	Control Type	Year 2045 - 95th Percentile Queue (ft)[1] AM Peak Hour	PM Peak Hour	Available Storage
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	221	211	175
	Eastbound Thru		128	187	
	Eastbound Right		82	39	145
	Westbound Left		104	55	
	Westbound Thru		285	257	
	Westbound Right		221	103	200
	Northbound Left		165	217	
	Northbound Thru/Right		105	65	
	Southbound Left		141	171	230
	Southbound Thru		58	40	
	Southbound Right		144	274	300
5	***Churn Creek Rd/Alrose Lane***		**--**	**--**	**--**
	Eastbound Left	TWSC	51	80	110
	Westbound Left/Thru		24	66	
	Westbound Thru/Right		96	18	
	Northbound Left/Thru/Right		-	58	
	Southbound Left/Thru		27	42	
	Southbound Right		88	69	

1. Worst lane movement (of the approach) value stated.

Alternative 2B - Diverging Diamond Interchange with Signals - Full Rancheria Development

Year 2045 mitigated LOS and delays for Alternative 2B (Diverging Diamond Interchange with Signals) is presented in Table 10.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 10: Year 2045 LOS and Delays for Alternative 2B

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	Signal	D	20.5	C	27.5	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	16.3	B	14.8	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	11.2	B	10.7	B
4	S. Bonnyview Rd/Churn Creek Rd	Signal	D	23.0	C	20.3	C

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 2B (Diverging Diamond Interchange with Signals) are presented in Tables 11 and 12. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from the VISSIM version 8 using micro-simulation.



Table 11: 95th Percentile AM Queue for Alternative 2B

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1] Average	Year 2045 Queue (ft) AM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	50.3	268.4	400
	Eastbound Thru/Right		57.5	347.5	
	Westbound Left		36.8	211.0	550
	Westbound Thru		51.9	370.9	550
	Westbound Right		5.8	206.5	550
	Northbound Left/Thru		26.3	150.4	100
	Northbound Right		23.5	205.8	100
	Southbound Left/Thru/Right		26.7	118.9	300
	Southbound Right		17.8	214.7	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	43.6	307.7	630
	Westbound Left/Thru		161.3	620.7	500
	Southbound Left		5.4	174	450
	Southbound Right		41.2	360.7	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	25.1	317.2	480
	Westbound Thru/Right		68.9	301.6	450
	Northbound Left		23	187.9	450
	Northbound Right		24.2	224.1	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	34.5	225.5	150
	Eastbound Thru		10.4	127.4	210
	Westbound Left		41.1	132.6	
	Westbound Thru		15.7	124.8	
	Northbound Left		10.7	86.3	
	Northbound Thru/Right		61.5	303.0	
	Southbound Left/Thru		22.6	106.6	225
	Southbound Right		22.5	204.0	350

1. Worst lane movement (of the approach) value stated.



Table 12: 95th Percentile PM Queue for Alternative 2B

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1] Average	Year 2045 Queue (ft) PM Peak Hour[1] Max	Available Storage
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left	Signal	57.9	287.8	400
	Eastbound Thru/Right		99.8	426.1	
	Westbound Left		52.9	296.2	550
	Westbound Thru		68.2	361.1	550
	Westbound Right		9.4	276.9	550
	Northbound Left/Thru		60.2	294.7	100
	Northbound Right		50.1	363.7	100
	Southbound Left/Thru/Right		82.9	461.9	300
	Southbound Right		31.7	361.4	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	108.5	562.1	630
	Westbound Left/Thru		82.0	533.0	500
	Southbound Left		8.1	240.0	450
	Southbound Right		29.7	296.4	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	47.8	539.1	480
	Westbound Thru/Right		55.6	331.1	450
	Northbound Left		13.3	147.9	450
	Northbound Right		19.7	223.9	400
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left	Signal	37.5	263.4	150
	Eastbound Thru		15.4	228.0	210
	Westbound Left		9.8	102.5	
	Westbound Thru		56.7	220.3	
	Northbound Left		28.4	108.1	
	Northbound Thru/Right		6.3	62.7	
	Southbound Left/Thru		23.5	168.1	225
	Southbound Right		28.0	287.5	350

1. Worst lane movement (of the approach) value stated.

Alternative 4B - Diverging Diamond Interchange with Roundabouts - Full Rancheria Development

Year 2045 mitigated LOS and delays for Alternative 4B (Diverging Diamond Interchange with Roundabouts) is presented in Table 13.

Note:

1. Churn Creek Rd/ Alrose Ln was analyzed for worst case scenario only (Alternative 1).

Table 13: Year 2045 LOS and Delays for Alternative 4B

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	S. Bonnyview Rd/Bechelli Lane	RNDBT	D	11.2	B	26.5	C
2	S. Bonnyview Rd/I-5 SB Ramps	Signal	D	12.3	B	14.8	B
3	S. Bonnyview Rd/I-5 NB Ramps	Signal	D	10.7	B	10.7	B
4	S. Bonnyview Rd/Churn Creek Rd	RNDBT	D	11.6	B	12.6	B

Notes:

1 LOS = Delay based on average of all approaches for Roundabout

3. Warrant = Based on California MUTCD Warrant 3

4. Bold font denotes unacceptable LOS

Year 2045 mitigated 95th percentile queues for Alternative 4B (Diverging Diamond Interchange with Roundabouts) are presented in Tables 13 and 14. In instances where there are more than two lanes for a particular movement/approach, queuing reported is for the worse lane movement/approach. The queues are developed from a combination of Sidra version 7 using Highway Capacity Manual Methodology and VISSIM version 8 using microsimulation.



Table 14: 95th Percentile AM Queue for Alternative 4B

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) AM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		81.9	
	Eastbound Thru			81.9	
	Eastbound Thru/Right			87.8	
	Westbound Left/Thru			237.1	
	Westbound Thru/Right			247	
	Westbound Right			78.4	
	Northbound Left/Thru			21.8	
	Northbound Right			32.3	
	Southbound Left			31.3	
	Southbound Left/Thru			31.3	
	Southbound Right			46.6	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	21.0	151.5	630
	Westbound Left/Thru		70.0	332.7	500
	Southbound Left		11.5	153.0	450
	Southbound Right		56.7	533.9	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	56.6	270.5	480
	Westbound Thru/Right		31.6	281.4	215
	Northbound Left		20.7	167.4	450
	Northbound Right		9.8	235.2	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		90.4	250
	Eastbound Thru/Right			94.4	250
	Westbound Left/Thru			154.1	
	Westbound Thru/Right			170.4	
	Northbound Left/Thru/Right			66.3	150
	Southbound Left/Thru			41.3	
	Southbound Right			120.8	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts



Table 15: 95th Percentile PM Queue for Alternative 4B

Int. #	Intersection/Approach	Control Type	Year 2045 Queue (ft) PM Peak Hour[1]		Available Storage
			Average	Max[2]	
1	***S. Bonnyview Rd/Bechelli Lane***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		264.5	
	Eastbound Thru			264.5	
	Eastbound Thru/Right			353	
	Westbound Left/Thru			234.5	
	Westbound Thru/Right			241.1	
	Westbound Right			101.1	
	Northbound Left/Thru			58.6	
	Northbound Right			150	
	Southbound Left			161	
	Southbound Left/Thru			216.3	
	Southbound Right			221.9	300
2	***S. Bonnyview Rd/I-5 SB Ramps***		**--**	**--**	**--**
	Eastbound Thru/Right	Signal	38.5	272.9	630
	Westbound Left/Thru		68.8	334.4	500
	Southbound Left		18.9	218.8	450
	Southbound Right		42.2	506.4	450
3	***S. Bonnyview Rd/I-5 NB Ramps***		**--**	**--**	**--**
	Eastbound Left/Thru	Signal	81.1	349.9	480
	Westbound Thru/Right		33.9	282.6	215
	Northbound Left		17.1	149.0	450
	Northbound Right		8.3	170.3	450
4	***S. Bonnyview Rd/Churn Creek Rd***		**--**	**--**	**--**
	Eastbound Left/Thru	Roundabout		122.1	250
	Eastbound Thru/Right			128.4	250
	Westbound Left/Thru			116.8	
	Westbound Thru/Right			125.3	
	Northbound Left/Thru/Right			45.8	150
	Southbound Left/Thru			54.3	
	Southbound Right			190.5	

1. Worst lane movement (of the approach) value stated.

2. 95th Percentile Queue for the Roundabouts

Network Sensitivity - Half Rancheria Development

Alternative 4A - Eastbound Bonnyview Road at Bechelli Lane

To avoid significant impacts associated with widening the roundabout at S. Bonnyview Road and Bechelli Lane to three lanes eastbound a sensitivity analysis of the approach was done for the Rancheria Development was conducted. Using Sidra and the PM trip generation expected for the Rancheria Development from the K-H traffic study, it was found that only 12% of the expected PM trips can be accommodated by a two lane Eastbound approach. At 15% of the expected trip generation the two lane roundabout approach will reach LOS F and require a third lane.



Attachments:

Half Rancheria Development:

Attachment 1: Alternative 1A - Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 2: Alternative 2A - Diverging Diamond Interchange with Signals Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 3: Alternative 4A - Diverging Diamond Interchange with Roundabouts Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Full Rancheria Development

Attachment 4: Alternative 1B - Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for AM Peak Hour

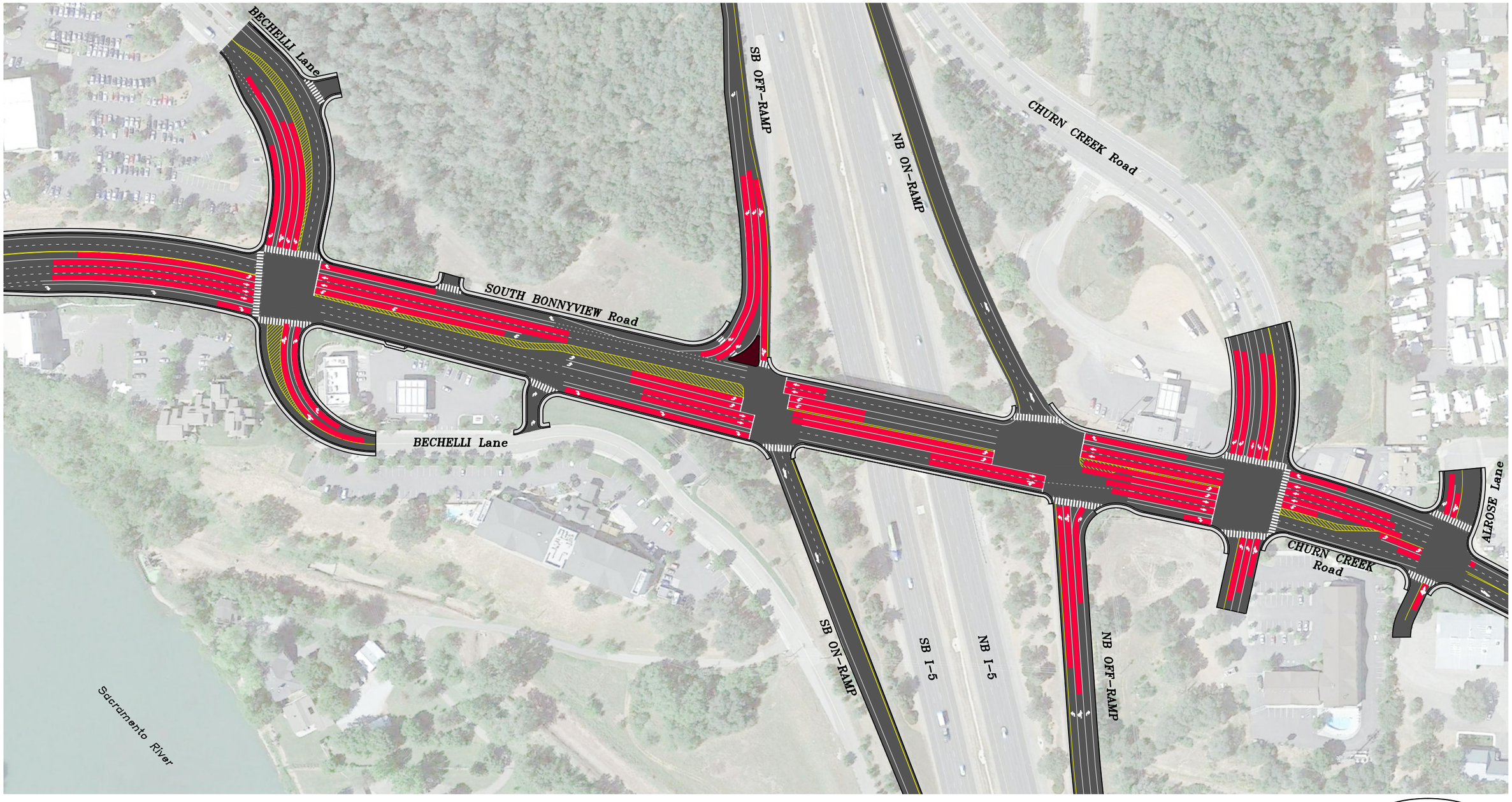
Attachment 5: Alternative 1B - Traditional Tight Diamond Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 6: Alternative 2B - Diverging Diamond Interchange with Signals Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 7: Alternative 2B - Diverging Diamond Interchange with Signals Lane Geometrics and 95th Percentile Queues for PM Peak Hour

Attachment 8: Alternative 4B - Diverging Diamond Interchange with Roundabouts Lane Geometrics and 95th Percentile Queues for AM Peak Hour

Attachment 9: Alternative 4B - Diverging Diamond Interchange with Roundabouts Lane Geometrics and 95th Percentile Queues for PM Peak Hour



PRELIMINARY, NOT FOR CONSTRUCTION

ATTACHMENT 1

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1 inch = 80 ft.

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ENGINEERS PLANNERS
REDDING
330 Hartnell Ave. Suite B
Redding, CA 96002
(530) 242-1700
Locations in
ROSEVILLE
WALNUT CREEK
VISALIA
JOB NO. JOB_NO.

I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 PM QUEUE LENGTHS (HALF RANCHERIA DEVELOPMENT)
ALTERNATIVE 1A - TIGHT DIAMOND
REDDING, CALIFORNIA

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CHECKED	RAW
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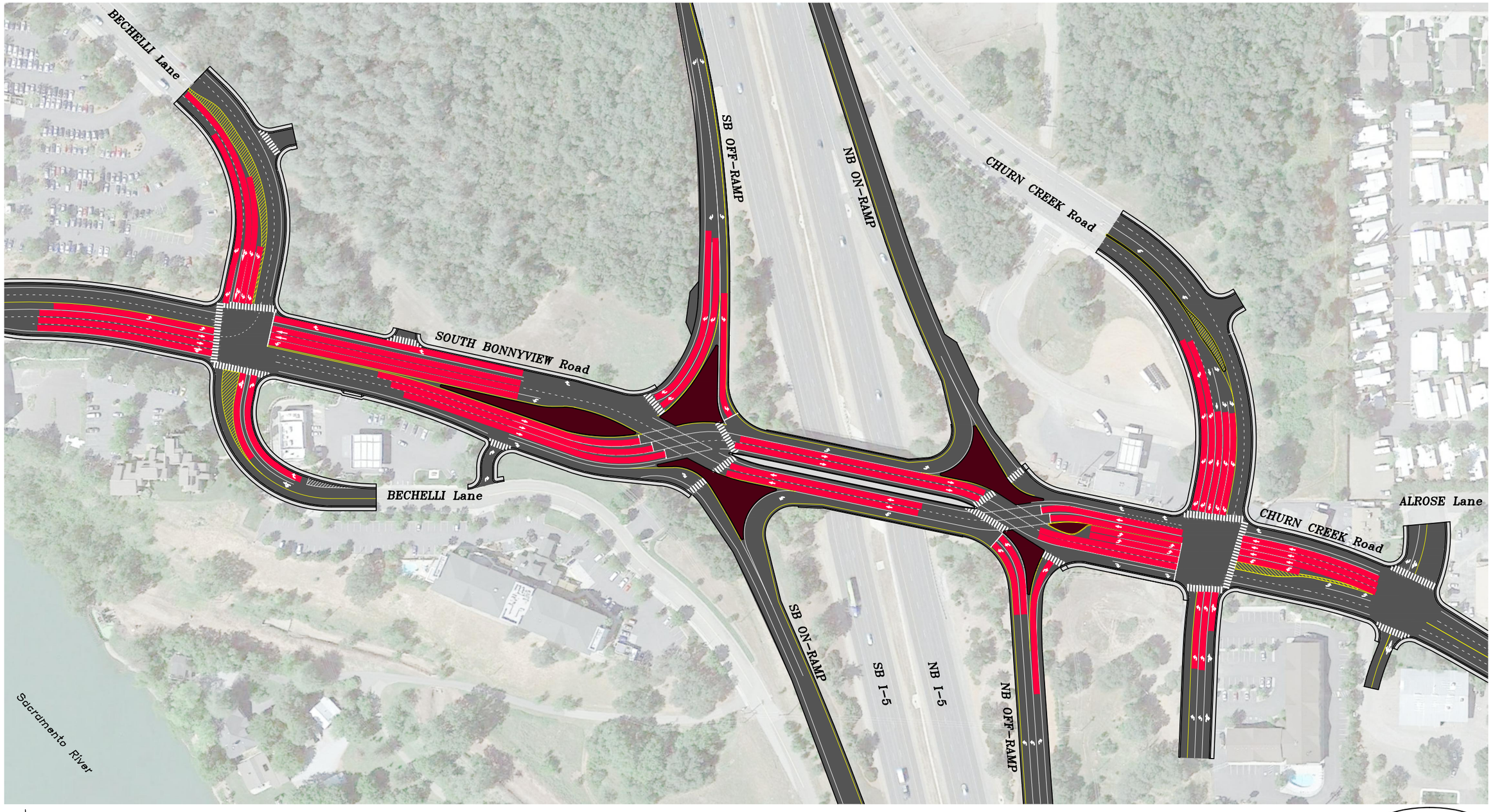

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 2

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I-5 / SOUTH BONNYVIEW INTERCHANGE PSR
YEAR 2045 PM QUEUE LENGTHS (HALF RANCHERIA DEVELOPMENT)
ALTERNATIVE 2A - DDI & SIGNALS CONCEPT
REDDING, CALIFORNIA

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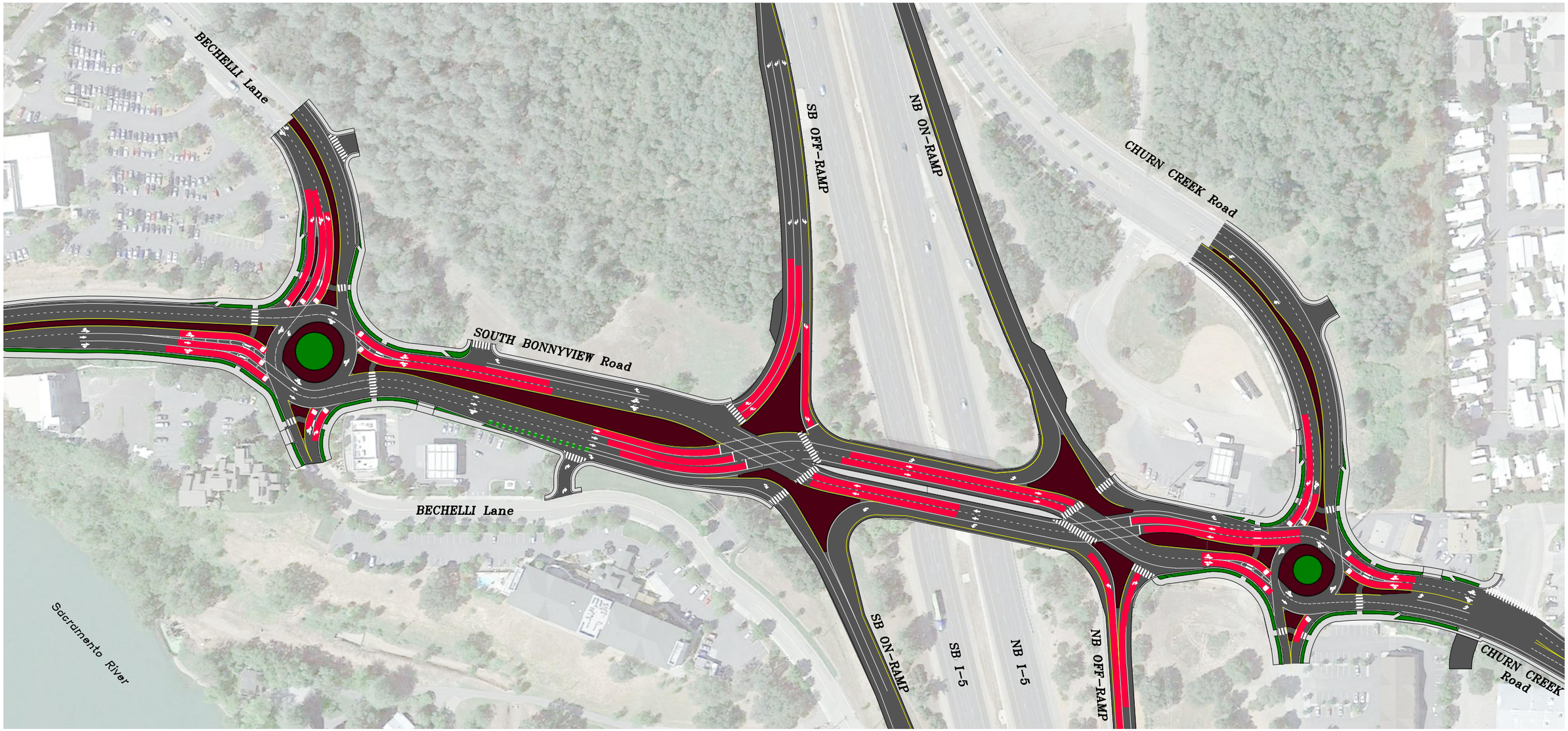

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 3

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YEAR 2045 PM QUEUE LENGTHS (HALF RANCHERIA DEVELOPMENT)
ALTERNATIVE 4A - DDI & ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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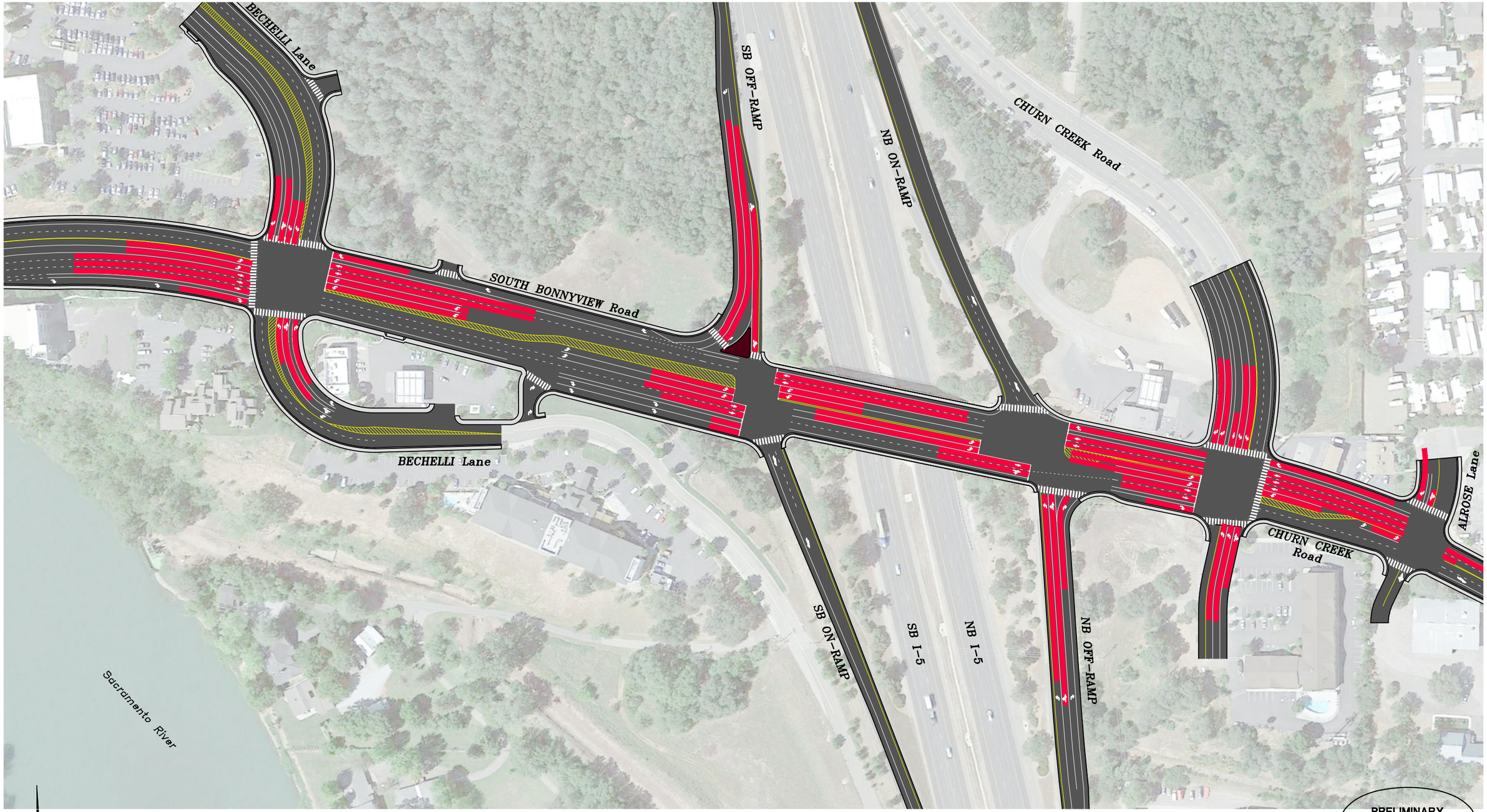

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1 inch = 80 ft.

