

BLACK MOUNTAIN ROAD TRANSPORTATION IMPACT STUDY (8TH SUBMITTAL)

May 2016

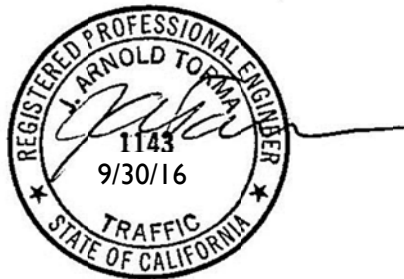


BLACK MOUNTAIN ROAD TRANSPORTATION IMPACT STUDY (8TH SUBMITTAL)

May 2016

On Behalf Of:

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EXECUTIVE SUMMARY

Black Mountain Road is designated a 6-Lane Primary Arterial in the Rancho Peñasquitos Community Plan, which is part of the General Plan of the City of San Diego. Black Mountain Road currently functions as a 4-Lane Major. A Community Plan Amendment has been initiated at the request of the Black Mountain Ranch developer to reclassify Black Mountain Road to a 4-Lane Major from Twin Trails Drive on the north to the southern community boundary. For analysis purposes, the proposed reclassification of this segment of Black Mountain Road to a 4-Lane Major is considered the “Project”.

The Rancho Peñasquitos community is located approximately 17 miles to the north of downtown San Diego and approximately 8 miles to the east of the Pacific Ocean. The extent of the study area was determined in consultation with City staff, along with their knowledge of the transportation system in the northern area of the City. Within this study area, 57 intersections and 37 roadway segments were selected for analysis. Daily traffic volumes along roadway segments were obtained through machine data collection. Intersection turning movement counts were conducted during the weekday morning peak period from 7:00 AM to 9:00 AM and evening peak period from 4:00 PM to 6:00 PM. The dates on which the segment and intersection counts were conducted range during the period of October, 2013 to July, 2014.

As the Project is the reclassification of a segment of Black Mountain Road to a 4-Lane Major, it itself is not a trip generator. Instead, the future traffic is derived from existing and future development within and around the study area, a large geographic area, and not by a single development site. For the study area, horizon year traffic volumes on the roadway network were estimated based on SANDAG’s daily traffic volume forecasts. SANDAG’s calibrated and validated base model (Series 12, base year 2008), was used for the base year and their 2050 model used for the horizon year, the latter reflecting build-out of the community plan. Horizon year daily volume forecasts were provided for two conditions: Without Project, which assumed the subject Black Mountain Road segment as a 6-Lane Primary Arterial, and With Project, which assumed the subject Black Mountain Road segment as a 4-Lane Major. The models included horizon year improvements and changes to the circulation network in the Rancho Peñasquitos area. (See Chapter 4 for network improvements in the horizon year as well as funding sources for these projects) These forecasted volumes along with the traffic counts were used to develop traffic growth factors and future condition volumes at each study segment and study intersection.

Significant traffic impacts due to volume changes associated with the Project were determined. Significant segment impacts were found for Black Mountain Road south of Twin Trails Drive and for Black Mountain Road north of Park Village Road-Adolphia Street. These impacts will be unmitigated as maintaining Black Mountain Road at its current classification of 4 lanes is the project.

A single significant intersection impact occurs during the AM peak hour at the intersection of Sundance Avenue and Twin Trails Drive. To mitigate this impact, a traffic signal is recommended to replace the all-way stop control. This upgrade would improve the level of service from LOS E to LOS A and fully mitigate the significant impact. Traffic signal peak hour warrants were conducted for existing conditions and 2050 with project conditions and indicate that this signal will be warranted in the future. This warrant can be found in Appendix J. This mitigation is not found in any PFFP or Regional Plan. Partial mitigation may be provided by modifying the PFFPs of those communities currently providing funding for the widening of Black Mountain Road to substitute this mitigation for the widening project currently included in those PFFPs. See Appendix O for potential PFFP modifications to project T-11.1 of the Pacific Highlands, project T-57 of Black Mountain Ranch, and project T-2D of Rancho Penasquitos plans.