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ENGINEERS PLANNERS
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YEAR 2045 AM QUEUE LENGTHS (FULL RANCHERIA DEVELOPMENT)
ALTERNATIVE 1B - TIGHT DIAMOND
REDDING, CALIFORNIA

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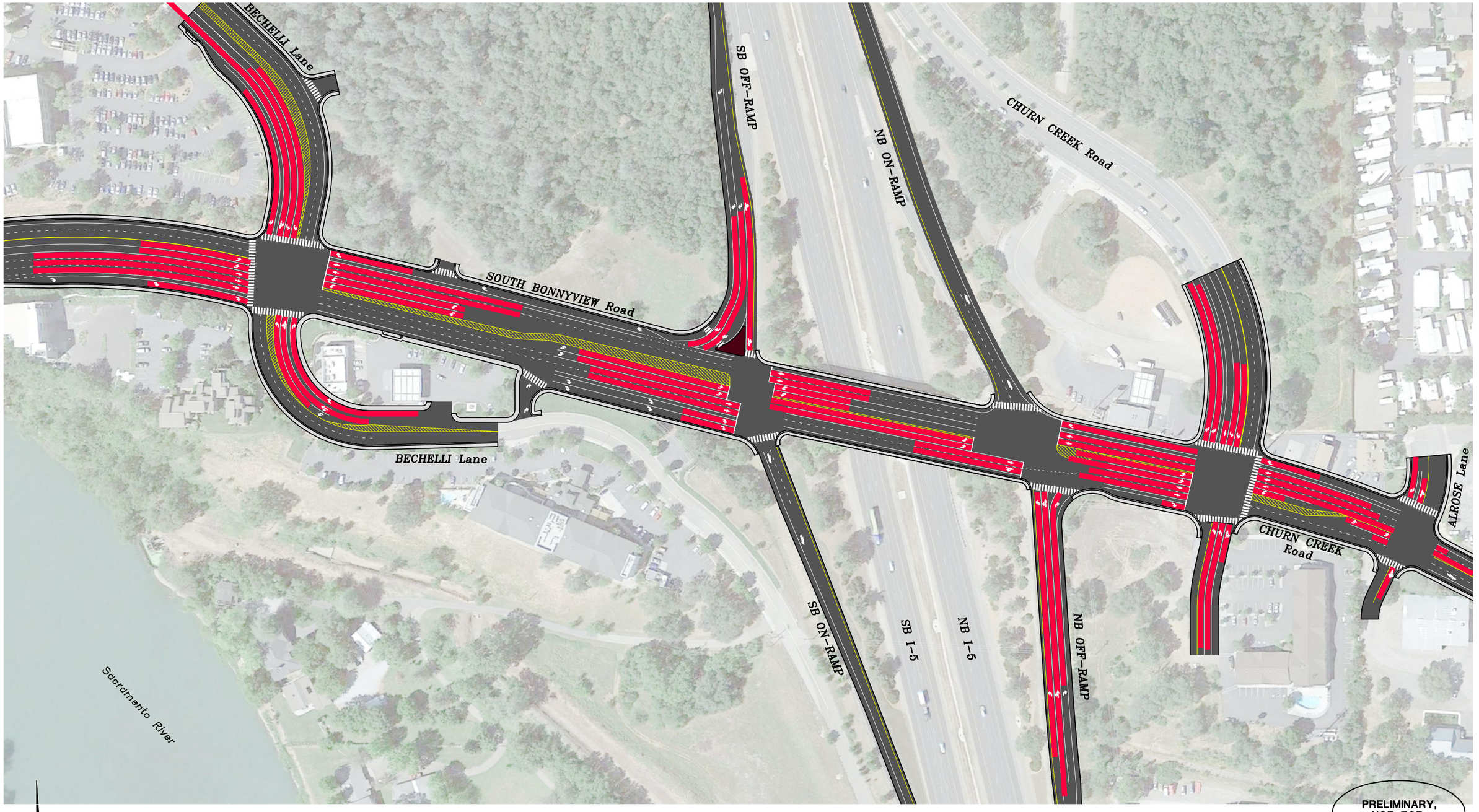

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ATTACHMENT 5

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1 inch = 80 ft.

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YEAR 2045 PM QUEUE LENGTHS (FULL RANCHERIA DEVELOPMENT)
ALTERNATIVE 1B - TIGHT DIAMOND
REDDING, CALIFORNIA

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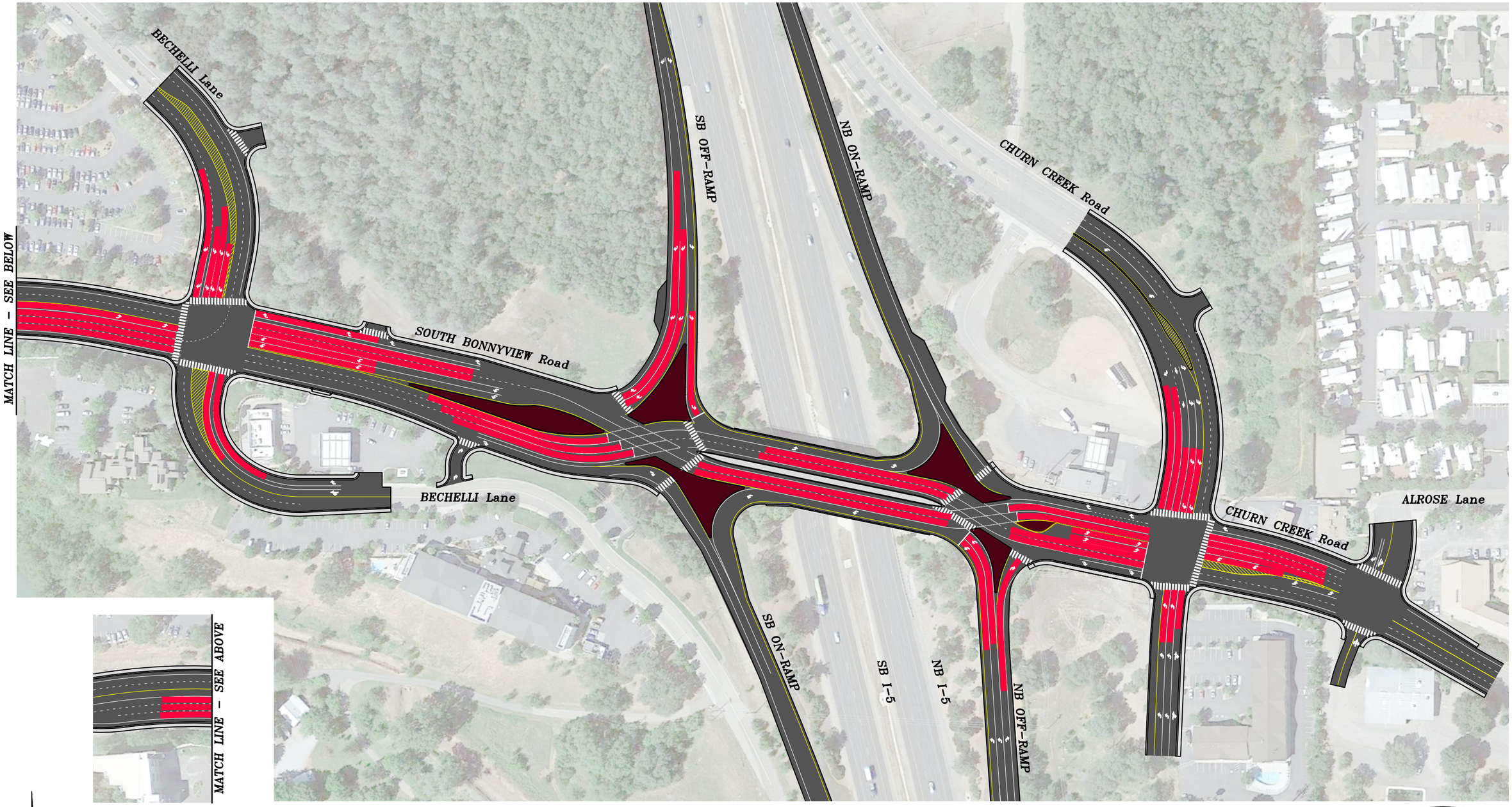

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 6

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1 inch = 80 ft.

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Locations in
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VISALIA

JOB NO. 45-5721-27

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YEAR 2045 AM QUEUE LENGTHS (FULL RANCHERIA DEVELOPMENT)
ALTERNATIVE 2B - DDI & SIGNALS CONCEPT
REDDING, CALIFORNIA

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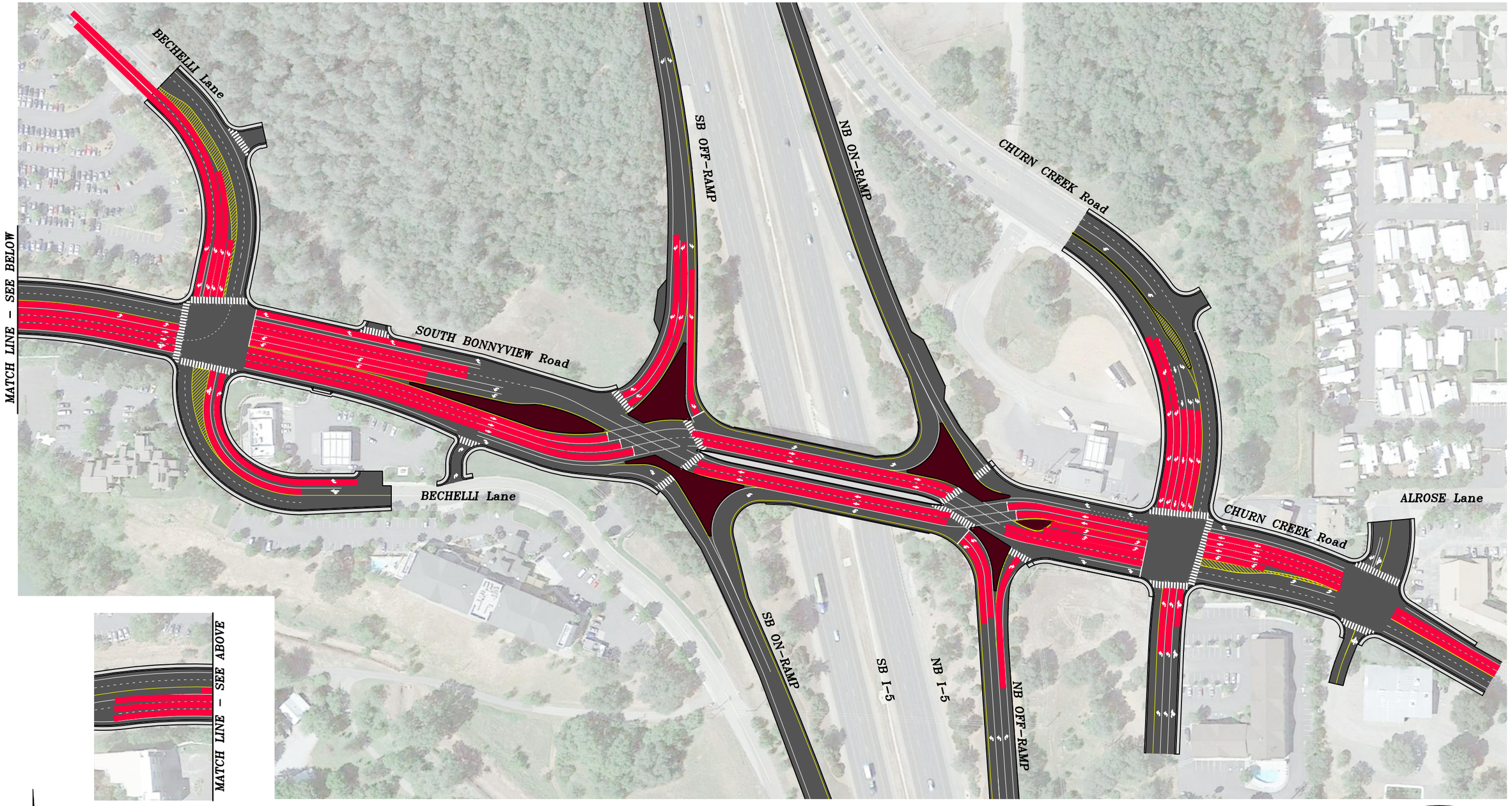

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 7

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1 inch = 80 ft.

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YEAR 2045 PM QUEUE LENGTHS (FULL RANCHERIA DEVELOPMENT)
ALTERNATIVE 2B - DDI & SIGNALS CONCEPT
REDDING, CALIFORNIA

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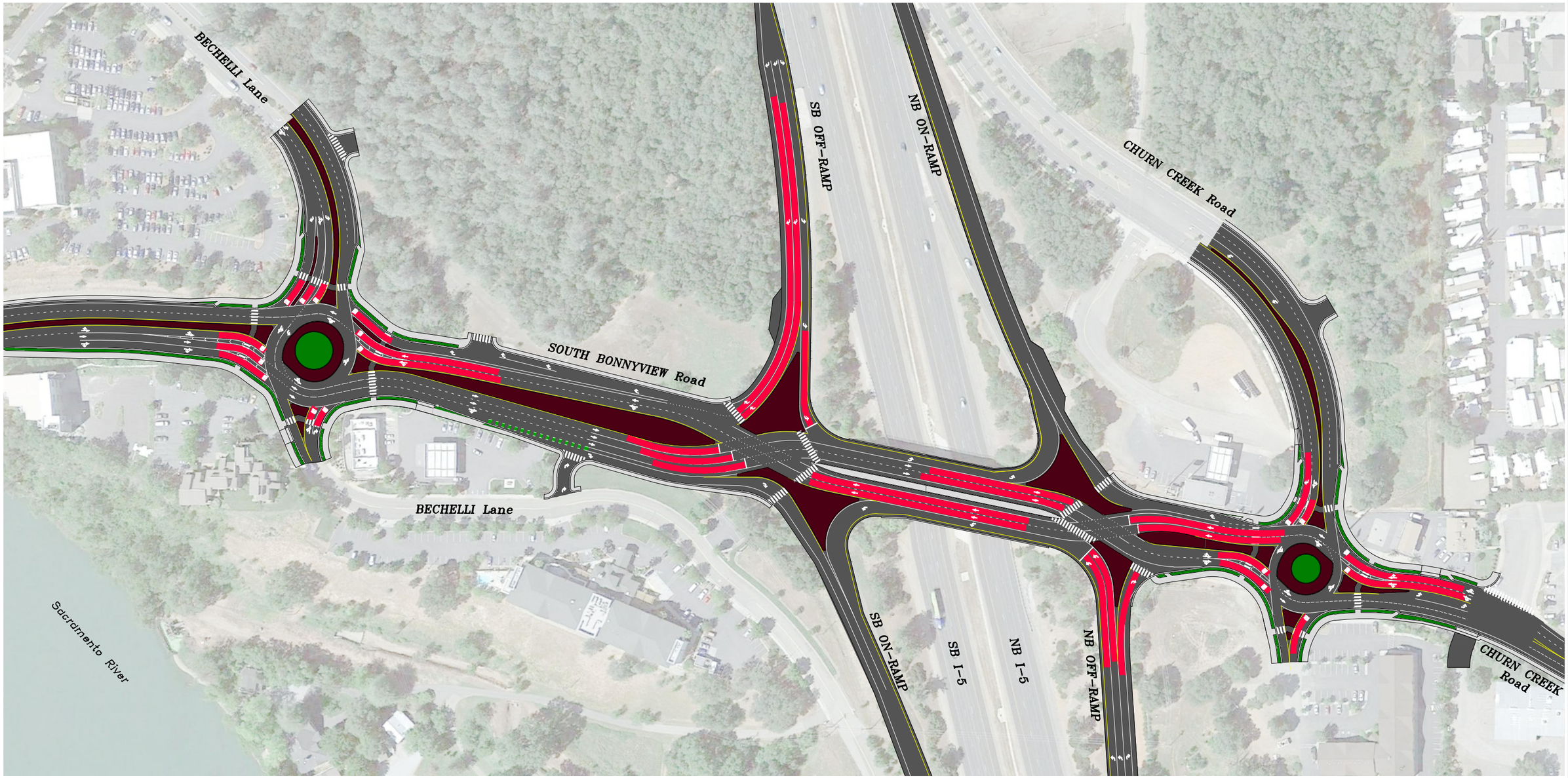

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 8

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1 inch = 80 ft.

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YEAR 2045 AM QUEUE LENGTHS (FULL RANCHERIA DEVELOPMENT)
ALTERNATIVE 4B - DDI & ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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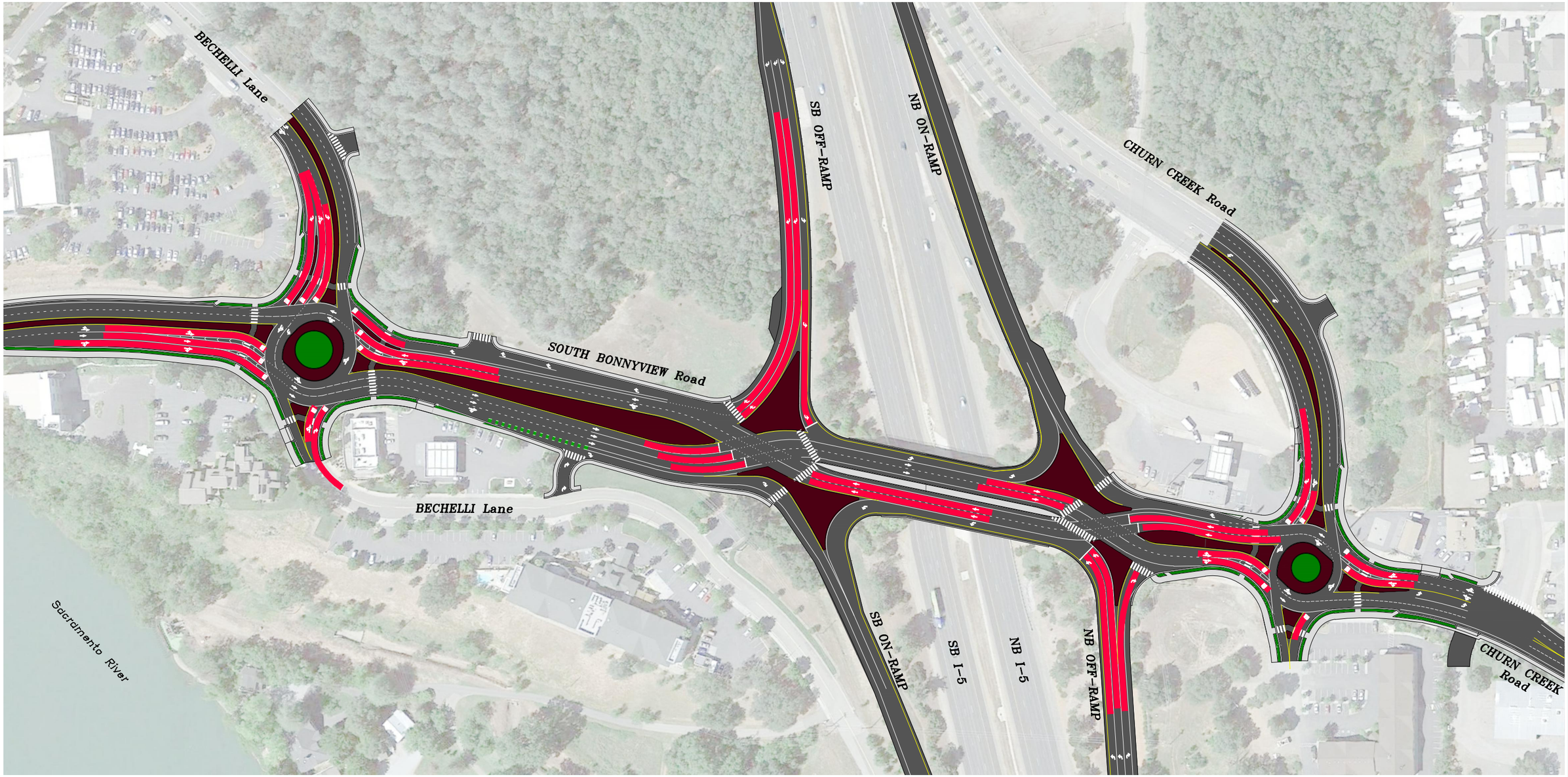

NOTE:
1. QUEUEING AT ALROSE LANE INTERSECTION IS ONLY PROVIDED FOR WORST CASE SCENARIO (ALTERNATIVE 1).

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ATTACHMENT 9

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NO.	DESCRIPTION	DATE	BY

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1 inch = 80 ft.

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YEAR 2045 PM QUEUE LENGTHS (FULL RANCHERIA DEVELOPMENT)
ALTERNATIVE 4B - DDI & ROUNDABOUT CONCEPT
REDDING, CALIFORNIA

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Appendix G: ~~Schematic Layout of Off Site Mitigations~~ Conceptual Designs of Proposed Improvements

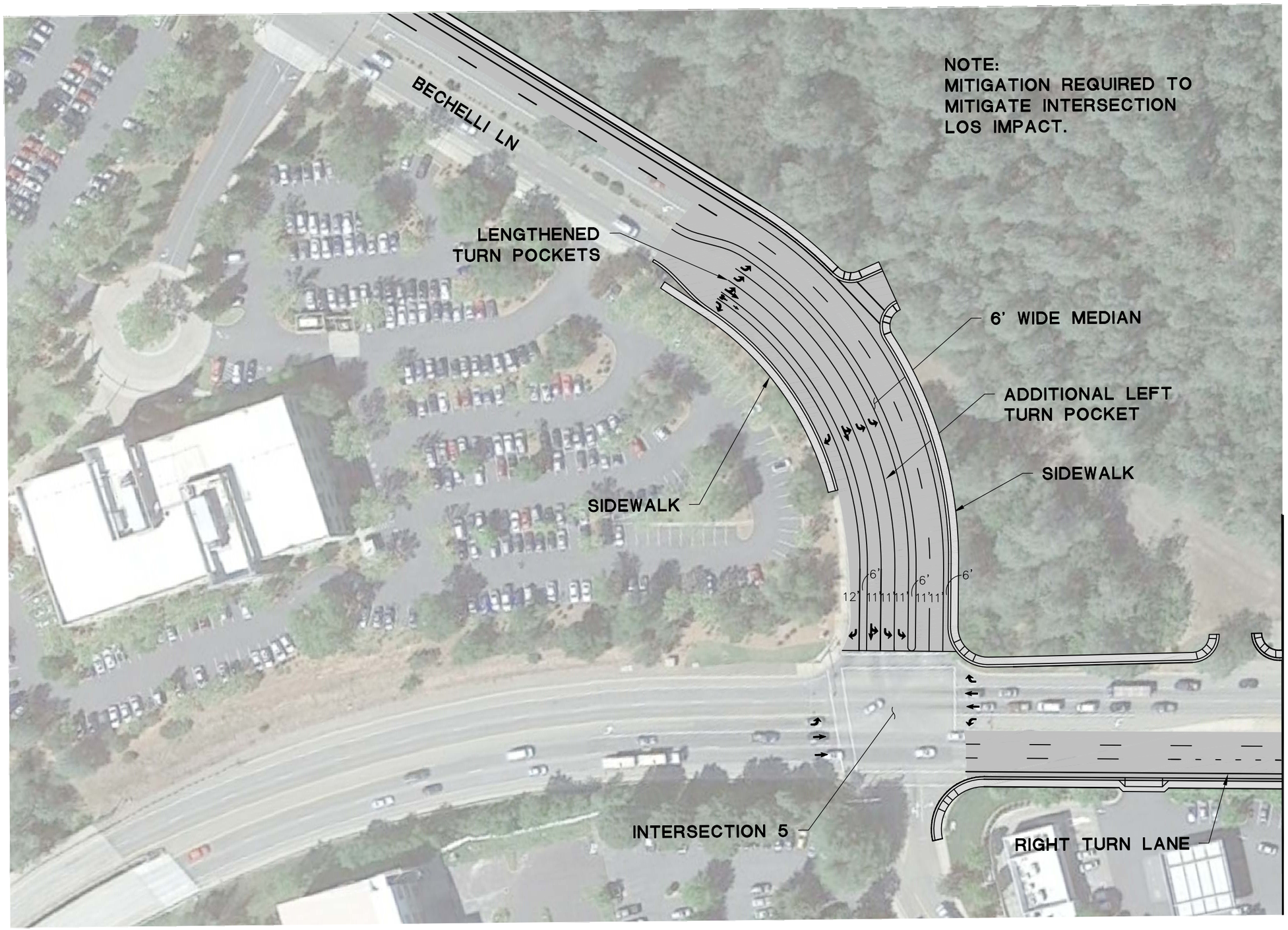

Figure 1
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Intersection 5 - Bechelli Ln & S. Bonnyview Rd ***2020 PLUS PROJECT***

River Crossing Marketplace Development

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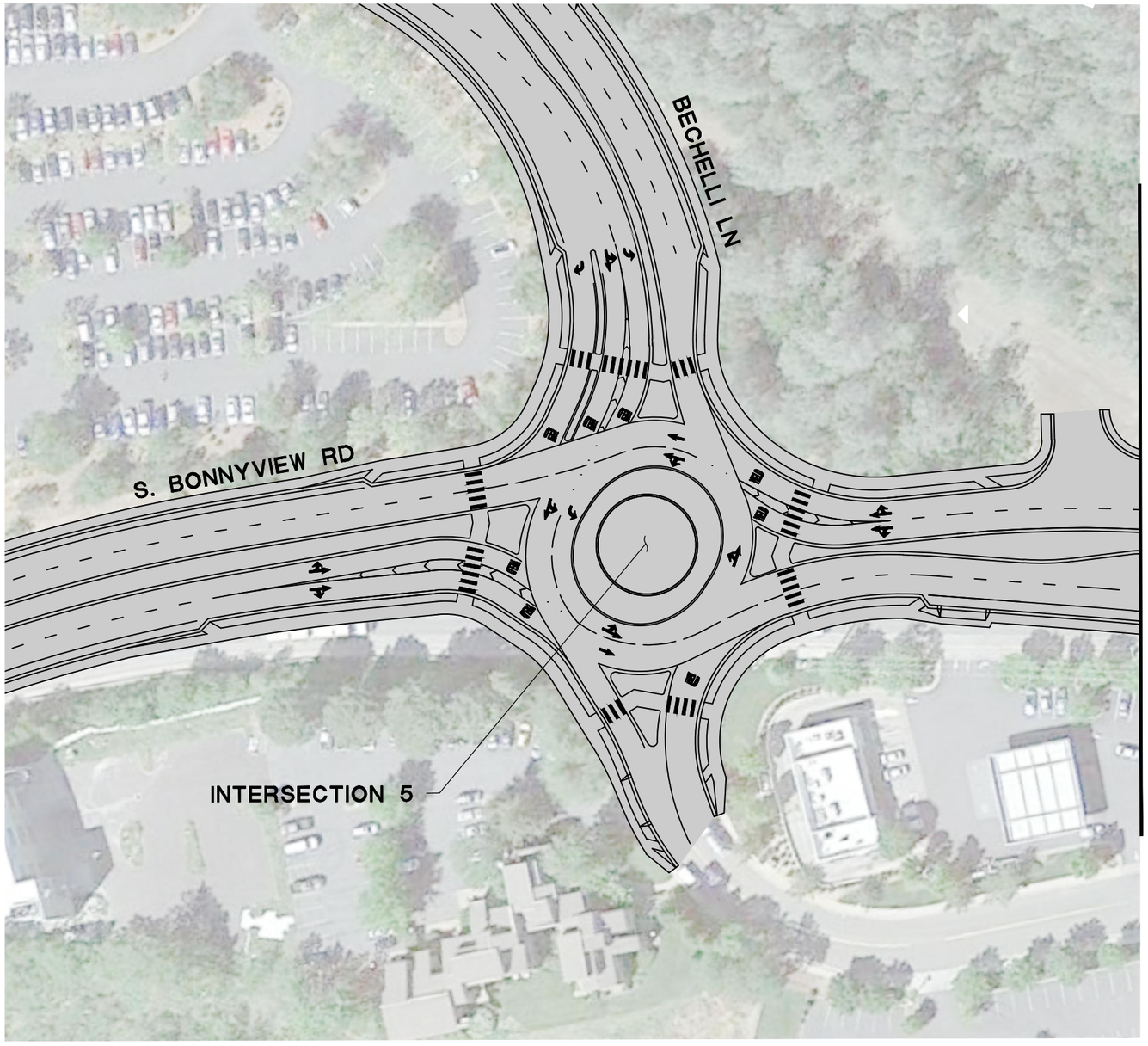
June 13, 2017
2226EX009.dwg



NORTH

Figure 1

SCALE: 1"=100'

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Intersection 5 - Bechelli Ln & S. Bonnyview Rd - Roundabout Alternative ***2020 PLUS & 2040 PLUS PROJECT***

River Crossing Marketplace Development

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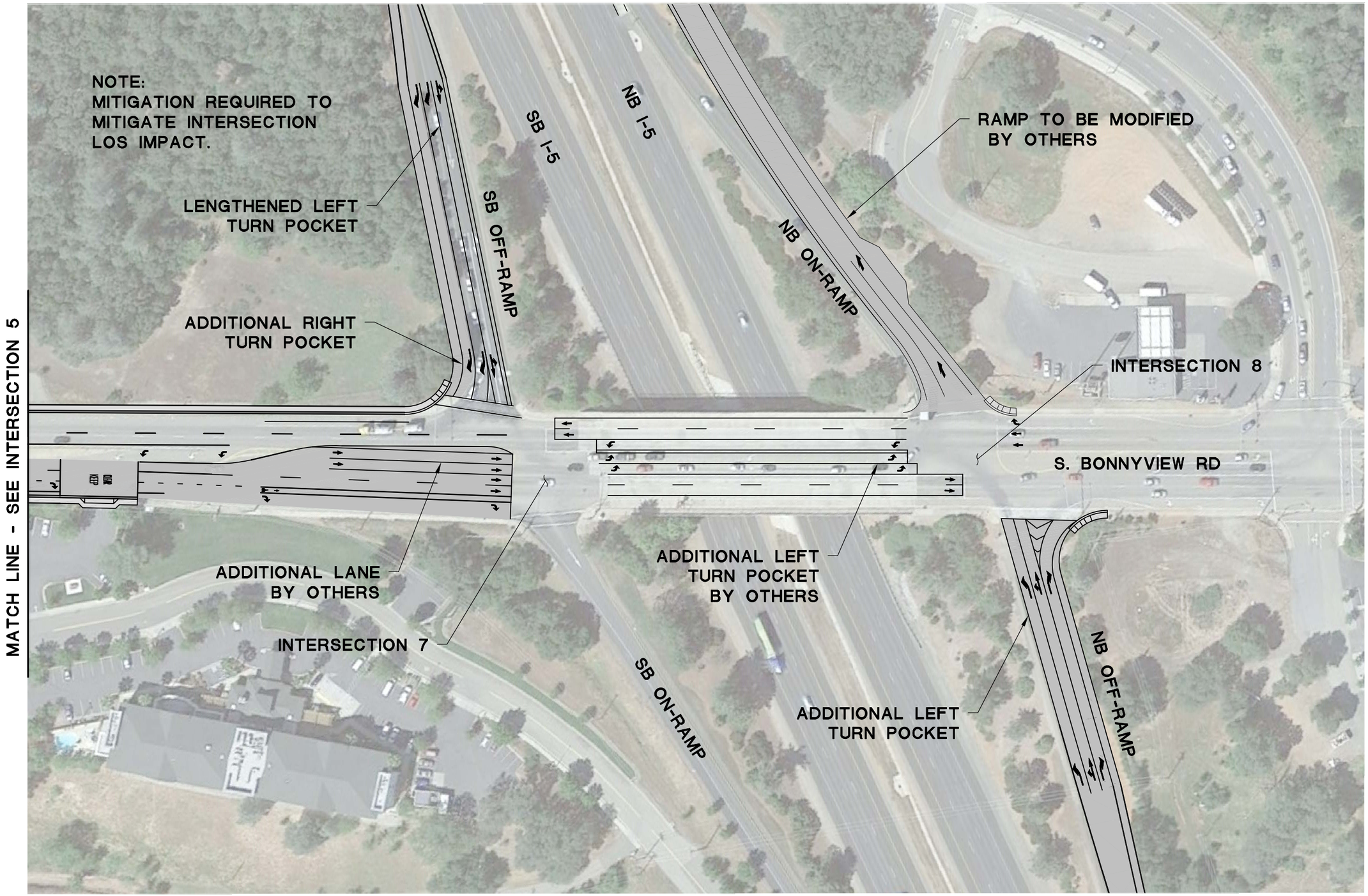
November 21, 2017
2226EX036.dwg



NORTH

Figure 1
SCALE: 1"=100'

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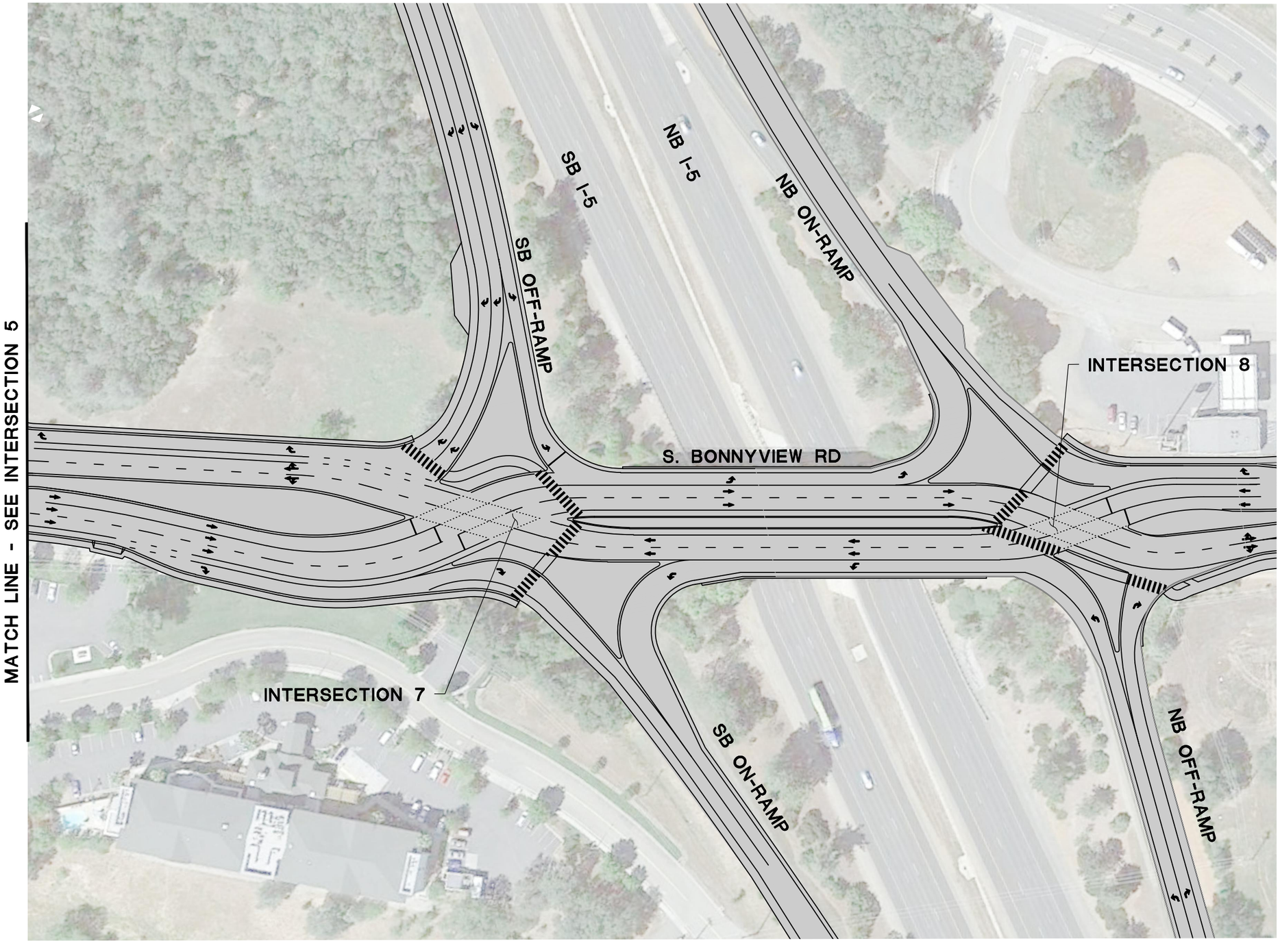
Intersection 7 & 8 - S. Bonnyview & NB/SB On & Off-Ramps ***2020 PLUS PROJECT***

River Crossing Marketplace Development

omni·means A GHD company

June 13, 2017
2226EX008.dwg



NORTH

Figure 1

SCALE: 1"=100'

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Intersection 7 & 8 - S. Bonnyview Rd & NB/SB On & Off Ramps - DDI Alternative ***2020 PLUS & 2040 PLUS PROJECT***

River Crossing Marketplace Development

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November 21, 2017
2226EX036.dwg

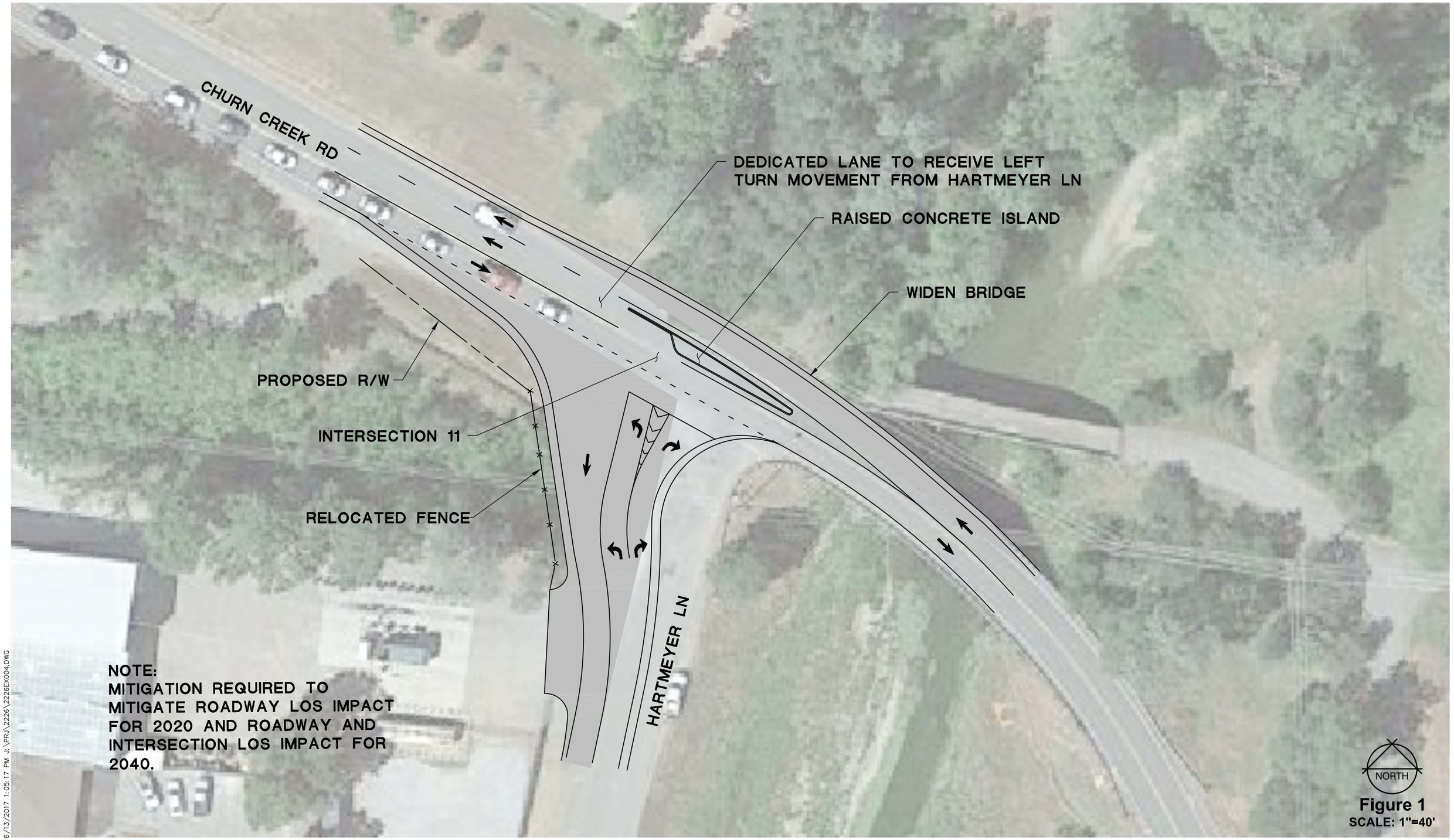

Figure 1
SCALE: 1"=40'

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Intersection 11 - Churn Creek Rd & Hartmeyer Ln — *2020 PLUS & 2040 PLUS PROJECT*

River Crossing Marketplace Development

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June 13, 2017
2226EX004.dwg

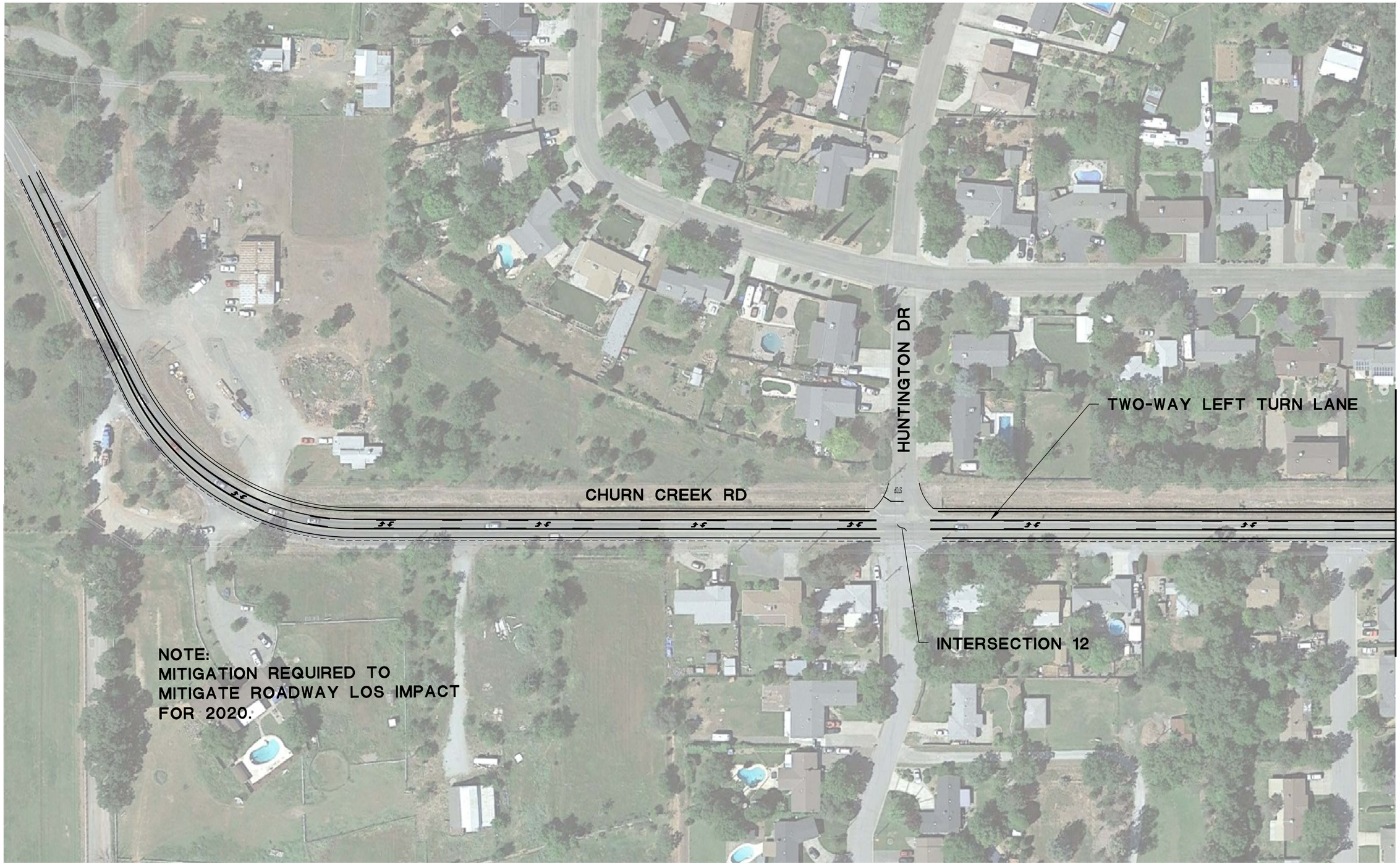

Figure 1
SCALE: 1"=120'

11/21/2017 4:30:24 PM J:\PRJ\2226\2226EX014.DWG

Intersection 12 - Churn Creek Rd & Huntington Dr ***2020 PLUS PROJECT***

River Crossing Marketplace Development

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October 25, 2017
2226EX014.dwg

VICTOR AVE

SINGLE LANE ROUNDABOUT

MATCH LINE
SEE INTERSECTION 12

CHURN CREEK RD

DEBBIE LN

INTERSECTION 13

INTERSECTION 14

CHURN CREEK RD

RANCHO RD

CONNECT TO
CHURN CREEK RD
(APPROX 860' FURTHER SOUTH)

NOTE:
MITIGATION REQUIRED TO MITIGATE ROADWAY LOS IMPACT FOR 2020 AND INTERSECTION AND ROADWAY LOS IMPACT FOR 2040.