One significant freeway mainline impact was found within the study area. The freeway mainline significant impact was found in the PM peak hour on eastbound SR-56 between Camino del Sur and Black Mountain Road. This impact could be mitigated by the construction of an additional eastbound

auxiliary lane from Camino del Sur to Black Mountain Road. This mitigation is not found in any PFFP, Regional or Caltrans Plan. Partial mitigation may be provided by modifying the PFFPs of those communities currently providing funding for the widening of Black Mountain Road to substitute this mitigation for the widening project currently included in those PFFPs. See Appendix O for potential PFFP modifications to project T-11.1 of the Pacific Highlands, project T-57 of Black Mountain Ranch, and project T-2D of Rancho Penasquitos plans.

One ramp metering delay impact was also found within the study area. In the AM peak hour, the Rancho Penasquitos Blvd – SR56 WB on ramp experiences an increase in delay of 3 minutes from about 21 minutes to 24 minutes, resulting in a significant impact. This impact could be mitigated by the construction of an additional ramp lane onto westbound SR-56 at this location. This mitigation is not found in any PFFP, Regional or Caltrans Plan. Partial mitigation may be provided by modifying the PFFPs of those communities currently providing funding for the widening of Black Mountain Road to substitute this mitigation for the widening project currently included in those PFFPs. See Appendix O for potential PFFP modifications to project T-11.1 of the Pacific Highlands, project T-57 of Black Mountain Ranch, and project T-2D of Rancho Penasquitos plans.

While not a significant impact, to improve the traffic flow along Black Mountain Road at SR-56, a restriping of the segment between the SR-56 westbound ramps and SR-56 eastbound ramps is recommended, as there is currently width for an additional northbound lane. This restriping would include an additional northbound lane along Black Mountain Road from the SR-56 eastbound ramps to the middle of the overpass. The inside lane would terminate into the dual left-turn pockets, designating the two outer lanes as exclusively through lanes as shown in Appendix K. This modification would increase the northbound-to-westbound left-turn pocket storage and improve flow of northbound through traffic. To accommodate the offsets from this restriping, the roadway will need to be widened for northbound traffic north of the bridge to accommodate a transition taper as shown in Appendix K. Although this reconfiguration and widening on the northeast corner would improve the traffic flow along Black Mountain Road at SR-56, the segments of Black Mountain Road south of Twin Trails Drive and north of Park Village Road would remain significantly impacted.

Tables ES-1, ES-2, ES-3, ES-4, and ES-5 below, respectively summarize roadway segment, peak hour intersection, freeway mainline and freeway ramp metering conditions for the existing conditions, horizon year without project and horizon year with project scenarios. For all assumptions, calculations, explanations in derivation and methodology, please refer to the more in depth analyses found in Chapters 1-4.