NORTH

Figure 1

SCALE = 1"=100'

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Intersection 13 & 14 - Churn Creek Rd/ Victor Ave/ Rancho Rd ***2020 PLUS & 2040 PLUS PROJECT***

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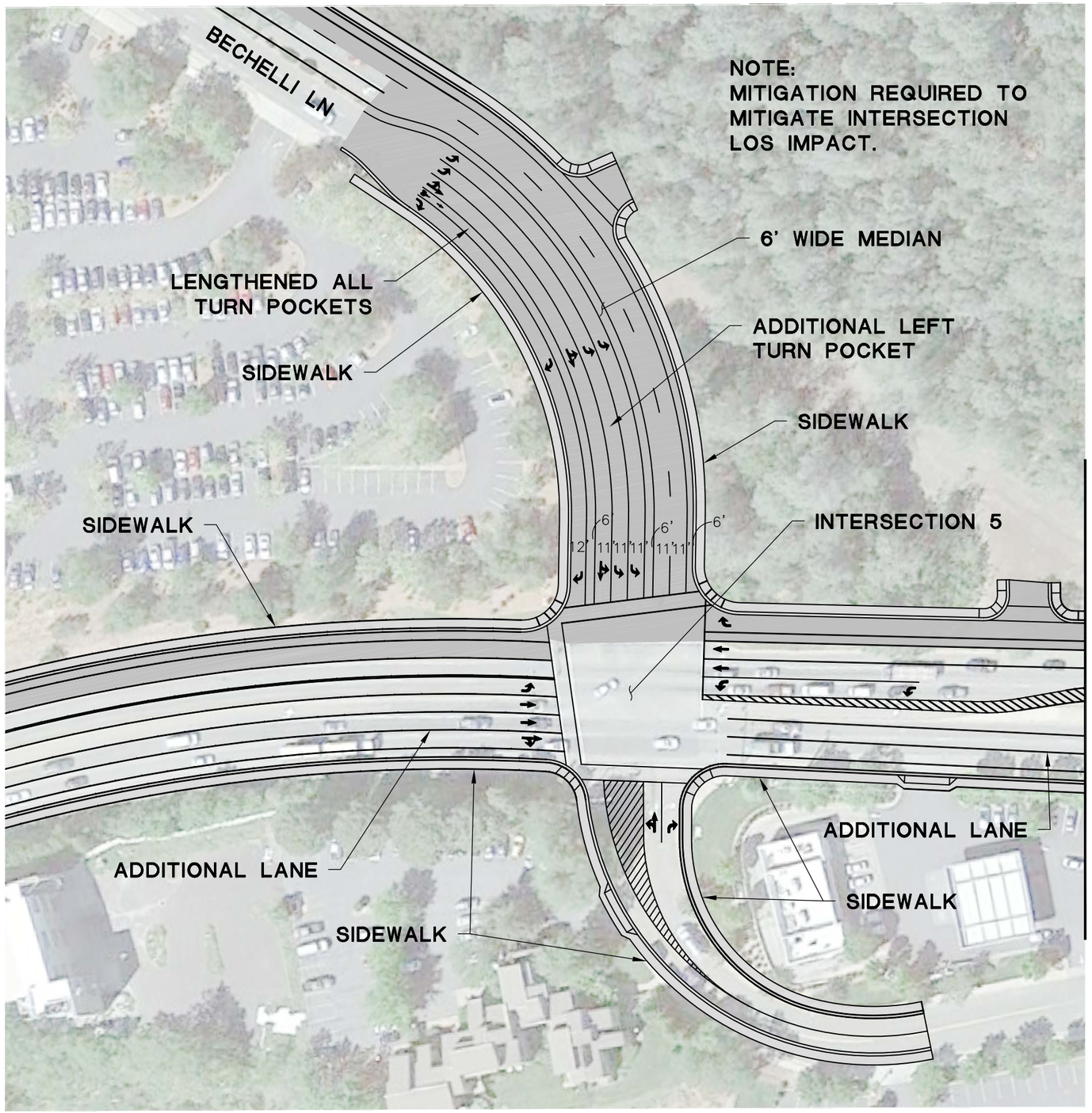

NORTH

Figure 1
SCALE: 1"=80'

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Intersection 5 - Bechelli Ln & S. Bonnyview Rd ***2040 PLUS PROJECT***

River Crossing Marketplace Development

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June 13, 2017
2226EX011.dwg

LENGTHENED LEFT TURN POCKET

ADDITIONAL RIGHT TURN POCKET

REMOVE LEFT TURN INTO GAS STATION

SIDEWALK

SB OFF-RAMP

SB I-5

NB I-5

NB ON-RAMP

RAMP TO BE MODIFIED BY OTHERS

ADDITIONAL LEFT TURN POCKET

INTERSECTION 8

S. BONNYVIEW RD

MATCH LINE - SEE INTERSECTION 5

ADDITIONAL LANE

INTERSECTION 7

ADDITIONAL LANE

ONE WAY NB RIGHT TURN ONLY CONNECTION TO S. BONNYVEW RD

WIDEN OVERCROSSING

ADDITIONAL LEFT TURN POCKET

SB ON-RAMP

ADDITIONAL LEFT TURN POCKET

NB OFF-RAMP

NOTE:
MITIGATION REQUIRED TO MITIGATE INTERSECTION LOS IMPACT.

NORTH

Figure 1
SCALE: 1"=100'

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Intersection 7 & 8 - S. Bonnyview & NB/SB On & Off-Ramps ***2040 PLUS PROJECT***

River Crossing Marketplace Development

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June 13, 2017
2226EX010.dwg

NOTES:

1. INTERSECTION IS SPLIT PHASED EB/WB LOMA VISTA DR.
2. INTERSECTION HAS FORCED LEAD/LAG FOR NB/SB LEFT TURNS FROM BECHELLI LN.
3. MITIGATION REQUIRED TO MITIGATE INTERSECTION LOS IMPACT.

LEFT TURN LANE
CROSSWALK
SIGNAL
BECHELLI LN
INTERSECTION 21
LOMA VISTA DR
CROSSWALK
SIGNALS
REMOVE EXISTING CROSSWALK
SIGNALS
LOMA VISTA DR
CROSSWALK
SIGNAL
CROSSWALK
LEFT TURN LANE
NORTH

Figure 1
SCALE: 1"=50'

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Intersection 21 - Bechelli Ln & Loma Vista Dr ***2040 PLUS PRJECT***

River Crossing Marketplace Development

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June 13, 2017
2226EX006.dwg

Appendix H: Loma-Vista Cut-Through Memorandum

Technical Memorandum No. 5

To:	City of Redding	**Date:**	February 16, 2018
Attn:	Kent Manual	**Project:**	River Crossing Marketplace Specific Plan (Costco Wholesale Development)
From:	Russ Wenham, P.E., T.E. Kamesh Vedula, P.E., T.E.		
Re:	Loma Vista Cut-Through	**Job No.:**	11145014
		File No.:	C2226MEM018.DOCX
CC:	Zachary Stinger, E.I.T.		

Introduction

Omni-Means, a GHD Company, has prepared this memorandum to present the results from an evaluation of the impact that the construction of the River Crossing Marketplace would have on Loma Vista Drive.

Existing Conditions

Loma Vista Drive is a two-lane, undivided, residential collector facility that connects Bechelli Lane and Churn Creek Road. Loma Vista Elementary School and the Neighborhood Church of Redding are both present on the southerly side of Loma Vista Drive. The roadway currently operates at a posted speed limit of 35 mph with a 25 mph school zone. Between Bechelli Lane and Churn Creek Road, Loma Vista Drive intersects with several residential roadways to create the following (signalized and stop-control) intersections:

- Loma Vista Drive & Bechelli Lane (stop signs on Loma Vista Drive)
- Loma Vista Drive & Dee Street (stop sign on Dee Street)
- Loma Vista Drive & Traverse Street (stop sign on Traverse Street)
- Loma Vista Drive & El Portal Drive (stop sign on El Portal Drive)
- Loma Vista Drive & Churn Creek Road (signalized)

Two school cross-walks are present, one at the Travers Street and one at the easterly school driveway.

There is sidewalk along the northerly side of the roadway between Bechelli Lane and Traverse Street. Along the southerly side, sidewalk is present between Traverse Street and Churn Creek Road. Loma Vista Drive varies from approximately 32-feet to 40-feet wide, with on-street parking permitted along some sections.

Existing Traffic Volumes

Traffic counts were performed on Wednesday, November 1, 2017 and Thursday, November 2, 2017, at two separate locations on Loma Vista Road. These traffic counts were used to gather the average daily traffic (ADT) and the AM and PM peak hour traffic flow. Of the two locations, the eastern count location had a higher ADT count of about 3,050 vehicles, an AM peak hour of about 450 vehicles, and a PM peak hour of 330. The western survey location had an ADT of about 2,100 vehicles, an AM peak hour of about 290 vehicles, and a PM peak hour of about 190 vehicles. This difference is due to parents entering and exiting Loma Vista Drive via Churn

Creek Road to drop off their kids at the elementary school. Therefore, the average ADT for Loma Vista Road is approximately 2,600 vehicles, an average AM peak hour of 370, and an average PM peak hour of 260 vehicles.

From the City of Redding Traffic Impact Analysis (TIA) Guidelines, the threshold for traffic on a residential collector is 4,000 vehicles per day and 360 vehicles per peak hour. Based on this criteria, Loma Vista Drive AM peak hour traffic volumes exceeds the TIA guideline volume.

Projected Traffic Volumes

Three percent of the River Crossing Marketplace traffic is projected to use Loma Vista Road as a cut-through. With the addition of this traffic, the ADT is projected to increase by 550 vehicles, assuming 275 vehicles in both the eastbound and westbound directions. The AM peak hour is projected to increase by 17 vehicles and the PM peak hour is projected to increase by 18 vehicles. This would bring the ADT of the roadway to approximately 3,150 vehicles, the average AM peak hour to approximately 390 vehicles, and the average PM peak hour to approximately 280 vehicles.

The Loma Vista Drive AM peak hour traffic volumes will continue to exceed the TIA guideline volume.

Impact Assessment

Due to the context of school, church and residential frontages, the increase in traffic volumes from the project is considered significant and requires mitigation.

Proposed Mitigation

The River Crossing Marketplace project will have impacts to the roadway by increasing traffic volumes on a roadway that already has more traffic than recommended in the City's TIA guidelines. At the November 27, 2017 and February 15, 2018 neighborhood meetings, attendees expressed concerns regarding the speed, safety, and congestion of the traffic on Loma Vista Drive.

The following mitigation measures will serve three purposes:

a) Reduction in vehicular speeds.
b) Reducing the desirability of the cut-thru traffic.
c) Improving pedestrian safety.

Proposed Mitigation Measures

MM for Loma Vista Drive – Prior to occupancy, the project developer shall complete the following improvements:

- ***Construct raised crosswalks at two locations on Loma Vista Drive.***
- ***Construct median pedestrian refuge islands at the crosswalks.***
- ***Construct curb bulb-outs at the raised crosswalks.***

The City of Redding shall implement by ordinance "No Parking" zones to accommodate the crosswalk improvements.

Additional supporting information:

1. Raised Crosswalks at School Crosswalks.

   A raised crosswalk is a raised portion of roadway similar to speed tables, but have

crosswalk markings on top. The implementations of raised crosswalks at the existing school crossings would increase visibility of pedestrians to motorists. Thereby encouraging drivers to slow down and yield to pedestrians. Additionally, the raised crosswalks would also function as speed tables and decrease travel speed.

2. Median Refuge Islands.

   Pedestrian refuge islands provide a center refuge for pedestrians as they traverse the roadway. Additionally, drivers would potentially slow down as the travel lane would narrow at the pedestrian refuge island. To accommodate this improvement, all on-street parking in front of Lassen View Elementary School would need to be eliminated. This improvement would provide safer crossing conditions for pedestrians by shortening the crossing distance. Pedestrian refuge islands would be implemented with raised crosswalks.

3. Curb Bulb-Outs at Crosswalks.

   Bulb-outs are curb extensions that extend the sidewalk into the roadway. They decrease the crossing distance, narrowing the roadway, and allow pedestrians to become more visible. This could potentially decrease vehicular speeds due to the narrower travel lanes while increasing pedestrian safety.

Appendix I: Left-Out Analysis for the Southern Bechelli Lane Driveway Memorandum

Technical Memorandum 3

To:	City of Redding	**Date:**	February 27, 2018
Attn:	Mr. Kent Manual	**Project:**	River Crossing Marketplace Specific Plan (Costco Wholesale Development)
From:	Russ Wenham, P.E., T.E. Kamesh Vedula, P.E., T.E.		
Re:	Left-Out Analysis for the Southern Bechelli Lane Driveway	**Job No.:**	25-1809-01
		File No.:	C2226MEM023.DOCX
CC:	Mr. Michael Okuma - Costco		

Introduction

The intersection of Bechelli Lane & Southern Driveway was analyzed as a right-in right-out with the most recent River Crossing Marketplace TIAR (dated November 2017). Omni-means was requested to analyze the operations at this driveway as a three-quarter access (right-in, right-out, and left-out). This Technical Memorandum analyzes the operations associated with three-quarter access at this Southern Driveway.

Operations

The City of Redding Traffic Impact Analysis (TIA) guidelines consider Level of Service (LOS) C as the standard acceptable threshold for the intersection of Bechelli Lane/Southern Driveway. The lane configuration for the driveway approach includes left turn and a right turn lane. The left out was analyzed with a receiving lane on Bechelli Lane to accommodate a two-stage gap acceptance.

Year 2020 Plus Project Conditions with the left out

The TIAR was analyzed with only a right out movement and had an intersection LOS B. With the addition of a left turn lane , under Year 2020 Plus Project conditions, the projected AM, PM, and Saturday peak hour LOS are LOS D (25 seconds of delay), LOS D (26.5 seconds of delay), and LOS C (21.4 seconds of delay), respectively. The intersection is projected to operate at unacceptable LOS during both the AM and PM peak hours under Year 2020 Plus Project conditions. The projected 95th percentile queue for the westbound left during the AM peak hour is 95 feet, PM peak hour is 105 feet, and Saturday peak hour is 88 feet.

The vehicle delay is all on-site and does not impact the traffic flow on public streets. The driveway also meets the minimum sight distance requirements and has the required throat depth. Therefore, the driveway functions properly and does not impact public streets in all conditions analyzed.

Year 2040 Plus Project Conditions with the left out

The TIAR was analyzed with only a right out movement and had an intersection LOS B. With the addition of a left turn lane , under Year 2040 Plus Project conditions, the projected AM, PM, and Saturday peak hour LOS are LOS E (35.5 seconds of delay), LOS E (48.9 seconds of

delay), and LOS D (30 seconds of delay), respectively. The intersection is projected to operate at unacceptable LOS during AM, PM, and Saturday peak hours under Year 2040 Plus Project conditions. The projected 95th percentile queue for the westbound left during the AM peak hour is 133 feet, PM peak hour is 170 feet, and Saturday peak hour is 125 feet.

The vehicle delay is all on-site and does not impact the traffic flow on public streets. The driveway also meets the minimum sight distance requirements and has the required throat depth. Therefore, the driveway functions properly and does not impact public streets in all conditions analyzed.

Year 2040 Plus Project with Redding Rancheria Conditions with the left out

Based on the analysis for Year 2040 Plus Project conditions, AM and PM peak hours were only analyzed under the Year 2040 Plus Project with Redding Rancheria conditions as these were identified to be the worst performing.

Under Year 2040 Plus Project with Redding Rancheria conditions, the projected AM and PM peak hour LOS are LOS E (37.1 seconds of delay) and LOS F (54.3 seconds of delay), respectively. The intersection is projected to operate at unacceptable LOS during both the AM and PM peak hours under Year 2040 Plus Project with Redding Rancheria conditions. The projected 95th percentile queue for the westbound left during the AM peak hour is 138 feet and PM peak hour is 183 feet.

The vehicle delay is all on-site and does not impact the traffic flow on public streets. The driveway also meets the minimum sight distance requirements and has the required throat depth. Therefore, the driveway functions properly and does not impact public streets in all conditions analyzed.

Impacts to Adjacent Intersections

Based on City of Redding TIA Guidelines 3.5A, impacts to other driveways and intersections need to be analyzed. Therefore, the queuing at the intersection of Bechelli Lane & Blue Shield/ Costco Driveway was analyzed for Year 2040 Plus Project conditions as Year 2040 is projected to be worse than Year 2020 conditions. All queues were developed based on an average vehicle length of 25 feet and Synchro modeling software.

Year 2040 Plus Project Conditions with the left out

The intersection of Bechelli Lane & Blue Shield Driveway/Costco Driveway is located approximately 345 feet to the north of the proposed location for the Southern Driveway. Currently, the northbound left turn pocket is 290 feet in length. The current storage accommodates AM, PM, and Saturday peak hour 95th percentile queues that are projected to be 185, 38, and 22 feet, respectively.

The northbound through 95th percentile is projected to be 303, 324, 243 feet during the AM, PM, and Saturday peak hours, respectively. During the AM and PM peak hours, the 95th percentile queues are barely accommodated within the available storage.

Year 2040 Plus Project with Redding Rancheria Conditions with the left out

The intersection of Bechelli Lane/Blue Shield Driveway/Costco Driveway is located approximately 345 feet to the north of the proposed location for the Southern Driveway. Currently, the northbound left turn pocket is 290 feet in length. The current storage accommodates AM and PM peak hour queues that are projected to be 138 and 183 feet, respectively.

The northbound through 95th percentile is projected to be 310 and 340 feet for the AM and PM peak hours, respectively. The 95th percentile queues are accommodated within the available storage.

Recommendations

To ensure a left out movement can be accommodated when queues could potentially spillback and affect operations at the intersection of Bechelli Lane/Southern Driveway, “Keep Clear” markings are recommended at the intersection of Bechelli Lane/Southern Driveway. This will allow the left turn movement out of the project site to occur when the projected queue spillback would otherwise block the intersection of Bechelli Lane & Southern Driveway. Additionally, queue detectors are recommended for the northbound left turn lane of the Bechelli Lane/BlueShield Driveway/Costco Driveway intersection to extend the northbound green time to minimize the instances when the queue spillback affects the downstream intersection.

The attached figure presents an updated preliminary design that accommodates the three-quarter intersection.

Conclusions

With the recommended improvements, a left out at the intersection of Bechelli Lane/Southern Driveway could be provided during the AM, PM, and Saturday peak hours for Year 2040 Plus Project and Year 2040 Plus Project with Redding Rancheria conditions.

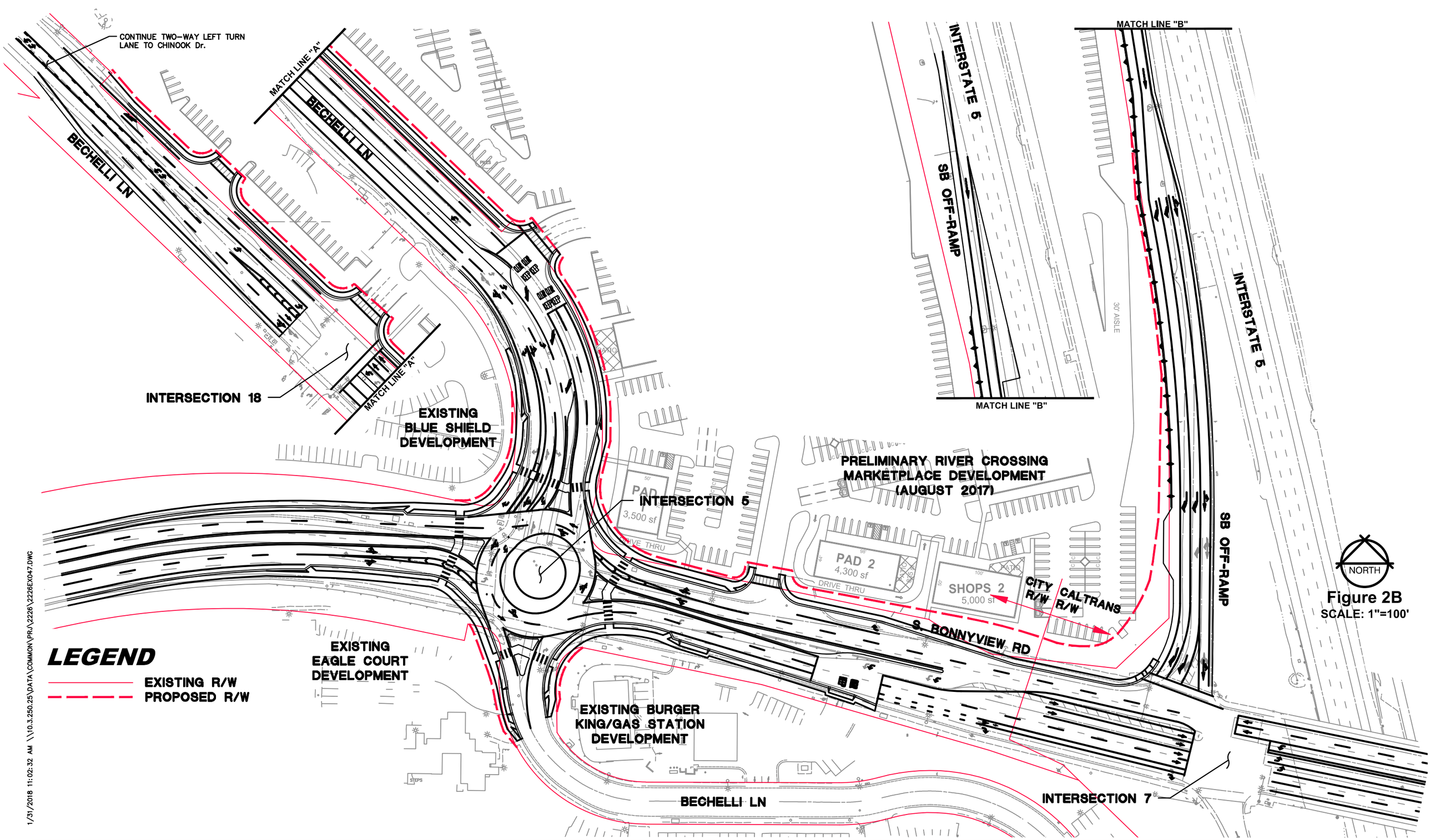

Figure 2B
SCALE: 1"=100'

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Off-Site Mitigations - S. Bonnyview Rd/Bechelli Ln Details - Roundabout Alternative

River Crossing Marketplace Development

omni·means A GHD Company

January 23, 2018
2226EX047.dwg

Appendix J: Proposed and “Plus Rancheria” Impacts Comparison Memorandum

Memorandum

To:	City of Redding	**Date:**	October 10, 2019
Attn:	Kent Manuel	**Project:**	River Crossing Marketplace Specific Plan (Costco Wholesale Development)
From:	Russ Wenham, PE, TE, PTOE Kamesh Vedula, PE, TE		
Re:	Proposed Project and "Plus Rancheria" Impacts Comparison	**Job No.:**	11145014
CC:	Zachary Stinger, EIT	**File No.:**	C2226MEM019.DOCX

Introduction

GHD, formerly Omni-Means, has prepared this memorandum to accompany the River Crossing Marketplace Specific Plan Traffic Impact Analysis Report (TIAR) dated September 2019. This memorandum presents a quantitative analysis by comparing the:

- Year 2040 Plus Project conditions - From the TIAR, and
- Year 2040 with Redding Rancheria (Rancheria) Plus Project conditions - From the October 9, 2019 "Impacts from Proposed Redding Rancheria" memorandum, GHD.

This technical memorandum presents:

- Year 2040 Plus Project conditions
- Year 2040 with Rancheria Plus Project conditions

Comparison of Conditions

The following sections compare the operations of the Year 2040 Plus Project conditions with the Year 2040 with Rancheria Plus Project conditions.

Intersection Operations

Table 1A below presents a comparison of the intersection operations for the Year 2040 Plus Project and Year 2040 with Rancheria Plus Project conditions during the AM peak hour.

TABLE 1A
AM PEAK HOUR INTERSECTION OPERATIONS COMPARISON

#	Intersection	Control Type[1,2]	Target LOS	Year 2040 Plus Project			Year 2040 with Rancheria Plus Project		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	39.9	D	-	41.5	D	-
2	S. Bonnyview Rd/ Eastside Rd	Signal	D	39.1	D	-	42.2	D	-
3	S. Bonnyview Rd/ E. Bonnyview Rd	Signal	D	40.9	D	-	50.4	D	-
4	S. Bonnyview Rd/ Indianwood Dr	Signal	D	7.0	A	-	7.1	A	-
5	S. Bonnyview Rd/ Bechelli Ln	Signal	D	58.6	E	-	65.1	E	-
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	20.5	C	-	23.2	C	-
6B	**S. Bonnyview Rd/ S. Bonnyview Dwy**	**TWSC**	**D**	32.2	D	-	**52.6**	**F**	**No**
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	83.5	F	-	83.8	F	-
8	S. Bonnyview Rd/ I-5 NB Ramps	Signal	D	59.2	E	-	70.6	E	-
9	S. Bonnyview Rd/ Churn Creek Rd	Signal	D	36.7	D	-	42.4	D	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	14.5	B	-	14.8	B	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	61.6	F	No	67.2	F	No
12	Churn Creek Rd/ Huntington Dr	TWSC	D	45.8	E	No	48.8	E	No
13	Churn Creek Rd/ Victor Ave	TWSC	D	84.5	F	Yes	98.0	F	Yes
14	Churn Creek Rd/ Rancho Rd	TWSC	C	45.7	E	Yes	51.0	F	Yes
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	18.1	C	-	18.7	C	-
16	Rancho Rd/ Shasta View Dr	TWSC	C	143.6	F	No	164.1	F	No
17	Rancho Rd/ Airport Rd	Signal	C	41.0	D	-	42.6	D	-
18	Blue Shield Dwy/ Middle Dwy	Signal	C	19.7	B	-	19.7	B	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	14.0	B	-	14.2	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	16.3	C	-	16.6	C	-
21	Bechelli Ln/ Loma Vista Dr	TWSC	C	116.9	F	Yes	160.2	F	Yes
22	Bechelli Ln/ Hartnell Ave	Signal	C	34.7	C	-	34.9	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	18.3	B	-	18.3	B	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	14.1	B	-	14.1	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	21.6	C	-	21.8	C	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	34.6	C	-	34.7	C	-
27	Churn Creek Rd/ Hartnell Ave	Signal	C	59.7	E	-	60.0	E	-
28	Bechelli Ln/ Northern Dwy	TWSC	C	20.2	C	-	21.0	C	-
29	Bechelli Ln/ Southern Dwy	TWSC	C	35.5	E	-	36.9	E	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

*4. **Bold** = Additional Impact for Year 2040 with Rancheria Plus Project*

5. OVR = Delay exceeds 300 seconds

As presented in Table 1A, all Year 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts except the following intersection:

- Intersection 6B – S. Bonnyview Road & S. Bonnyview Driveway (Deteriorates from LOS D to LOS F)

Table 1B below presents a comparison of the intersection operations for the Year 2040 Plus Project and Year 2040 with Rancheria Plus Project conditions during the PM peak hour.

TABLE 1B
PM PEAK HOUR INTERSECTION OPERATIONS COMPARISON

#	Intersection	Control Type[1,2]	Target LOS	Year 2040 Plus Project			Year 2040 with Rancheria Plus Project		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	39.3	D	-	40.5	D	-
2	S. Bonnyview Rd/ Eastside Rd	Signal	D	50.9	D	-	54.2	D	-
3	S. Bonnyview Rd/ E. Bonnyview Rd	Signal	D	45.7	D	-	53.4	D	-
4	S. Bonnyview Rd/ Indianwood Dr	Signal	D	10.2	B	-	10.3	B	-
5	S. Bonnyview Rd/ Bechelli Ln	Signal	D	76.3	E	-	152.3	F	-
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	35.8	E	No	49.8	E	No
6B	**S. Bonnyview Rd/ S. Bonnyview Dwy**	**TWSC**	**D**	28.8	D	-	**51.4**	**F**	**No**
7	S. Bonnyview Rd/ I-5 SB Ramps	Signal	D	114.7	F	-	114.9	F	-
8	**S. Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	40.9	D	-	**77.8**	**E**	**-**
9	S. Bonnyview Rd/ Churn Creek Rd	Signal	D	33.7	C	-	45.5	D	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	25.7	D	-	26.4	D	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	107.3	F	Yes	125.1	F	Yes
12	Churn Creek Rd/ Huntington Dr	TWSC	D	37.1	E	No	39.5	E	No
13	Churn Creek Rd/ Victor Ave	TWSC	D	OVR	F	Yes	OVR	F	Yes
14	Churn Creek Rd/ Rancho Rd	TWSC	C	72.2	F	Yes	90.6	F	Yes
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	15.1	C	-	15.6	C	-
16	Rancho Rd/ Shasta View Dr	TWSC	C	89.6	F	No	110.0	F	No
17	Rancho Rd/ Airport Rd	Signal	C	26.4	C	-	26.9	C	-
18	Blue Shield Dwy/ Middle Dwy	Signal	C	24.8	C	-	25.0	C	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	16.2	C	-	16.6	C	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	15.9	C	-	16.4	C	-
21	Bechelli Ln/ Loma Vista Dr	TWSC	C	OVR	F	Yes	OVR	F	Yes
22	Bechelli Ln/ Hartnell Ave	Signal	C	34.9	C	-	35.0	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	24.1	C	-	24.1	C	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	13.4	B	-	13.4	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	17.5	B	-	17.7	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	14.5	B	-	14.5	B	-
27	Churn Creek Rd/ Hartnell Ave	Signal	C	60.4	E	-	60.8	E	-
28	Bechelli Ln/ Northern Dwy	TWSC	C	36.5	E	-	39.5	E	No
29	Bechelli Ln/ Southern Dwy	TWSC	C	48.9	E	-	52.8	F	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

*4. **Bold** = Additional Impact for Year 2040 with Rancheria Plus Project*

5. OVR = Delay exceeds 300 seconds

As presented in Table 1B, all Year 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts except the following intersections:

- Intersection 6B – S. Bonnyview Road & S. Bonnyview Driveway (Deteriorates from LOS D to LOS F)
- Intersection 8 – S. Bonnyview Road & Interstate 5 Northbound Ramps (Deteriorates from LOS D to LOS E)

Table 1C below presents a comparison of the intersection operations for the Year 2040 Plus Project and Year 2040 with Rancheria Plus Project conditions during the Saturday peak hour.

TABLE 1C
SATURDAY PEAK HOUR INTERSECTION OPERATIONS COMPARISON

#	Intersection	Control Type[1,2]	Target LOS	Year 2040 Plus Project			Year 2040 with Rancheria Plus Project		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	29.4	C	-	31.5	C	-
2	S. Bonnyview Rd/ Eastside Rd	Signal	D	25.7	C	-	26.6	C	-
3	S. Bonnyview Rd/ E. Bonnyview Rd	Signal	D	17.8	B	-	18.2	B	-
4	S. Bonnyview Rd/ Indianwood Dr	Signal	D	7.9	A	-	8.0	A	-
5	**S. Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	31.6	C	-	**128.7**	**F**	-
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	19.4	C	No	25.6	D	No
6B	**S. Bonnyview Rd/ S. Bonnyview Dwy**	**TWSC**	**D**	25.9	D	-	**65.6**	**F**	**No**
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	32.7	C	-	**55.4**	**E**	-
8	**S. Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	27.9	C	-	**63.0**	**E**	-
9	S. Bonnyview Rd/ Churn Creek Rd	Signal	D	28.6	C	-	29.3	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	15.9	C	-	16.3	C	-
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	23.2	C	Yes	25.0	D	Yes
12	Churn Creek Rd/ Huntington Dr	TWSC	D	52.1	F	Yes	60.5	F	Yes
13	Churn Creek Rd/ Victor Ave	TWSC	D	54.2	F	Yes	67.6	F	Yes
14	Churn Creek Rd/ Rancho Rd	TWSC	C	14.9	B	Yes	16.0	C	Yes
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	12.9	B	-	13.5	B	-
16	Rancho Rd/ Shasta View Dr	TWSC	C	22.0	C	No	25.7	D	No
17	Rancho Rd/ Airport Rd	Signal	C	18.2	B	-	18.6	B	-
18	Blue Shield Dwy/ Middle Dwy	Signal	C	22.3	C	-	22.7	C	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	12.9	B	-	13.3	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	12.1	B	-	12.4	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	24.0	C	Yes	**26.9**	**D**	**Yes**
22	Bechelli Ln/ Hartnell Ave	Signal	C	24.4	C	-	24.7	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	24.4	C	-	24.5	C	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	12.0	B	-	12.0	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	15.4	B	-	15.4	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	11.2	B	-	11.2	B	-
27	Churn Creek Rd/ Hartnell Ave	Signal	C	34.1	C	-	34.1	C	-
28	Bechelli Ln/ Northern Dwy	TWSC	C	24.7	C	-	24.7	C	No
29	Bechelli Ln/ Southern Dwy	TWSC	C	30.0	D	-	32.3	D	-

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

*4. **Bold** = Additional Impact for Year 2040 with Rancheria Plus Project*

5. OVR = Delay exceeds 300 seconds

As presented in Table 1C, all Year 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts except the following intersections:

- Intersection 5 – S. Bonnyview Road & Bechelli Lane
  (Deteriorates from LOS C to LOS F)
- Intersection 6B – S. Bonnyview Road & S. Bonnyview Driveway
  (Deteriorates from LOS D to LOS F)
- Intersection 7 – S. Bonnyview Road & Interstate 5 Southbound Ramps
  (Deteriorates from LOS C to LOS E)
- Intersection 8 – S. Bonnyview Road & Interstate 5 Northbound Ramps
  (Deteriorates from LOS C to LOS E)

- Intersection 21 – Bechelli Lane & Loma Vista Drive
  (Deteriorates from LOS C to LOS D)

All new impacts during the Saturday peak hour are projected to occur in the AM and PM peak hours.

Roadway Segment Operations

Table 2A below presents a comparison of the roadway segment operations for the Year 2040 Plus Project and the Year 2040 with Rancheria Plus Project conditions during the AM peak hour.

TABLE 2A
AM PEAK HOUR ROADWAY OPERATIONS COMPARISON

#	Roadway Segment	Capacity Configuration	Target LOS	Year 2040 Plus Project		Year 2040 with Rancheria Plus Project	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	14.2	E	14.8	E
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	722	F	738	F
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	458	B	472	C
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	C	485	C	492	C
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	558	B	566	C
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	413	A	415	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	218	A	218	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

4. ***Bold*** *= Additional Impact for Year 2040 with Rancheria Plus Project*

As presented in Table 2A, all Year 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts.

Table 2B below presents a comparison of the roadway segment operations for the Year 2040 Plus Project and the Year 2040 with Rancheria Plus Project conditions during the PM peak hour.

TABLE 2B
PM PEAK HOUR ROADWAY OPERATIONS COMPARISON

#	Roadway Segment	Capacity Configuration	Target LOS	Year 2040 Plus Project		Year 2040 with Rancheria Plus Project	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	16.3	E	12.5	F
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	766	F	781	F
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	416	B	434	B
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	C	672	E	689	F
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	760	E	781	E
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	438	A	442	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	253	A	253	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

4. ***Bold*** *= Additional Impact for Year 2040 with Rancheria Plus Project*

As presented in Table 2B, all Year 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts, as there are no new impacts. However, the following roadway segments had an already unacceptable LOS degrade to a worse LOS:

- Segment 1 – S. Bonnyview Road between State Route 273 and Churn Creek Road (Deteriorates from LOS E to LOSF)
- Segment 4 – Bechelli Lane between S. Bonnyview Road and Chinook Drive (Deteriorates from LOS E to LOSF)

Table 2C below presents a comparison of the roadway segment operations for the Year 2040 Plus Project and the Year 2040 with Rancheria Plus Project conditions during the Saturday peak hour.

TABLE 2C
SATURDAY PEAK HOUR ROADWAY OPERATIONS COMPARISON

#	Roadway Segment	Capacity Configuration	Target LOS	Year 2040 Plus Project		Year 2040 with Rancheria Plus Project	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	S. Bonnyview Rd between SR 273 & Churn Creek Rd	Divided Arterial	D	22.4	C	17.2	D
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	522	C	548	D
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	313	A	337	A
4	Bechelli Ln between S. Bonnyview Rd & Chinook Dr	Undivided Arterial	C	460	B	487	C
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	403	A	433	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	304	A	304	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	205	A	205	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

4. ***Bold*** *= Additional Impact for Year 2040 with Rancheria Plus Project*

As presented in Table 2C, all Year 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts, as there are no new impacts.

Freeway and Ramp Operations

Table 3A below presents a comparison of the ramp merge, diverge, and freeway mainline operations for the Year 2040 Plus Project and Year 2040 with Rancheria Plus Project conditions during the AM peak hour.

TABLE 3A
AM PEAK HOUR RAMP AND FREEWAY OPERATIONS COMPARISON

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	Year 2040 Plus Project			Year 2040 with Rancheria Plus Project		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)									
1	Cypress Ave Off Ramp NB	D	Diverge	1	970	28.0	C	979	28.4	D
2	S. Bonnyview Rd to Cypress Ave NB	D	Mainline	3	3,909	23.1	C	3,996	23.7	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	1,081	26.1	C	1,168	26.8	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	921	25.3	C	1,088	26.6	C
5	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	3	3,749	22.2	C	3,916	23.2	C
6	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	2	3,749	38.0	E	3,916	41.3	E
7	Knighton Rd On Ramp NB	D	Merge	1	267	36.2	E	277	37.7	E
8	Knighton Rd Off Ramp SB	D	Diverge	1	229	22.7	C	233	23.5	C
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	2,244	19.9	B	2,317	20.5	B
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	2,244	13.3	B	2,317	13.7	B
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	632	17.4	B	705	18.0	B
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	1,014	19.8	B	1,212	21.5	B
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	2,626	15.5	B	2,824	16.7	B
14	Cypress Ave On Ramp SB	D	Merge	1	434	17.4	B	449	18.4	B

Notes:

Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln

Bold *text indicates an additional impact for Year 2040 with Rancheria Plus Project*

As presented in Table 3A, all 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts.

Table 3B below presents a comparison of the ramp merge, diverge, and freeway mainline operations for the Year 2040 Plus Project and Year 2040 with Rancheria Plus Project conditions during the PM peak hour.

TABLE 3B
PM PEAK HOUR RAMP AND FREEWAY OPERATIONS COMPARISON

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	Year 2040 Plus Project			Year 2040 with Rancheria Plus Project		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)									
1	Cypress Ave Off Ramp NB	D	Diverge	1	738	22.8	C	755	23.8	C
2	S. Bonnyview Rd to Cypress Ave NB	D	Mainline	3	3,061	18.1	B	3,232	19.1	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	1,140	21.1	C	1,311	22.4	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	756	18.8	B	970	20.6	C
5	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	3	2,677	15.8	B	2,891	17.1	B
6	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	2	2,677	23.8	C	2,891	26.0	D
7	Knighton Rd On Ramp NB	D	Merge	1	321	26.4	D	334	28.4	D
8	Knighton Rd Off Ramp SB	D	Diverge	1	381	39.0	E	390	40.4	E
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	3,879	40.6	E	4,024	43.7	E
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	3,879	23.0	C	4,024	23.9	C
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	1,050	26.5	C	1,195	27.7	C
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	992	25.9	C	1,244	27.8	C
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	3,821	22.6	C	4,073	24.2	C
14	Cypress Ave On Ramp SB	D	Merge	1	1,009	24.8	C	1,028	26.1	C

Notes:

Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln

Bold *text indicates an additional impact for Year 2040 with Rancheria Plus Project*

As presented in Table 3B, all 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts.

Table 3C below presents a comparison of the ramp merge, diverge, and freeway mainline operations for the Year 2040 Plus Project and Year 2040 with Rancheria Plus Project conditions during the Saturday peak hour.

TABLE 3C
SATURDAY PEAK HOUR RAMP AND FREEWAY OPERATIONS COMPARISON

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	Year 2040 Plus Project			Year 2040 with Rancheria Plus Project		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)									
1	Cypress Ave Off Ramp NB	D	Diverge	1	249	25.0	C	270	26.2	C
2	S. Bonnyview Rd to Cypress Ave NB	D	Mainline	3	3,622	21.4	C	3,836	22.7	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	984	23.5	C	1,198	25.2	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	636	22.0	C	864	23.7	C
5	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	3	3,274	19.3	B	3,502	20.7	B
6	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	2	3,274	30.6	D	3,502	33.8	D
7	Knighton Rd On Ramp NB	D	Merge	1	334	31.8	D	349	33.8	D
8	Knighton Rd Off Ramp SB	D	Diverge	1	312	36.0	E	322	37.6	E
9	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	2	3,580	35.1	E	3,740	37.9	E
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	3,580	21.2	C	3,740	22.1	C
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	637	23.7	C	797	24.9	C
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	788	25.0	C	1,091	27.2	C
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	3,731	22.1	C	4,043	24.0	C
14	Cypress Ave On Ramp SB	D	Merge	1	394	23.0	C	417	24.6	C

Notes:

Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates an additional impact for Year 2040 with Rancheria Plus Project*

As presented in Table 3C, all 2040 with Rancheria Plus Project impacts are consistent with Year 2040 Plus Project impacts.

"With Rancheria" Additional Mitigation Measures

This section presents recommended mitigation measures for study intersections with impacts for Year 2040 with Rancheria Plus Project conditions. These mitigations are in addition to the mitigations recommended in the River Crossing Marketplace TIAR. If no additional mitigations are listed, the previously identified improvements mitigate the significantly impacted intersections.

Intersections

The following improvements are proposed to provide acceptable operations at intersections where a project significant impact was identified for the Year 2040 with Rancheria Plus Project conditions.

Intersection 5 - S. Bonnyview Road & Bechelli Lane

The following mitigations, in addition to the mitigations recommended in the River Crossing Marketplace Specific Plan TIAR, are required for S. Bonnyview Road & Bechelli Lane for the Year 2040 with Rancheria Plus Project conditions:

- Provide Improvements recommended under Year 2040 Plus Project conditions
- Widen the eastbound approach to provide:
    - Two left-turn lanes of length 400 feet
    - Three thru lanes of length 400 feet
    - One right-turn pocket of length 350 feet
- Widen the westbound approach to provide:
    - Two left-turn pockets of length 200 feet

OR

- Construct a multi-lane roundabout

Roadway Segments

No additional roadway segment mitigations are required with the buildout of the Rancheria.

Freeway Mainline and Ramp Segments

No additional freeway mainline and ramp segment mitigations are required with the buildout of the Rancheria.

Appendix

The following appendix contains the October 9, 2019 "Impacts from Proposed Redding Rancheria" memorandum excluding its associated appendix.

The "Impacts from Proposed Redding Rancheria" memorandum complete with its appendix is included in the Environmental Impact Report (EIR).

Appendix for C2226MEM019 w Saturday

Appendix: Impacts from Proposed Redding Rancheria Memorandum

Appendix: Impacts from Proposed Redding Rancheria Memorandum

Memorandum

To:	City of Redding	**Date:**	October 9, 2019
Attn:	Kent Manuel	**Project:**	River Crossing Marketplace Specific Plan (Costco Wholesale Development)
From:	Russ Wenham, PE, TE, PTOE Kamesh Vedula, PE, TE		
Re:	Impacts from Proposed Redding Rancheria	**Job No.:**	11145014
		File No.:	C2226MEM017.DOCX
CC:	John Abshier, P.E., Michael Okuma		

Introduction

The City of Redding retained GHD, formerly Omni-Means, to perform a Traffic Impact Analysis Memorandum of the Redding Rancheria as it relates to the Costco River Crossing Marketplace Specific Plan Traffic Impact Analysis Report (TIAR) dated September 2019. Based on the direction from the City Staff, the following scenarios were analyzed:

- Year 2040 with Rancheria conditions
- Year 2040 with Rancheria Plus Project conditions

Rancheria Project Description

The term "Rancheria," as used in this memorandum, refers to the Redding Rancheria development as presented in the Kimley-Horn Associate (KHA) *July 2017 Traffic Impact Study – Redding Rancheria* (KHA TIS). As part of Rancheria, four alternatives at the planned site were considered. The alternatives include the following:

- **Alternative A: Proposed Project** – Consists of a new casino and resort, including an approximately 69,515 square foot casino, a 250-room hotel, an event/convention center, and a retail center, as well as associated parking and infrastructure.
- **Alternative B: Proposed Project with No Retail** – Consists of the same land uses and intensities as the Proposed Project without the retail center.
- **Alternative C: Reduced Intensity Alternative** – Consists of a reduced version of the Proposed Project including a new casino and resort, an approximately 250-room hotel, an event/convention center, and a retail center, as well as associated parking and infrastructure.
- **Alternative D: Non-Gaming Alternative** – Consists of an approximately 128-room hotel, restaurants, and a retail center, as well as associated parking and infrastructure.

Alternative A is the only alternative analyzed in this memorandum.

Site Access

As part of Rancheria, three project access options were evaluated for each development alternative (A through D). The access options are listed below:

- Option 1 (North Access Only) – access to South Bonnyview Road via Bechelli Lane
- Option 2 (North and South Access) – access to South Bonnyview Road via Bechelli Lane and access to Smith Road via a new connecting roadway (overpass only at Smith Road).

- Option 3 (South Access Only) – access to Smith Road via a new connecting roadway and a new I-5 Interchange at Smith Road.

To be conservative, Option 1 is the only site access assumed in this memorandum, as all trips generated by the Rancheria travel through the study intersections in that option.

Rancheria Trip Generation

The Rancheria trip generation is based on the KHA TIS for the AM and PM peak hours. The Saturday Rancheria trip generation is based on the methodology presented in the GHD September 2019 *Redding Rancheria (Strawberry Fields) Development – Saturday Trip Generation Methodology Memorandum*.

Rancheria Trip Distribution

The Rancheria trip distribution is based on the KHA TIS for the AM, PM, and Saturday peak hours.

Project Description

The term "project", as used in this memorandum, refers to the development as follows:

- Location: ± 25.16 acres east of Bechelli Lane, north of S. Bonnyview Road, west of I-5, and south of Rivercrest Estates subdivision.
    - Land Use Quantities:
        - ± 152,101 sq. ft. Costco
        - ± 70,100 sq. ft. General Commercial Retail
        - 30 fueling positions
- Access to the project will be via three (3) proposed driveways along Bechelli Lane and one (1) proposed driveway along S. Bonnyview Road.
    - One full-access unsignalized driveway on Bechelli Lane (northern driveway).
    - One full-access signalized driveway on Bechelli Lane at the existing Blue Shield Driveway (middle driveway).
    - One unsignalized driveway with Right-In/Right-Out (RIRO) access on Bechelli Lane (southern driveway).
    - One unsignalized driveway with RIRO access on S. Bonnyview Road (S. Bonnyview driveway).

Project Trip Generation

The project trip generation is consistent with the River Crossing Marketplace Report.

Project Trip Distribution

The proposed project trip distribution is consistent with the River Crossing Marketplace Report.

Level of Service Methodologies and Guidelines

The following section presents a summary of the general level of service (LOS) methodologies and guidelines used in the analysis of intersections, freeway segments, and roadway segments.

General LOS Methodologies

Intersection and ramp LOS was calculated for all control types (e.g. signalization, stop sign controlled) using the methods documented in the Transportation Research Board publications of the 2000 and 2010 *Highway Capacity Manual (HCM)*. LOS determinations are presented on a letter grade scale from “A” to “F”, whereby LOS “A” represents “free-flow” conditions and LOS “F” represents over capacity conditions.

Freeway Mainline and Ramp LOS Methodologies

Mainline and ramp LOS was calculated using HCS 2010 software by McTrans. LOS was calculated on a density basis in passenger cars per mile per lane (pc/mi/ln). Table 1 below presents the LOS thresholds for ramps in the study area.

TABLE 1
LOS CRITERIA FOR FREEWAY MAINLINE SEGMENTS AND RAMPS

BASIC FREEWAY SEGMENTS		RAMP MERGE AND DIVERGE AREAS	
LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
A	0 - 11	A	≤ 10
B	> 11 - 18	B	> 10 - 20
C	> 18 - 26	C	> 20 - 28
D	> 26 - 35	D	> 28 - 35
E	35 - 45	E	> 35
F	> 45	F	Demand exceeds capacity

References: 2010 Highway Capacity Manual

Intersection LOS Methodologies

The LOS was calculated for all intersection control types using the methods documented in the HCM 2000 and 2010. LOS is a qualitative measure of traffic operating conditions, whereby a letter grade A through F is assigned to an intersection or roadway segment representing progressively worsening traffic conditions.

For signalized intersections, intersection delays and LOS are average values for all intersection movements. For two-way stop-controlled (TWSC) intersections, the intersection delays and LOS are represented by the worst approach. Table 2 on the following page presents the delay-based LOS criteria for different types of intersection control.

TABLE 2
LOS CRITERIA FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle (sec)	
				Signalized/ Roundabouts	Unsignalized/ All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10.0	≤ 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤ 20.0	>10 and ≤ 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20 and ≤ 35.0	>15 and ≤ 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤ 55.0	>25 and ≤ 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and ≤ 80.0	>35 and ≤ 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0

References: 2010 Highway Capacity Manual

Arterial LOS Methodologies

LOS was calculated for the seven roadway/arterial segments by using the methods documented in Section 4.5.E of the City of Redding Traffic Impact Analysis (TIA) Guidelines, published in January 2009. As outlined within this section, the following two methods may be used to obtain roadway level of service:

Method 1 is based on the average travel speed and the methods presented in Chapter 15 of HCM (2010). This method is not intended for application to a short roadway segment. While this method determines the directional LOS for each individual segment along a roadway, only the over-all directional LOS shall be used for identifying project impacts. The results for individual segments along the overall roadway shall be provided for information only.

Method 2 uses the peak hour service volumes presented in Table 3 on the following page.

TABLE 3
MAXIMUM PEAK HOUR VOLUME PER LANE

#	Roadway Type	Maximum Peak Hour Volume Per Lane				
		LOS				
		A	B	C	D	E
1	Expressway - High Access Control	570	660	760	850	950
2	Expressway - Moderate Access Control	520	610	700	790	870
3	Divided Arterial (w/LTL)	500	560	650	730	810
4	Undivided Arterial (no LTL)	410	470	540	610	680
5	Collector	270	340	410	470	540

Notes
1. Based on HCM 2000 Chapter 10.

For all scenarios, Method 1 was used to obtain the arterial LOS for the S. Bonnyview Corridor between State Route 273 and Churn Creek Road. As this segment of S. Bonnyview Road spans approximately two miles and nine intersections, this corridor is not classified as a short roadway segment. For each scenario, the overall directional average travel speed and LOS is reported for the direction in which the minimum travel time is recorded.

For all scenarios, Method 2 was used to obtain the arterial LOS of all roadway segments except for S. Bonnyview Corridor between SR 273 and Churn Creek Road. For each roadway segment, the existing geometric configuration was used to determine the roadway type. The maximum directional peak hour volume per lane was used to determine the roadway LOS.

Agency LOS Guidelines and Policies

City of Redding LOS Guidelines

The City of Redding's General Plan Transportation Element contains the following policy pertaining to LOS standards in the City:

> *Policy T1A: Establish the following peak-hour LOS standards for transportation planning and project review. They reflect the special circumstances of various areas of the community:*
>
> - *Use LOS "C" – for most arterial streets and their intersections.*
> - *Use LOS "D" – for the Downtown area where vitality, activity, and pedestrian and transit use are primary goals.*
> - *Use LOS "D" – for streets within the State highway system and interchanges.*
> - *Use LOS "D" – for river-crossing street corridors whose capacity is affected by adjacent intersections.*

The City of Redding General Plan Transportation Element is accessible via the following internet site: *http://www.cityofredding.org/home/showdocument?id=5513.*

Shasta County LOS Guidelines

Shasta County's General Plan Circulation Element contains the following policy pertaining to LOS standards in the County:

> *C-6l New development which may result in exceeding LOS E on existing facilities shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated. Such mitigation may take the form of, but not limited to the following:*

- *Provision of capacity improvements to the specific road link to be impacted, the transit system, or any reasonable combination;*
- *Provision of demand reduction measures included as part of the project design or project operation or any feasible combination.*

Caltrans LOS Guidelines

The Caltrans published *Guide for the Preparation of Traffic Impact Studies* (dated December 2002) states the following:

> *"Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS."*

Consistent with the agencies' policies, this study will consider LOS "C" and LOS "D" as the standard acceptable threshold for all intersections in the jurisdiction of the City of Redding, LOS "E" as the standard acceptable threshold for all intersections in the jurisdiction of Shasta County, and LOS "D" as the standard acceptable threshold for all intersections in the jurisdiction of Caltrans. Table 4 below presents the intersection, jurisdiction, and LOS threshold for each of the study intersections.

TABLE 4
INTERSECTION LEVEL OF SERVICE THRESHOLD AND JURISDICTION

#	Intersection	Jurisdiction	Target LOS
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Caltrans	D
2	S. Bonnyview Rd/ Eastside Rd	City of Redding	D
3	S. Bonnyview Rd/ E. Bonnyview Rd	City of Redding	D
4	S. Bonnyview Rd/ Indianwood Dr	City of Redding	D
5	S. Bonnyview Rd/ Bechelli Ln	City of Redding	D
6	S. Bonnyview Rd/ Texaco Dwy	City of Redding	D
7	S. Bonnyview Rd/ I-5 SB Ramps	Caltrans	D
8	S. Bonnyview Rd/ I-5 NB Ramps	Caltrans	D
9	S. Bonnyview Rd/ Churn Creek Rd	City of Redding	D
10	Churn Creek Rd/ Alrose Ln	City of Redding	D
11	Churn Creek Rd/ Hartmeyer Ln	Shasta County	E
12	Churn Creek Rd/ Huntington Dr	City of Redding	D
13	Churn Creek Rd/ Victor Ave	City of Redding	D
14	Churn Creek Rd/ Rancho Rd	City of Redding	C
15	Rancho Rd/ Alta Mesa Dr	City of Redding	C
16	Rancho Rd/ Shasta View Dr	City of Redding	C
17	Rancho Rd/ Airport Rd	City of Redding	C
18	Bechelli Ln/ Blue Shield Dwy	City of Redding	C
19	Bechelli Ln/ Chinook Dr	City of Redding	C
20	Bechelli Ln/ Rivercrest Pkwy	City of Redding	C
21	Bechelli Ln/ Loma Vista Dr	City of Redding	C
22	Bechelli Ln/ Hartnell Ave	City of Redding	C
23	Churn Creek Rd/ Public ROW to Chevron	City of Redding	C
24	Churn Creek Rd/ Arizona Ln	City of Redding	C
25	Churn Creek Rd/ Loma Vista Dr	City of Redding	C
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	City of Redding	C
27	Churn Creek Rd/ Hartnell Ave	City of Redding	C

Mitigations and Fees

In accordance with the City of Redding TIA Guidelines, the following guidelines apply if the proposed project causes a significant impact and requires a payment into the Traffic Impact Fee program:

6.1 Impacts in Existing Plus Project Conditions *- It is the project's responsibility to install the project's recommended improvements at the time of development in order to mitigate impacts to a less-than-significant level. The project is 100% responsible for these improvements.*

6.2 Impacts in Cumulative Conditions

> ***A.*** *If the project's fair share of a cumulative impact is 25 percent or more, then the recommended improvements shall be installed at the time of development, subject to a reimbursement agreement. If the recommended improvement is included in the current list of Traffic Impact Fee (TIF) projects, reimbursement will be in the form of either TIF credit or payment from the TIF.*
>
> ***B.*** *If the project's fair share of a cumulative impact is less than 25 percent, then the project will be required to pay its fair share of the cost of the improvements to be constructed later by others, prior to the realization of the impact. If the recommended improvement is included in the current list of TIF projects, then payment of the project's TIF fee will be considered mitigation for the impact.*

Technical Analysis Parameters

This memorandum provides a "preliminary operational level" evaluation of traffic operating conditions. Table 5 below presents the technical analysis parameters that were used in this study.

TABLE 5
INTERSECTION TECHNICAL ANALYSIS PARAMETERS

1	Analysis Period - 15 Minutes
2	Peak Hour Factor (PHF)- from counts for Existing conditions, 0.92 or higher for Year 2040 conditions. PHF Greater than 0.92 due to Existing counts showing higher PHF.
3	% Trucks: weekday peak hour analysis - from counts
4	25 ft. assumed vehicle length for stacking and queues
5	Cycle Length - 80 sec min, 150 sec max (optimize signal timing)
6	Coordinated Cycle Length - obtained from City and Caltrans (optimize signal timing for Year 2040 conditions)
7	Total Lost Time Per Signal Phase - 4 seconds (24 sec max for 8-phase signal)
8	Pedestrian Speed - 3.5 ft/s and 10 mph for bicycles

Source: Figure 4.5 City of Redding TIA Guideline January 2009, modified as appropriate.

Warrant Analysis

A supplemental traffic signal "warrant" analysis was completed for unsignalized intersections determined to be operating at an unacceptable LOS. The term "signal warrant" refers to the list of established criteria used by public agencies to quantitatively justify or ascertain the need for installation of a traffic signal at an unsignalized intersection. This study has employed the signal warrant criteria presented in the latest edition of the *California Manual on Uniform Traffic Control Devices* (CA MUTCD) for all unsignalized study intersection.

The CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. Specifically, this study utilizes the peak hour volume-based Warrant 3 as one representative type of traffic signal warrant analysis. It should be noted that the Peak Hour Volume Warrant was only applied when the intersection was found to be operating at an unacceptable LOS. Therefore, there may be instances when the unsignalized intersection operates at acceptable LOS conditions but still meets the Peak Hour Volume Warrant.

EXECUTIVE SUMMARY TABLE 1
COSTCO WHOLESALE TRAFFIC IMPACT ANALYSIS REPORT
SUMMARY OF INTERSECTION OPERATIONS

SUMMARY OF INTERSECTION OPERATIONS	S. Bonyview Rd/ Cedars Rd & SR 273			S. Bonyview Rd/ Eastside Rd			S. Bonyview Rd/ E. Bonyview Rd			S. Bonyview Rd/ Indianwood Dr			S. Bonyview Rd/ Bechelli Ln			S. Bonyview Rd/ Texaco Dwy			S. Bonyview Rd/ I-5 SB Ramps			S. Bonyview Rd/ I-5 NB Ramps			S. Bonyview Rd/ Churn Creek Rd			Churn Creek Rd/ Alrose Ln			Churn Creek Rd/ Hartmeyer Ln			Churn Creek Rd/ Huntington Dr			Churn Creek Rd/ Victor Ave			Churn Creek Rd/ Rancho Rd		
Intersection Number	1			2			3			4			5			6A			7			8			9			10			11			12			13			14		
Control Type	Signal			Signal			Signal			Signal			Signal			TWSC			Signal			Signal			Signal			TWSC			TWSC			TWSC			TWSC			TWSC		
Target LOS	D			D			D			D			D			D			D			D			D			D			E			D			D			C		
AM PEAK HOUR	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**
Year 2040 with Rancheria	D	40.3	-	D	39.7	-	D	40.6	-	A	7.0	-	D	47.9	Not Ok	C	20.2	-	E	58.6	Not Ok	D	54.1	Not Ok	D	42.4	Not Ok	B	14.3	-	F	55.5	-	E	42.1	-	F	68.9	Not Ok	E	39.9	Not Ok
Year 2040 with Rancheria Plus Project	D	41.5	-	D	42.2	-	D	50.4	-	A	7.1	-	E	65.1	Not Ok	C	23.2	-	F	83.8	Not Ok	E	70.6	Not Ok	D	42.4	Not Ok	B	14.8	-	F	67.2	-	E	48.8	-	F	98.0	Not Ok	F	51.0	Not Ok
Delay Increase Due to Project	1.2			2.5			9.8			0.1			17.2			3.0			25.2			16.5			0.0			0.5			11.7			6.7			29.1			11.1		
Significant Impact?	No			No			No			No			Yes			No			Yes			Yes			No			No			No			No			Yes			Yes		
PM PEAK HOUR																																											
Year 2040 with Rancheria	D	40.0	-	D	52.8	-	D	47.9	-	A	9.5	-	F	104.1	Not Ok	D	32.5	-	E	60.6	Not Ok	D	42.7	Not Ok	D	42.3	Not Ok	C	24.7	-	F	94.7	Not Ok	E	35.2	-	F	OVR	Not Ok	F	62.9	Not Ok
Year 2040 with Rancheria Plus Project	D	40.5	-	D	54.2	-	D	53.4	-	B	10.3	-	F	152.3	Not Ok	E	49.8	-	F	114.9	Not Ok	E	77.8	Not Ok	D	45.5	Not Ok	D	26.4	-	F	125.1	Not Ok	E	39.5	-	F	OVR	Not Ok	F	90.6	Not Ok
Delay Increase Due to Project	0.5			1.4			5.5			0.8			48.2			17.3			54.3			35.1			3.2			1.7			30.4			4.3			Delay>5			27.7		
Significant Impact?	No			No			No			No			Yes			No			Yes			Yes			No			No			Yes			No			Yes			Yes		
SAT PEAK HOUR																																											
Year 2040 with Rancheria	C	30.7	-	C	25.6	-	B	17.5	-	A	7.8	-	E	72.0	Not Ok	C	17.9	-	D	48.2	Not Ok	D	40.4	Not Ok	C	28.9	Not Ok	C	15.1	-	C	21.0	-	E	41.4	Not Ok	E	38.5	Not Ok	B	14.3	-
Year 2040 with Rancheria Plus Project	C	31.5	-	C	26.6	-	B	18.2	-	A	8.0	-	F	128.7	Not Ok	D	25.6	-	E	55.4	Not Ok	E	63.0	Not Ok	C	29.3	Not Ok	C	16.3	-	D	25.0	-	F	60.5	Not Ok	F	67.6	Not Ok	C	16.0	-
Delay Increase Due to Project	0.8			1.0			0.7			0.2			56.7			7.7			7.2			22.6			0.4			1.2			4.0			19.1			29.1			1.7		
Significant Impact?	No			No			No			No			Yes			No			Yes			Yes			No			No			No			No			Yes			No		

SUMMARY OF INTERSECTION OPERATIONS	Rancho Rd/ Alta Mesa Dr			Rancho Rd/ Shasta View Dr			Rancho Rd/ Airport Rd			Bechelli Ln/ Blue Shield Dwy			Bechelli Ln/ Chinook Dr			Bechelli Ln/ Rivercrest Pkwy			Bechelli Ln/ Loma Vista Dr			Bechelli Ln/ Hartnell Ave			Churn Creek Rd/ Public ROW to Chevron			Churn Creek Rd/ Arizona Ln			Churn Creek Rd/ Loma Vista Dr			Churn Creek Rd/Shirley Ln & Enterprise HS Dwy			Churn Creek Rd/ Hartnell Ave		
Intersection Number	15			16			17			18			19			20			21			22			23			24			25			26			27					
Control Type	TWSC			TWSC			Signal			Signal			TWSC			TWSC			TWSC			Signal			Signal			TWSC			Signal			Signal			Signal					
Target LOS	C			C			C			C			C			C			C			C			C			C			C			C			C					
AM PEAK HOUR	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**	**LOS**	**Delay**	**Q95%**			
Year 2040 with Rancheria	C	17.6	-	F	131.3	Not Ok	D	39.4	-	A	7.6	-	B	13.8	-	C	15.9	-	F	112.3	Not Ok	C	34.9	Not Ok	B	16.6	-	B	13.9	-	C	21.3	Not Ok	C	34.2	-	E	57.1	Not Ok			
Year 2040 with Rancheria Plus Project	C	18.7	-	F	164.1	Not Ok	D	42.6	-	B	19.7	-	B	14.2	-	C	16.6	-	F	160.2	Not Ok	C	34.9	Not Ok	B	18.3	-	B	14.1	-	C	21.8	Not Ok	C	34.7	-	E	60.0	Not Ok			
Delay Increase Due to Project	1.1			32.8			3.2			12.1			0.4			0.7			47.9			0.0			1.7			0.2			0.5			0.5			2.9					
Significant Impact?	No			No			No			No			No			No			Yes			No			No			No			No			No			No					
PM PEAK HOUR																																										
Year 2040 with Rancheria	C	15.1	-	F	76.1	Not Ok	C	24.0	-	A	6.4	-	C	16.2	-	C	15.5	-	F	OVR	Not Ok	C	34.9	Not Ok	C	20.5	-	B	13.2	-	B	17.4	Not Ok	B	14.3	-	E	58.9	Not Ok			
Year 2040 with Rancheria Plus Project	C	15.6	-	F	110.0	Not Ok	C	26.9	-	C	25.0	-	C	16.6	-	C	16.4	-	F	OVR	Not Ok	C	35.0	Not Ok	C	24.1	-	B	13.4	-	B	17.7	Not Ok	B	14.5	-	E	60.8	Not Ok			
Delay Increase Due to Project	0.5			33.9			2.9			18.6			0.4			0.9			Delay>5			0.1			3.6			0.2			0.3			0.2			1.9					
Significant Impact?	No			No			No			No			No			No			Yes			No			No			No			No			No			No					
SAT PEAK HOUR																																											
Year 2040 with Rancheria	B	12.7	-	C	22.0	-	B	17.9	-	A	4.7	-	B	12.7	-	B	11.7	-	C	21.6	-	C	24.6	Not Ok	B	19.4	-	B	11.7	-	B	14.7	-	B	11.0	-	C	33.1	Not Ok			
Year 2040 with Rancheria Plus Project	B	13.5	-	D	25.7	-	B	18.6	-	C	22.7	-	B	13.3	-	B	12.4	-	D	26.9	-	C	24.7	Not Ok	C	24.5	-	B	12.0	-	B	15.4	-	B	11.2	-	C	34.1	Not Ok			
Delay Increase Due to Project	0.8			3.7			0.7			18.0			0.6			0.7			5.3			0.1			5.1			0.3			0.7			0.2			1.0					
Significant Impact?	No			No			No			No			No			No			No			No			No			No			No			No			No					

Notes:

LOS - Level of Service

TWSC = Two Way Stop Control

Red = Unacceptable Conditions

OVR = Delays exceeds 300 seconds

Year 2040 with Rancheria Conditions

The *Year 2040 with Rancheria* conditions were simulated by superimposing traffic generated by the build-out of the proposed Redding Rancheria onto *Year 2040 No Project* traffic volumes from the TIAR.

Intersection Operations

Table 6 below presents a summary of the *Year 2040 with Rancheria* study intersection LOS conditions.

TABLE 6
YEAR 2040 WITH RANCHERIA INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	40.3	D	-	40.0	D	-	30.7	C	-
2	S. Bonnyview Rd/ Eastside Rd	Signal	D	39.7	D	-	52.8	D	-	25.6	C	-
3	S. Bonnyview Rd/ E. Bonnyview Rd	Signal	D	40.6	D	-	47.9	D	-	17.5	B	-
4	S. Bonnyview Rd/ Indianwood Dr	Signal	D	7.0	A	-	9.5	A	-	7.8	A	-
5	**S. Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	47.9	D	-	**104.1**	**F**	**-**	**72.0**	**E**	**-**
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	20.2	C	-	32.5	D	-	17.9	C	-
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**58.6**	**E**	**-**	**60.6**	**E**	**-**	48.2	D	**-**
8	S. Bonnyview Rd/ I-5 NB Ramps	Signal	D	54.1	D	-	42.7	D	-	40.4	D	-
9	S. Bonnyview Rd/ Churn Creek Rd	Signal	D	42.4	D	-	42.3	D	-	28.9	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	14.3	B	-	24.7	C	-	15.1	C	-
11	**Churn Creek Rd/ Hartmeyer Ln**	**TWSC**	**E**	**55.5**	**F**	**No**	**94.7**	**F**	**Yes**	21.0	C	**-**
12	**Churn Creek Rd/ Huntington Dr**	**TWSC**	**D**	**42.1**	**E**	**No**	**35.2**	**E**	**No**	**41.4**	**E**	**Yes**
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**68.9**	**F**	**Yes**	**OVR**	**F**	**Yes**	**38.5**	**E**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**39.9**	**E**	**Yes**	**62.9**	**F**	**Yes**	14.3	B	**-**
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	17.6	C	-	15.1	C	-	12.7	B	-
16	**Rancho Rd/ Shasta View Dr**	**TWSC**	**C**	**131.3**	**F**	**No**	**76.1**	**F**	**No**	22.0	C	**-**
17	**Rancho Rd/ Airport Rd**	**Signal**	**C**	**39.4**	**D**	**-**	24.0	C	-	17.9	B	-
18	Bechelli Ln/ Blue Shield Dwy	Signal	C	7.6	A	-	6.4	A	-	4.7	A	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	13.8	B	-	16.2	C	-	12.7	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	15.9	C	-	15.5	C	-	11.7	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**112.3**	**F**	**Yes**	**OVR**	**F**	**Yes**	21.6	C	**-**
22	Bechelli Ln/ Hartnell Ave	Signal	C	34.9	C	-	34.9	C	-	24.6	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	16.6	B	-	20.5	C	-	19.4	B	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	13.9	B	-	13.2	B	-	11.7	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	21.3	C	-	17.4	B	-	14.7	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	34.2	C	-	14.3	B	-	11.0	B	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**57.1**	**E**	**-**	**58.9**	**E**	**-**	33.1	C	**-**

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*
5. OVR = Delay exceeds 300 seconds

As presented in Table 6, all study intersections, except the intersections listed below, are projected to operate at or above the target LOS:

- Intersection 5 – S. Bonnyview Road & Bechelli Lane
- Intersection 7 – S. Bonnyview Road & Interstate 5 SB Ramps
- Intersection 11 – Churn Creek Road & Hartmeyer Lane
- Intersection 12 – Churn Creek Road & Huntington Drive
- Intersection 13 – Churn Creek Road & Victor Avenue
- Intersection 14 – Churn Creek Road & Rancho Road
- Intersection 16 – Rancho Road & Shasta View Drive
- Intersection 17 – Rancho Road & Airport Road
- Intersection 21 – Bechelli Lane & Loma Vista Drive

- Intersection 27 – Churn Creek Road & Hartnell Avenue

Roadway Segment Operations

Table 7 below presents a summary of the *Year 2040 with Rancheria* roadway segment operations.

TABLE 7
YEAR 2040 WITH RANCHERIA ROADWAY OPERATIONS

#	Roadway Segment	Capacity Configuration	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	**S. Bonnyview Rd between SR 273 & Churn Creek Rd**	**Divided Arterial**	**D**	**16**	**E**	**15.4**	**E**	19.1	D
2	**Churn Creek Rd between S. Bonnyview Rd & Rancho Rd**	**Undivided Arterial**	**D**	**706**	**F**	**746**	**F**	496	C
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	451	B	415	B	305	A
4	**Bechelli Ln between S. Bonnyview Rd & Chinook Dr**	**Undivided Arterial**	**C**	**591**	**D**	508	C	363	A
5	**Bechelli Ln between Chinook Dr & 3rd St**	**Divided Arterial**	**C**	549	B	**761**	**E**	395	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	406	A	433	A	288	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	215	A	250	A	200	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

*4. **Bold** = Unacceptable Conditions*

As presented in Table 7, all study roadway segments, except the segments listed below, are projected to operate at or above the target LOS:

- Segment 1 – S. Bonnyview Road between SR 273 and Churn Creek Road
- Segment 2 – Churn Creek Road between S. Bonnyview Road and Rancho Road
- Segment 4 – Bechelli Lane between S. Bonnyview Road and Chinook Drive
- Segment 5 – Bechelli Lane between Chinook Drive and 3rd Street

Intersection Queues

Tables 8A and 8B on the following pages present a summary of the *Year 2040 with Rancheria* queues projected for critical intersections along S. Bonnyview Road, Bechelli Lane, and Churn Creek Road corridors.

TABLE 8A
YEAR 2040 WITH RANCHERIA 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 with Rancheria 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***					
	Eastbound Left	Signal	***330***	***399***	169	200
	Eastbound Thru		460	565	233	
	Eastbound Thru/Right		514	547	301	
	Westbound Left/U-Turn		***215***	***214***	***214***	140
	Westbound Thru		320	320	404	
	Westbound Right		136	83	64	
	Northbound Thru/Left		231	211	666	
	Northbound Right		***94***	***83***	***82***	30
	Southbound Left/U-Turn		221	791	119	
	Southbound Left/Thru		374	833	162	
	Southbound Right		***185***	***255***	97	110
7	***S Bonnyview Rd & I-5 SB Ramps***					
	Eastbound Thru	Signal	***402***	***430***	220	250
	Eastbound Right		179	***373***	109	250
	Westbound Left		236	324	327	
	Westbound Thru		408	506	411	
	Southbound Left/Thru		***553***	***460***	***438***	175
	Southbound Right		506	485	557	
8	***S Bonnyview Rd & I-5 NB Ramps***					
	Eastbound Left	Signal	302	340	276	
	Eastbound Thru		409	423	127	
	Westbound Thru		329	309	294	
	Westbound Right		***273***	***260***	***173***	110
	Northbound Thru/Left		699	602	618	
	Northbound Right		***645***	***690***	***484***	285
9	***S Bonnyview Rd & Churn Creek***					
	Eastbound Left	Signal	***253***	***271***	***222***	130
	Eastbound Thru		303	317	223	
	Eastbound Right		109	***170***	22	115
	Westbound Left		***156***	***126***	***109***	75
	Westbound Thru		311	414	453	
	Westbound Thru/Right		451	495	426	
	Northbound Left/Thru		182	183	160	
	Northbound Right		70	45	28	
	Southbound Thru/Left		564	671	227	
	Southbound Right		744	698	561	

TABLE 8B
YEAR 2040 WITH RANCHERIA 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 with Rancheria 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***					
	Eastbound Left/Thru/Right	Signal	197	347	183	
	Westbound Left/Thru		704	359	461	
	Westbound Thru/Right		697	374	446	
	Northbound Left/Thru/Right		-	93	80	
	Southbound Left		118	104	61	
	Southbound Right		177	152	183	
22	***Bechelli Ln & Hartnell Ave***					
	Eastbound Left	Signal	50	83	39	140
	Eastbound Thru		125	280	128	
	Eastbound Right		51	88	41	140
	Westbound Left		***296***	***414***	***174***	150
	Westbound Thru		188	192	115	
	Westbound Right		51	45	41	155
	Northbound Left		***444***	***266***	***116***	50
	Northbound Thru		188	236	149	
	Southbound Left		***184***	***324***	***152***	50
	Southbound Thru		153	224	118	
25	***Churn Creek Rd & Loma Vista Dr***					
	Eastbound Left/Thru/Right	Signal	238	159	2	
	Westbound Left/Thru/Right		73	59	62	
	Northbound Left		***135***	***70***	59	60
	Northbound Thru		234	214	167	
	Southbound Left		38	41	22	75
	Southbound Thru		194	370	205	
27	***Churn Creek Rd & Hartnell Ave***					
	Eastbound Left	Signal	101	***135***	87	110
	Eastbound Thru		159	285	140	
	Eastbound Right		***78***	***132***	43	75
	Westbound Left		***331***	***330***	***244***	75
	Westbound Thru		238	193	129	
	Westbound Right		99	65	69	205
	Northbound Left		***558***	***252***	***155***	115
	Northbound Thru		687	513	315	
	Southbound Left		***184***	***632***	***437***	110
	Southbound Thru		327	503	290	

Note: ***Bold*** text indicates queues that exceed available storage

Freeway and Ramp Operations

Table 9 below presents a summary of the *Year 2040 with Rancheria* ramp merge, diverge, and freeway mainline operations.

TABLE 9
YEAR 2040 WITH RANCHERIA RAMP AND FREEWAY OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	969	28.0	C	742	23.2	C	250	25.2	C
2	S. Bonnyview Rd to Cypress Ave NB	D	Mainline	3	3,912	23.2	C	3,128	18.5	C	3,671	21.7	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	1,082	26.1	C	1,136	21.4	C	969	23.8	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	1,017	26.0	C	839	19.9	B	688	22.7	C
5	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	3	3,847	22.8	C	2,831	16.7	B	3,395	20.1	C
6	**Knighton Rd to S. Bonnyview Rd NB**	**D**	**Mainline**	**2**	**3,847**	**39.9**	**E**	2,831	25.4	C	3,395	32.3	D
7	**Knighton Rd On Ramp NB**	**D**	**Merge**	**1**	**271**	**37.1**	**E**	328	27.8	C	339	32.8	D
8	**Knighton Rd Off Ramp SB**	**D**	**Diverge**	**1**	228	22.9	C	**384**	**39.6**	**E**	**312**	**36.4**	**E**
9	**S. Bonnyview Rd to Knighton Rd SB**	**D**	**Mainline**	**2**	2,261	20.0	C	**3,947**	**42.0**	**E**	**3,626**	**35.9**	**E**
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	2,261	13.4	B	3,947	23.4	C	3,626	21.4	C
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	648	17.5	B	1,030	26.8	C	610	23.8	C
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	1,108	20.6	C	1,057	26.9	C	853	25.8	C
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	2,721	16.1	B	3,974	23.6	C	3,869	22.9	C
14	Cypress Ave On Ramp SB	D	Merge	1	440	17.9	B	1,019	25.6	C	402	23.7	C

Notes:
Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

As presented in Table 9, all study freeway segments and ramps, except the following, are projected to operate at or above the target LOS:

- Knighton Road to S. Bonnyview Road NB – Mainline (4-lane section)
- Knighton Road On Ramp NB – Merge
- Knighton Road Off Ramp SB – Diverge
- S. Bonnyview Road to Knighton Road SB – Mainline (4-lane section)

Year 2040 with Rancheria Plus Project Conditions

The *Year 2040 with Rancheria Plus Project* conditions were simulated by superimposing traffic generated by the build-out of the proposed project onto *Year 2040 with Rancheria* traffic volumes.

Intersection Operations

Table 10 on the following page presents a summary of the *Year 2040 with Rancheria Plus Project* study intersection LOS conditions.

TABLE 10
YEAR 2040 WITH RANCHERIA PLUS PROJECT INTERSECTION OPERATIONS

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	S. Bonnyview Rd/ Cedars Rd & SR 273	Signal	D	41.5	D	-	40.5	D	-	31.5	C	-
2	S. Bonnyview Rd/ Eastside Rd	Signal	D	42.2	D	-	54.2	D	-	26.6	C	-
3	S. Bonnyview Rd/ E. Bonnyview Rd	Signal	D	50.4	D	-	53.4	D	-	18.2	B	-
4	S. Bonnyview Rd/ Indianwood Dr	Signal	D	7.1	A	-	10.3	B	-	8.0	A	-
5	**S. Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**65.1**	**E**	**-**	**152.3**	**F**	**-**	**128.7**	**F**	**-**
6A	**S. Bonnyview Rd/ Texaco Dwy**	**TWSC**	**D**	23.2	C	-	**49.8**	**E**	**No**	25.6	D	-
6B	**S. Bonnyview Rd/ S. Bonnyview Dwy**	**TWSC**	**D**	**52.6**	**F**	**No**	**51.4**	**F**	**No**	**65.6**	**F**	**No**
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**83.8**	**F**	**-**	**114.9**	**F**	**-**	**55.4**	**E**	**-**
8	**S. Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**70.6**	**E**	**-**	**77.8**	**E**	**-**	**63.0**	**E**	**-**
9	S. Bonnyview Rd/ Churn Creek Rd	Signal	D	42.4	D	-	45.5	D	-	29.3	C	-
10	Churn Creek Rd/ Alrose Ln	TWSC	D	14.8	B	-	26.4	D	-	16.3	C	-
11	**Churn Creek Rd/ Hartmeyer Ln**	**TWSC**	**E**	**67.2**	**F**	**No**	**125.1**	**F**	**Yes**	25.0	D	-
12	**Churn Creek Rd/ Huntington Dr**	**TWSC**	**D**	**48.8**	**E**	**No**	**39.5**	**E**	**No**	**60.5**	**F**	**Yes**
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**98.0**	**F**	**Yes**	**OVR**	**F**	**Yes**	**67.6**	**F**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**51.0**	**F**	**Yes**	**90.6**	**F**	**Yes**	16.0	C	-
15	Rancho Rd/ Alta Mesa Dr	TWSC	C	18.7	C	-	15.6	C	-	13.5	B	-
16	**Rancho Rd/ Shasta View Dr**	**TWSC**	**C**	**164.1**	**F**	**No**	**110.0**	**F**	**No**	**25.7**	**D**	**No**
17	**Rancho Rd/ Airport Rd**	**Signal**	**C**	**42.6**	**D**	**-**	26.9	C	-	18.6	B	-
18	Bechelli Ln/ Blue Shield Dwy	Signal	C	19.7	B	-	25.0	C	-	22.7	C	-
19	Bechelli Ln/ Chinook Dr	TWSC	C	14.2	B	-	16.6	C	-	13.3	B	-
20	Bechelli Ln/ Rivercrest Pkwy	TWSC	C	16.6	C	-	16.4	C	-	12.4	B	-
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**160.2**	**F**	**Yes**	**OVR**	**F**	**Yes**	**26.9**	**D**	**No**
22	Bechelli Ln/ Hartnell Ave	Signal	C	34.9	C	-	35.0	C	-	24.7	C	-
23	Churn Creek Rd/ Public ROW to Chevron	Signal	C	18.3	B	-	24.1	C	-	24.5	C	-
24	Churn Creek Rd/ Arizona Ln	TWSC	C	14.1	B	-	13.4	B	-	12.0	B	-
25	Churn Creek Rd/ Loma Vista Dr	Signal	C	21.8	C	-	17.7	B	-	15.4	B	-
26	Churn Creek Rd/Shirley Ln & Enterprise HS Dwy	Signal	C	34.7	C	-	14.5	B	-	11.2	B	-
27	**Churn Creek Rd/ Hartnell Ave**	**Signal**	**C**	**60.0**	**E**	**-**	**60.8**	**E**	**-**	34.1	C	**-**
28	**Bechelli Ln/Northern Dwy**	**TWSC**	**C**	21.0	C	**-**	**39.5**	**E**	**No**	24.7	C	**-**
29	**Behcelli Ln/Southern Dwy**	**TWSC**	**C**	**36.9**	**E**	**-**	**52.8**	**F**	**-**	**32.3**	**D**	**-**

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3
*4. **Bold** = Unacceptable Conditions*
5. OVR = Delay exceeds 300 seconds

As presented in Table 10, all study intersections, except the intersections listed below, are projected to operate at or above the target LOS:

- Intersection 5 – S. Bonnyview Road & Bechelli Lane
- Intersection 6A – S. Bonnyview Road & Texaco Driveway
- Intersection 6B – S. Bonnyview Road & S. Bonnyview Driveway
- Intersection 7 – S. Bonnyview Road & Interstate 5 SB Ramps
- Intersection 8 – S. Bonnyview Road & Interstate 5 NB Ramps
- Intersection 11 – Churn Creek Road & Hartmeyer Lane
- Intersection 12 – Churn Creek Road & Huntington Drive
- Intersection 13 – Churn Creek Road & Victor Avenue
- Intersection 14 – Churn Creek Road & Rancho Road
- Intersection 16 – Rancho Road & Shasta View Drive
- Intersection 17 – Rancho Road & Airport Road
- Intersection 21 – Bechelli Lane & Loma Vista Drive
- Intersection 27 – Churn Creek Road & Hartnell Avenue
- Intersection 28 – Bechelli Lane & Northern Driveway
- Intersection 29 – Bechelli Lane & Southern Driveway

Roadway Segment Operations

Table 11 below presents a summary of the *Year 2040 with Rancheria Plus Project* roadway segment operations.

TABLE 11
YEAR 2040 WITH RANCHERIA PLUS PROJECT ROADWAY OPERATIONS

#	Roadway Segment	Capacity Configuration	Target LOS	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
				ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS	ATS [2]/ Volume [3]	LOS
1	**S. Bonnyview Rd between SR 273 & Churn Creek Rd**	**Divided Arterial**	**D**	**14.8**	**E**	**12.5**	**F**	17.2	D
2	**Churn Creek Rd between S. Bonnyview Rd & Rancho Rd**	**Undivided Arterial**	**D**	**738**	**F**	**781**	**F**	548	D
3	Rancho Rd between Churn Creek Rd & Airport Rd	Undivided Arterial	C	472	C	434	B	337	A
4	**Bechelli Ln between S. Bonnyview Rd & Chinook Dr**	**Undivided Arterial**	**C**	492	C	**689**	**F**	487	C
5	**Bechelli Ln between Chinook Dr & 3rd St**	**Divided Arterial**	**C**	566	C	**781**	**E**	433	A
6	Churn Creek Rd between S. Bonnyview Rd & Hartnell Ave	Divided Arterial	C	415	A	442	A	304	A
7	Churn Creek Rd between Rancho Rd & Knighton Rd	Collector	C	218	A	253	A	205	A

Notes:

1. Roadway Type as designated by Table 4.5 E of the City of Redding TIA Guidelines

2. ATS= Arterial Travel Speed. ATS is indicated only for the S. Bonnyview Road corridor between SR 273 & Churn Creek Rd.

3. Volume indicates Maximum Peak Hour Volume Per Lane.

*4. **Bold** = Unacceptable Conditions*

As presented in Table 11, all study roadway segments, except the segments listed below, are projected to operate at or above the target LOS:

- Segment 1 – S. Bonnyview Road between SR 273 and Churn Creek Road
- Segment 2 – Churn Creek Road between S. Bonnyview Road and Rancho Road
- Segment 4 – Bechelli Lane between S. Bonnyview Road and Chinook Drive
- Segment 5 – Bechelli Lane between Chinook Drive and 3rd Street

Intersection Queues

Tables 12A and 12B on the following pages present a summary of the *Year 2040 with Rancheria Plus Project* queues projected for critical intersections along S. Bonnyview Road, Bechelli Lane, and Churn Creek Road corridors.

TABLE 12A
YEAR 2040 WITH RANCHERIA PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 with Rancheria 95th Percentile Queue (ft)			Yr 2040 with Rancheria Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
5	***S Bonnyview Rd & Bechelli Ln***								
	Eastbound Left	Signal	***330***	***399***	169	***353***	***399***	***307***	200
	Eastbound Thru		460	565	233	569	612	880	
	Eastbound Thru/Right		514	547	301	570	547	914	
	Westbound Left/U-Turn		***215***	***214***	***214***	***215***	***221***	***218***	140
	Westbound Thru		320	320	404	329	322	760	
	Westbound Right		136	83	64	136	83	65	
	Northbound Thru/Left		231	211	666	239	211	666	
	Northbound Right		***94***	***83***	***82***	***94***	***114***	***84***	30
	Southbound Left/U-Turn		221	791	119	544	1318	393	
	Southbound Left/Thru		374	833	162	656	1023	376	
	Southbound Right		***185***	***255***	97	***260***	***270***	***289***	110
7	***S Bonnyview Rd & I-5 SB Ramps***								
	Eastbound Thru	Signal	***402***	***430***	220	***423***	***430***	***325***	250
	Eastbound Right		179	***373***	109	196	***373***	199	250
	Westbound Left		236	324	327	246	324	327	
	Westbound Thru		408	506	411	527	506	433	
	Southbound Left/Thru		***553***	***460***	***438***	***575***	***569***	***438***	175
	Southbound Right		506	485	557	506	485	557	
8	***S Bonnyview Rd & I-5 NB Ramps***								
	Eastbound Left	Signal	302	340	276	326	340	356	
	Eastbound Thru		409	423	127	409	559	441	
	Westbound Thru		329	309	294	329	318	310	
	Westbound Right		***273***	260	***173***	***288***	***260***	***173***	110
	Northbound Thru/Left		699	602	618	699	602	860	
	Northbound Right		***645***	***690***	***484***	***660***	***690***	***681***	285
9	***S Bonnyview Rd & Churn Creek Rd***								
	Eastbound Left	Signal	***253***	***271***	***222***	***253***	***271***	***229***	130
	Eastbound Thru		303	317	223	303	332	330	
	Eastbound Right		109	***170***	22	109	***170***	22	115
	Westbound Left		***156***	***126***	***109***	***156***	***126***	***109***	75
	Westbound Thru		311	414	453	311	414	477	
	Westbound Thru/Right		451	495	426	451	495	499	
	Northbound Left/Thru		182	183	160	182	183	186	
	Northbound Right		70	45	28	76	45	28	
	Southbound Thru/Left		564	671	227	564	671	792	
	Southbound Right		744	698	561	764	698	720	

TABLE 12B
YEAR 2040 WITH RANCHERIA PLUS PROJECT 95TH PERCENTILE QUEUE LENGTHS

Int. #	Intersection/Approach	Control Type	Yr 2040 with Rancheria 95th Percentile Queue (ft)			Yr 2040 with Rancheria Plus Project 95th Percentile Queue (ft)			Available Storage
			AM Peak Hour	PM Peak Hour	Sat Mid-Day	AM Peak Hour	PM Peak Hour	Sat Mid-Day	
10	***Churn Creek Rd & Alrose Ln***								
	Eastbound Left/Thru/Right	Signal	197	347	183	197	347	202	
	Westbound Left/Thru		704	359	461	704	700	863	
	Westbound Thru/Right		697	374	446	699	659	890	
	Northbound Left/Thru/Right		-	93	80	-	131	129	
	Southbound Left		118	104	61	118	127	104	
	Southbound Right		177	152	183	177	171	188	
22	***Bechelli Ln & Hartnell Ave***								
	Eastbound Left	Signal	50	83	39	50	83	39	140
	Eastbound Thru		125	280	128	125	280	128	
	Eastbound Right		51	88	41	52	88	50	140
	Westbound Left		***296***	***414***	***174***	***296***	***414***	***174***	150
	Westbound Thru		188	192	115	188	192	115	
	Westbound Right		51	45	41	51	45	41	155
	Northbound Left		***444***	***266***	***116***	***454***	***287***	***126***	50
	Northbound Thru		188	236	149	188	236	149	
	Southbound Left		***184***	***324***	***152***	***184***	***333***	***152***	50
	Southbound Thru		153	224	118	153	224	120	
25	***Churn Creek Rd & Loma Vista Dr***								
	Eastbound Left/Thru/Right	Signal	238	159	2	245	166	62	
	Westbound Left/Thru/Right		73	59	62	77	62	68	
	Northbound Left		***135***	***70***	59	***136***	***71***	60	60
	Northbound Thru		234	214	167	242	223	181	
	Southbound Left		38	41	22	38	41	23	75
	Southbound Thru		194	370	205	206	386	222	
27	***Churn Creek Rd & Hartnell Ave***								
	Eastbound Left	Signal	101	***135***	87	101	***135***	87	110
	Eastbound Thru		159	285	140	159	285	141	
	Eastbound Right		***78***	***132***	43	***78***	***132***	43	75
	Westbound Left		***331***	***330***	***244***	***362***	***360***	***276***	75
	Westbound Thru		238	193	129	238	193	129	
	Westbound Right		99	65	69	99	65	69	205
	Northbound Left		***558***	***252***	***155***	***558***	***252***	***157***	115
	Northbound Thru		687	513	315	704	532	332	
	Southbound Left		***184***	***632***	***437***	***184***	***632***	***437***	110
	Southbound Thru		327	503	290	333	513	290	

Note: ***Bold*** text indicates queues that exceed available storage

Freeway and Ramp Operations

Table 13 below presents a summary of the *Year 2040 with Rancheria Plus Project* ramp merge, diverge, and freeway mainline operations.

TABLE 13
YEAR 2040 WITH RANCHERIA PLUS PROJECT RAMP AND FREEWAY OPERATIONS

#	Interchange Location	Target LOS	Segment Type	No. of Lanes	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
					Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
	Interstate 5 (I-5)												
1	Cypress Ave Off Ramp NB	D	Diverge	1	979	28.4	D	755	23.8	C	270	26.2	C
2	S. Bonnyview Rd to Cypress Ave NB	D	Mainline	3	3,996	23.7	C	3,232	19.1	C	3,836	22.7	C
3	S. Bonnyview Rd On Ramp NB	D	Merge	1	1,168	26.8	C	1,311	22.4	C	1,198	25.2	C
4	S. Bonnyview Rd Off Ramp NB	D	Diverge	1	1,088	26.6	C	970	20.6	C	864	23.7	C
5	Knighton Rd to S. Bonnyview Rd NB	D	Mainline	3	3,916	23.2	C	2,891	17.1	B	3,502	20.7	C
6	**Knighton Rd to S. Bonnyview Rd NB**	**D**	**Mainline**	**2**	**3,916**	**41.3**	**E**	2,891	26.0	D	3,502	33.8	D
7	**Knighton Rd On Ramp NB**	**D**	**Merge**	**1**	**277**	**37.7**	**E**	334	28.4	D	349	33.8	D
8	**Knighton Rd Off Ramp SB**	**D**	**Diverge**	**1**	233	23.5	C	**390**	**40.4**	**E**	**322**	**37.6**	**E**
9	**S. Bonnyview Rd to Knighton Rd SB**	**D**	**Mainline**	**2**	2,317	20.5	C	**4,024**	**43.7**	**E**	**3,740**	**37.9**	**E**
10	S. Bonnyview Rd to Knighton Rd SB	D	Mainline	3	2,317	13.7	B	4,024	23.9	C	3,740	22.1	C
11	S. Bonnyview Rd On Ramp SB	D	Diverge	1	705	18.0	B	1,195	27.7	C	797	24.9	C
12	S. Bonnyview Rd Off Ramp SB	D	Mainline	1	1,212	21.5	C	1,244	27.8	C	1,091	27.2	C
13	Cypress Ave to S. Bonnyview Rd SB	D	Mainline	3	2,824	16.7	B	4,073	24.2	C	4,043	24.0	C
14	Cypress Ave On Ramp SB	D	Merge	1	449	18.4	C	1,028	26.1	C	417	24.6	C

Notes:
Capacity of Upstream/Downstrean Freeway segment is 7,200 pc/h or 2,400 pc/hr/ln
Bold *text indicates unacceptable roadway operations.*

As presented in Table 13, all study freeway segments and ramps, except the following, are projected to operate at or above the target LOS:

- Knighton Road to S. Bonnyview Road NB – Mainline (4-lane section)
- Knighton Road On Ramp NB – Merge
- Knighton Road Off Ramp SB – Diverge
- S. Bonnyview Road to Knighton Road SB – Mainline (4-lane section)

Project Impacts and Mitigation Measures

This section presents recommended project-related mitigation measures at the study intersections. These mitigation measures were developed based on the findings from the analyses presented in the prior sections of this report.

Impact Significance Criteria

In accordance with the January 2009 City of Redding TIA Guidelines, the following thresholds of significance were used to determine if the proposed project causes a significant impact and requires mitigation:

Signalized Intersections

- The project causes an acceptable LOS to decline to an unacceptable LOS, or
- The project increases the overall average delay by more than 5 seconds per vehicle at an intersection having an unacceptable LOS without project traffic

Two-Way Stop Intersections

- The project causes the following to occur for the worst-case movement:
  - The LOS declines to an unacceptable LOS, and

  - The volume to capacity ratio exceeds 0.75, and
  - The 95th percentile queue exceeds 75 feet (three vehicles), or
- The project causes the worst-case movement's acceptable LOS to decline to an unacceptable LOS and the peak hour volume signal warrant is met, or
- The project increases the average delay for the worst-case movement by more than five seconds per vehicle at an intersection that has an unacceptable LOS without the project and the intersection also meets the peak hour volume signal warrant.

Roadways

City of Redding TIA Guidelines do not have specified significance thresholds for Roadway Segments. Therefore, consistent with past reports and industry standards, the following thresholds were established. The project would have a significant impact if it would:

- Result in a roadway that would operate at an acceptable LOS in the No Project condition to deteriorate to an unacceptable LOS in the Plus Project condition; or
- Increase the volume to capacity (V/C) ratio by more than 5% at a roadway that would operate at an unacceptable LOS in the No Project condition; or
- Decrease the average arterial speed by more than 5% at a roadway that would operate at an unacceptable LOS in the No Project condition.

Freeway Mainline/Ramp Merge-Diverge/Weave

Caltrans TIA Guidelines do not have specified significance thresholds for Roadway Segments. Therefore, consistent with past reports and industry standards, the following thresholds were established. The project would have a significant impact if it would:

- Result in a facility that would operate at an acceptable LOS in the No Project condition to deteriorate to an unacceptable LOS in the Plus Project condition; or
- Increase the density by more than 5% at a facility that would operate at an unacceptable LOS in the No Project condition.

Year 2040 with Rancheria Plus Project Impacts

Table 14A on the following page presents the intersections projected to operate at unacceptable levels of service under *Year 2040 with Rancheria Plus Project c*onditions when compared to the *Year 2040 with Rancheria* conditions and determines whether a significant impact was identified.

TABLE 14A
YEAR 2040 WITH RANCHERIA PLUS PROJECT IMPACTS AT INTERSECTIONS

AM Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria Delay (D1)	Year 2040 with Rancheria Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S. Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**D**	**E**	**47.9**	**65.1**	**17.2**	**-**	**-**	**-**	**Yes**
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**E**	**F**	**58.6**	**83.8**	**25.2**	**-**	**-**	**-**	**Yes**
8	**S. Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**D**	**E**	**54.1**	**70.6**	**16.5**	**-**	**-**	**-**	**Yes**
11	Churn Creek Rd/ Hartmeyer Ln	TWSC	E	F	F	55.5	67.2	11.7	No	0.44	2	No
12	Churn Creek Rd/ Huntington Dr	TWSC	D	E	E	42.1	48.8	6.7	No	0.29	1	No
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**F**	**F**	**68.9**	**98.0**	**29.1**	**Yes**	**1.04**	**12**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**E**	**F**	**39.9**	**51.0**	**11.1**	**Yes**	**0.96**	**13**	**Yes**
16	Rancho Rd/ Shasta View Dr	TWSC	C	F	F	131.3	164.1	32.8	No	1.21	15	No
17	Rancho Rd/ Airport Rd	Signal	C	D	D	39.4	42.6	3.2	-	-	-	No
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**F**	**F**	**112.3**	**160.2**	**47.9**	**Yes**	**1.17**	**13**	**Yes**
27	Churn Creek Rd/ Hartnell Ave	Signal	C	E	E	57.1	60.0	2.9	-	-	-	No

PM Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria Delay (D1)	Year 2040 with Rancheria Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S. Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**F**	**F**	**104.1**	**152.3**	**48.2**	**-**	**-**	**-**	**Yes**
6A	S. Bonnyview Rd/ Texaco Dwy	TWSC	D	D	E	32.5	49.8	17.3	No	0.49	2	No
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**E**	**F**	**60.6**	**114.9**	**54.3**	**-**	**-**	**-**	**Yes**
8	**S. Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**D**	**E**	**42.7**	**77.8**	**35.1**	**-**	**-**	**-**	**Yes**
11	**Churn Creek Rd/ Hartmeyer Ln**	**TWSC**	**E**	**F**	**F**	**94.7**	**125.1**	**30.4**	**Yes**	**0.91**	**6**	**Yes**
12	Churn Creek Rd/ Huntington Dr	TWSC	D	E	E	35.2	39.5	4.3	No	0.17	1	No
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**F**	**F**	**OVR**	**OVR**	**>5**	**Yes**	**1.98**	**27**	**Yes**
14	**Churn Creek Rd/ Rancho Rd**	**TWSC**	**C**	**F**	**F**	**62.9**	**90.6**	**27.7**	**Yes**	**1.06**	**15**	**Yes**
16	Rancho Rd/ Shasta View Dr	TWSC	C	F	F	76.1	110.0	33.9	No	1.01	9	No
21	**Bechelli Ln/ Loma Vista Dr**	**TWSC**	**C**	**F**	**F**	**OVR**	**OVR**	**>5**	**Yes**	**2.15**	**17**	**Yes**
27	Churn Creek Rd/ Hartnell Ave	Signal	C	E	E	58.9	60.8	1.9	-	-	-	No

Saturday Peak Hour												
#	Intersection	Control Type[1]	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria Delay (D1)	Year 2040 with Rancheria Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	V/C Ratio	95% Queue (veh)	Significant Impact?
5	**S. Bonnyview Rd/ Bechelli Ln**	**Signal**	**D**	**E**	**F**	**72.0**	**128.7**	**56.7**	**-**	**-**	**-**	**Yes**
7	**S. Bonnyview Rd/ I-5 SB Ramps**	**Signal**	**D**	**D**	**E**	**48.2**	**55.4**	**7.2**	**-**	**-**	**-**	**Yes**
8	**S. Bonnyview Rd/ I-5 NB Ramps**	**Signal**	**D**	**D**	**E**	**40.4**	**63.0**	**22.6**	**-**	**-**	**-**	**Yes**
12	**Churn Creek Rd/ Huntington Dr**	**TWSC**	**D**	**E**	**F**	**41.4**	**60.5**	**19.1**	**Yes**	**0.64**	**4**	**Yes**
13	**Churn Creek Rd/ Victor Ave**	**TWSC**	**D**	**E**	**F**	**38.5**	**67.6**	**29.1**	**Yes**	**0.93**	**10**	**Yes**
16	Rancho Rd/ Shasta View Dr	TWSC	C	C	D	22	25.7	3.7	No	0.47	3	No
21	Bechelli Ln/ Loma Vista Dr	TWSC	C	C	D	21.6	26.9	5.3	No	0.46	3	No

Notes:

1. TWSC = Two Way Stop Control, OVR = >300 Seconds Delay

2. LOS = Delay based on worst minor street movement for TWSC intersections, average delay for AWSC and Signal intersections.

3. V/C and 95% Queue not reported if not required to determine significance

*4. **Bold** = Unacceptable Conditions and Significant Impact*

5. OVR = Delay exceeds 300 seconds

Table 14B on the following page presents the roadway segments projected to operate at unacceptable levels of service under *Year 2040 with Rancheria Plus Project* conditions and determines whether a significant impact was identified.

TABLE 14B
YEAR 2040 WITH RANCHERIA PLUS PROJECT SIGNIFICANT IMPACTS AT ROADWAY SEGMENTS

AM Peak Hour									
#	Roadway Segment	Control Type[1]	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria V/C Ratio (V/C_1) or Ave. Arterial Speed (AAS_1)	Year 2040 with Rancheria Plus Project V/C Ratio (V/C_2) or Ave. Arterial Speed (AAS_2)	Percentage Increase in V/C Ratio (V/C_1-V/C_2) or Decrease in Ave. Arterial Speed (AAS_1-AAS_2)	Significant Impact?
1	**S. Bonnyview Rd between SR 273 & Churn Creek Rd**	**Divided Arterial**	**D**	**E**	**E**	**16.0**	**14.8**	**7.5%**	**Yes**
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	F	F	1.157	1.211	4.6%	No

PM Peak Hour									
#	Roadway Segment	Control Type[1]	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria V/C Ratio (V/C_1) or Ave. Arterial Speed (AAS_1)	Year 2040 with Rancheria Plus Project V/C Ratio (V/C_2) or Ave. Arterial Speed (AAS_2)	Percentage Increase in V/C Ratio (V/C_1-V/C_2) or Decrease in Ave. Arterial Speed (AAS_1-AAS_2)	Significant Impact?
1	**S. Bonnyview Rd between SR 273 & Churn Creek Rd**	**Divided Arterial**	**D**	**E**	**F**	**15.4**	**12.5**	**18.8%**	**Yes**
2	Churn Creek Rd between S. Bonnyview Rd & Rancho Rd	Undivided Arterial	D	F	F	1.22	1.28	4.8%	No
4	**Bechelli Ln between S. Bonnyview Rd & Chinook Dr**	**Undivided Arterial**	**C**	**C**	**F**	**0.94**	**1.28**	**35.8%**	**Yes**
5	Bechelli Ln between Chinook Dr & 3rd St	Divided Arterial	C	E	E	1.17	1.20	2.6%	No

Notes:

1. ***Bold*** *= Unacceptable Conditions and Significant Impact*

Table 14C below presents the freeway mainline and ramp segments projected to operate at unacceptable levels of service under *Year 2040 with Rancheria Plus Project* conditions and determines whether a significant impact was identified.

TABLE 14C
YEAR 2040 WITH RANCHERIA PLUS PROJECT SIGNIFICANT IMPACTS AT FREEWAY MAINLINE & RAMPS

AM Peak Hour									
#	Freeway Segment	Segment Type	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria Density (pc/mi/ln) (D1)	Year 2040 with Rancheria Plus Project Density (pc/mi/ln) (D2)	Percentage Increase in Density (D2-D1)	Significant Impact?
6	Knighton Rd to S. Bonnyview Rd NB	Mainline	D	E	E	39.9	41.3	4%	No
7	Knighton Rd On Ramp NB	Merge	D	E	E	37.1	37.7	2%	No

PM Peak Hour									
#	Freeway Segment	Segment Type	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria Density (pc/mi/ln) (D1)	Year 2040 with Rancheria Plus Project Density (pc/mi/ln) (D2)	Percentage Increase in Density (D2-D1)	Significant Impact?
8	Knighton Rd Off Ramp SB	Diverge	D	E	E	39.6	40.4	2%	No
9	S. Bonnyview Rd to Knighton Rd SB	Mainline	D	E	E	42.0	43.7	4%	No

Saturday Peak Hour									
#	Freeway Segment	Segment Type	Target LOS	Year 2040 with Rancheria LOS[2]	Year 2040 with Rancheria Plus Project LOS[2]	Year 2040 with Rancheria Density (pc/mi/ln) (D1)	Year 2040 with Rancheria Plus Project Density (pc/mi/ln) (D2)	Percentage Increase in Density (D2-D1)	Significant Impact?
8	Knighton Rd Off Ramp SB	Diverge	D	E	E	36.4	37.6	3%	No
9	**S. Bonnyview Rd to Knighton Rd SB**	**Mainline**	**D**	**E**	**E**	**35.9**	**37.9**	**6%**	**Yes**

Notes:

1. ***Bold*** *= Unacceptable Conditions and Significant Impact*

Year 2040 with Rancheria Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections where a project significant impact was identified for the *Year 2040 with Rancheria Plus Project* conditions. The post-mitigation LOS tables are included in Appendix A.

Intersection 5 - S. Bonnyview Road & Bechelli Lane

This signalized intersection is projected to operate at LOS E in the weekday AM peak hour scenario and at LOS F in the weekday PM peak hour scenario. The proposed project would create a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable in the AM peak hour and by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably in the PM peak hour. The following improvements are proposed to mitigate the project impact to less than significant:

- Widen the southbound approach to provide:
  - Two left-turn pockets of length 325 feet
  - One shared thru/left-turn of length 325 feet
  - One right-turn lane of length 325 feet
- Widen the eastbound approach to provide:
  - Two left-turn lanes of length 400 feet
  - Three thru lanes of length 400 feet
  - One right-turn pocket of length 350 feet
- Widen the westbound approach to provide:
  - Two left-turn pockets of length 200 feet

OR

- Construct a multi-lane roundabout

After the mitigations stated above, the mitigated LOS is projected to be LOS D for the signal alternative and LOS C for the multi-lane roundabout alternative.

Intersection 7 - S. Bonnyview Road & I-5 Southbound Ramps

This signalized intersection is projected to operate at LOS F in the weekday AM and PM peak hours. The proposed project would create a significant impact at this intersection by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably in the AM and PM peak hours. The following improvements are proposed to mitigate the project impact to less than significant:

- Widen the eastbound approach to provide:
  - Two thru lanes that transition into two trap left-turn lanes at the subsequent intersection of S. Bonnyview Road & I-5 NB Ramps
- Widen the westbound approach to provide:
  - Two left-turn lanes
- Widen the southbound approach to provide:
  - A shared thru/left-turn pocket of length 400 feet
  - Two right-turn lanes of length 400 feet

OR

- Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange

After the mitigations stated above, the mitigated LOS is projected to be LOS D for the signal alternative and LOS C for the diverging diamond interchange alternative.

Intersection 8 - S. Bonnyview Road & I-5 Northbound Ramps

This signalized intersection is projected to operate at LOS E in the weekday AM and PM peak hours. The proposed project would create a significant impact at this intersection by causing the LOS to deteriorate from acceptable to unacceptable in the AM and PM peak hours. The following improvements are proposed to mitigate the project impact to less than significant:

- Widen the eastbound approach to provide:
  - An additional eastbound left-turn lane
- Widen the northbound approach to provide:
  - One left-turn lane of length 500 feet
  - One shared thru/left-turn lane of length 500 feet
  - One right-turn lane of length 500 feet

OR

- Construct the intersections of S. Bonnyview Road/I-5 SB Ramps and S. Bonnyview Road/I-5 NB Ramps into a diverging diamond interchange

After the mitigations stated above, the mitigated LOS is projected to be LOS D for the signal alternative and LOS C for the diverging diamond interchange alternative.

Intersection 11 - Churn Creek Road & Hartmeyer Lane

This unsignalized intersection is projected to operate at LOS F in the weekday PM peak hour. The proposed project would create a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably, and meets the peak hour signal warrant. The following improvements are proposed to mitigate the project impact to less than significant:

- Reconstruct the intersection to achieve the following:
  - Eliminate westbound left-turn movements
  - Provide a receiving lane on westbound Churn Creek Road for northbound left-turns
  - Provide a northbound right-turn lane
  - Widen the adjacent bridge to accommodate intersection improvements

After the mitigations stated above, the mitigated LOS is projected to be LOS D.

Intersection 12 - Churn Creek Road & Huntington Drive

This unsignalized intersection is projected to operate at LOS F during the Saturday mid-day peak hour of the "plus project" condition. The proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating at an unacceptable LOS and meets the peak hour signal warrant. As Churn Creek Road does not operate exclusively within an urban setting in the vicinity of Huntington Drive, the peak hour signal warrant was conducted for rural conditions. The following improvements are proposed to mitigate the project impact to less than significant:

- Reconstruct the intersection to achieve the following:
  - A two-way left-turn lane (TWLTL) along eastbound-westbound Churn Creek Road

After the mitigations stated above, the mitigated LOS is projected to be LOS C.

Intersection 13 - Churn Creek Road & Victor Avenue

This unsignalized intersection is projected to operate at LOS F in the weekday AM and PM peak hours. The proposed project would create a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating at an unacceptable LOS and meets the peak hour signal warrant. The following improvements are proposed to mitigate the project impact to less than significant:

- Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single-lane roundabout

After the mitigations stated above, the mitigated LOS is projected to be LOS B.

Intersection 14 - Churn Creek Road & Rancho Road

This unsignalized intersection is projected to operate at LOS F in the weekday AM and PM peak hours. The proposed project would create a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably and meets the peak hour signal warrant. The following improvements are proposed to mitigate the project to less than significant:

- Construct the intersections of Churn Creek Road/Victor Avenue and Churn Creek Road/Rancho Road into a 4-leg, single-lane roundabout

After the mitigations stated above, the mitigated LOS is projected to be LOS B.

Intersection 21 - Bechelli Lane & Loma Vista Drive

This unsignalized intersection is projected to operate at LOS F in the weekday AM and PM peak hours. The proposed project would create a significant impact by causing the delay to increase by more than 5 seconds per vehicle at an intersection operating unacceptably and meets the peak hour signal warrant. The following improvements are proposed to mitigate the project to less than significant:

- Construct a traffic signal with split phasing for the eastbound and westbound approaches and protected left-turn movements on northbound and southbound approaches

OR

- Construct a 4-leg, single-lane roundabout

After the mitigations stated above, the mitigated LOS is projected to be LOS C for the signal alternative and LOS B for the single-lane roundabout alternative.

Roadway Segments

The following improvements are proposed to provide acceptable operations at roadways where a project significant impact was identified for the *Year 2040 with Rancheria Plus Project* conditions.

Segment 1 - S. Bonnyview Road (from SR 273 to Churn Creek Road)

This roadway segment is projected to operate at LOS E and LOS F in the weekday AM and PM peak hours. The proposed project would create a significant impact by causing the average arterial speed to decrease by more than 5% at a roadway operating unacceptably. The following improvement is proposed to mitigate the project impact to less than significant:

- Construct improvements identified for *Year 2040 with Rancheria Plus Project* at intersections of 5, 7, and 8 to provide acceptable roadway operations

Segment 4 – Bechelli Lane (from S. Bonnyview Road to Chinook Drive)

This roadway segment is projected to operate at LOS F in the weekday PM peak hour. The proposed project would create a significant impact by causing the LOS to deteriorate from acceptable to unacceptable. The following intersection improvements are proposed to mitigate the project impact to less than significant:

- Construct a two-way left-turn lane (TWLTL) on Bechelli Lane from Chinook Drive to Northern Driveway

Freeway Mainline and Ramp Segments

The following improvements are proposed to provide acceptable operations on freeway mainline segments and ramps where a project significant impact was identified for the *Year 2040 with Rancheria Plus Project* conditions.

Segment 9 - I-5 SB from S. Bonnyview Road to Knighton Road

This freeway mainline segment is projected to operate at LOS E during the Saturday mid-day peak hour. The project would create a significant impact by causing the lane density to increase by 5% at a segment operating unacceptably. The following improvement can mitigate the project impact to less than significant:

- Widen the mainline segment from two lanes to three lanes in each direction

Fair Share of Improvement Cost Calculations

Fair-share calculations have been identified for all intersections, which are projected to operate at an unacceptable LOS under *Year 2040 with Rancheria* conditions, and experience an increase in delay with the addition of project traffic. Below is a listing of each of the study intersections warranting improvements, the corresponding improvements that the proposed project would be required to pay a Fair-Share of Improvement cost towards, and the proposed project's equitable share of these improvements. The proposed project's equitable share was calculated using the method for calculating equitable mitigation measures outlined in the *Caltrans Guide for the Preparation of Traffic Impact Studies* (State of California, DOT, December 2002), which is shown below:

$$P = T / (T_B - T_E) \text{ where,}$$

P = The equitable share for the project's traffic impact.

T = The vehicle trips generated by the project during the peak hour of adjacent roadway facility in vehicles per hour (vph).

T_B = The forecasted traffic volume on an impacted roadway facility at the time of general plan build-out (e.g. 20-year model or the furthest model date feasible), vph.

T_E = The traffic volume existing on the impacted roadway facility plus other approved projects that will generate traffic that has yet to be constructed/opened, vph.

Note that the percent Fair-Share calculated using the above formula was reported to the nearest whole number and the calculations are based on the highest Fair-Share percentage from both peak hour scenarios.

Year 2040 with Rancheria Plus Project Fair-Share

Upon the City's direction, Fair-Share cost calculations were conducted for only the Cumulative (Year 2040) conditions.

Intersections

Table 15 on the following page presents a summary of the Fair-Share cost calculations performed for intersections with significant impacts for the *Year 2040 with Rancheria Plus Project* conditions.

TABLE 15
SUMMARY OF FAIR SHARE CALCULATIONS FOR INTERSECTIONS

#	Intersection Name	T	Tb	Te	P
5	S. Bonnyview Road & Bechelli Lane	1027	4634	1851	37%
7	S. Bonnyview Road & I-5 SB Ramps	1025	4411	1873	40%
8	S. Bonnyview Road & I-5 NB Ramps	600	3458	1654	33%
11	Churn Creek Road & Hartmeyer Lane	80	1663	1015	12%
13	Churn Creek Road & Victor Avenue	130	1336	755	22%
14	Churn Creek Road & Rancho Road	51	1208	823	13%
21	Bechelli Lane & Loma Vista Drive	39	1278	879	10%

Roadways

Table 16 below presents a summary of the Fair-Share cost calculations performed for roadways with significant impacts for the *Year 2040 with Rancheria Plus Project* conditions.

TABLE 16
SUMMARY OF FAIR SHARE CALCULATIONS FOR ROADWAY SEGMENTS

#	Roadway Segment Name	Begin	End	T	Tb	Te	P
1	S. Bonnyview Road	SR 273	Churn Creek	517	3328	2138	43%
4	Bechelli Lane	Bonnyview Road	Chinook Drive	341	1543	732	42%

Freeway Mainline Segments and Ramps

Table 17 below presents a summary of the fair share cost calculations performed for roadways with significant impacts for the *Year 2040 with Rancheria Plus Project* conditions.

TABLE 17
SUMMARY OF FAIR SHARE CALCULATIONS FOR FREEWAY MAINLINE SEGMENTS AND RAMPS

#	Freeway Segment/Ramp Name	Begin	End	T	Tb	Te	P
9	I-5 SB from S. Bonnyview Road to Knighton Road	S. Bonnyivew Rd	Knighton Rd	114	3740	2453	9%

Development Impact Fee Program

The following development impact fee programs include transportation facility improvements that may be applicable to this project:

- I-5/South Bonnyview Road Interchange: Cost TBD
- Churn Creek Road/Victor Avenue/Rancho Road Roundabout: Cost TBD

Shasta County Public Facilities Fee

- I-5/South Bonnyview Phase I: $7,000,000.
- I-5/South Bonnyview Phase II: $10,000,000.

Shasta County Major Road Impact Fee Program

- South Bonnyview Road/Churn Creek Road: SR 273 to Rancho Road. Construct separation, widen, add signals. I-5 Interchange improvements including reconstruction of the overcrossing and bridge. $20,750,000.

Appendix

An appendix is included that contains all Rancheria analysis including: Intersection Turning Movement Counts, Synchro Outputs, HCS Outputs, and Signal Warrant Analysis Worksheets.