Table ES-I
Summary of Weekday Roadway Segment Conditions

Segment Number and Name	2014 Existing		2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		Comparison	
	V/C	LOS	V/C	LOS	V/C	LOS	Δ V/C	Impact
1. Camino Del Sur s/o Carmel valley Road	0.443	B	0.518	B	0.505	B	-0.01	No
2. Camino Del Sur s/o Wolverine Way - Fallhaven Road	0.518	B	0.605	C	0.590	C	-0.02	No
3. Camino Del Sur n/o SR-56 Westbound Ramps	0.648	C	0.757	C	0.738	C	-0.02	No
4. Camino Del Sur s/o SR-56 Eastbound Ramps	0.245	A	0.534	B	0.548	B	0.01	No
5. Carmel Valley Road w/o Black Mountain Road	1.049	F	0.431	B	0.434	B	0.00	No
6. Carmel Valley Road e/o Black Mountain Road	0.345	A	0.566	C	0.570	C	0.00	No
7. Black Mountain Road n/o Maler Road	0.308	A	0.457	B	0.480	B	0.02	No
8. Black Mountain Road s/o Oviedo Street	0.474	B	0.589	C	0.587	C	0.00	No
9. Black Mountain Road s/o Carmel Mountain Road	0.369	A	0.459	B	0.443	B	-0.02	No
10. Black Mountain Road bet. Paseo Montalban & Twin Trails Drive	0.358	A	0.446	B	0.430	B	-0.02	No
11. Black Mountain Road s/o Twin Trails Drive	0.837	D	0.634	C	0.939	E	0.31	Yes
12. Black Mountain Road bet. SR-56 Westbound & Eastbound Ramps	0.764	D	0.578	B	0.857	D	0.28	No
13. Black Mountain Road n/o Park Village Road - Adolphia Street	0.886	E	0.732	C	0.888	E	0.16	Yes
14. Black Mountain Road n/o Canyonside Park Drive	0.760	D	0.674	C	0.867	D	0.19	No
15. Black Mountain Road bet. Mercy Road & Babuta Road	0.481	B	0.640	C	0.549	B	-0.09	No
16. Black Mountain Road s/o Westview Parkway	0.370	A	0.493	B	0.423	B	-0.07	No
17. Westview Parkway e/o Black Mountain Road	0.203	A	0.295	A	0.240	A	-0.06	No
18. Carmel Mountain Road bet. Paseo Aldabra & Sundevil Way	0.354	A	0.367	A	0.370	A	0.00	No
19. Carmel Mountain Road bet. Paseo Montalban & SR-56 Westbound Ramps	0.548	C	0.567	C	0.574	C	0.01	No
20. Rancho Penasquitos Blvd bet. SR-56 EB Ramps - Azuaga St & Calle De Las Rosas	0.686	C	0.655	C	0.688	C	0.03	No
21. Rancho Penasquitos Boulevard bet. Calle De Las Rosas & Via Del Sud	0.703	C	0.672	C	0.705	C	0.03	No
22. Rancho Penasquitos Boulevard bet. Paseo Montril & I-15 Southbound Ramps	0.827	D	0.790	D	0.828	D	0.04	No
23. Poway Road e/o I-15 Northbound Ramps	0.751	C	0.887	D	0.887	D	0.00	No
24. Carmel Mountain Road s/o Sundance Avenue	0.124	A	0.245	A	0.250	A	0.01	No
25. Carmel Mountain Road w/o Sparren Avenue	0.170	A	0.222	A	0.233	A	0.01	No
26. Carmel Mountain Road w/o Black Mountain Road	0.208	A	0.260	A	0.265	A	0.01	No
27. Sundance Avenue w/o War Bonnet Street*	-	-	-	-	-	-	-	-
28. Carmel Mountain Road e/o Freeport Road	0.283	A	0.361	A	0.360	A	0.00	No
29. Carmel Mountain Road bet. Penasquitos Drive & Gerana Street	0.341	A	0.435	B	0.434	B	0.00	No
30. Carmel Mountain Road bet. I-15 Southbound Ramps & Penasquitos Drive	0.627	C	0.736	C	0.733	C	0.00	No
31. Carmel Mountain Road e/o I-15 Northbound Ramps	0.749	C	0.880	D	0.877	D	0.00	No
32. Camino Del Sur n/o Park Village Road	0.030	A	0.268	A	0.255	A	-0.01	No
33. Park Village Road e/o Camino Del Sur	0.211	A	0.315	A	0.293	A	-0.02	No
34. Park Village Road w/o Black Mountain Road	0.439	B	0.444	B	0.440	B	0.00	No
35. Mercy Road bet. Chabola Road & Branicole Ln	0.357	A	0.467	B	0.436	B	-0.03	No
36. Mercy Road n/o Alemania Road	0.496	B	0.592	C	0.561	C	-0.03	No
37. Scripps Poway Parkway e/o I-15 Northbound Ramps	0.880	D	1.057	F	1.033	F	-0.02	No

* Capacity for local residential street not specified in *San Diego Traffic Impact Study Manual, July 2008*.

Table ES-2
Summary of AM Peak Hour Intersection Conditions

Intersection Number and Name	2014 Existing		2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		Comparison	
	Delay	LOS	Delay	LOS	Delay	LOS	Δ Delay	Impact
1. Camino Del Sur/Carmel Valley Road ***	41.1	D	56.7	E	56.0	E	-0.7	No
2. Camino Del Sur/Watson Ranch Road ***	10.3	B	8.4	A	8.3	A	-0.1	No
3. Camino Del Sur/Wolverine Way - Fallhaven Road ***	25.3	C	22.2	C	20.4	C	-1.8	No
4. Camino Del Sur/Torrey Meadows Drive	18.1	B	16.5	B	16.7	B	0.2	No
5. Camino Del Sur/Highlands Village Place ***	19.3	B	15.4	B	14.9	B	-0.5	No
6. Camino Del Sur/SR-56 Westbound Ramps	15.6	B	17.5	B	17.8	B	0.3	No
7. Camino Del Sur/SR-56 Eastbound Ramps ***	15.9	B	10.4	B	10.2	B	-0.2	No
8. Camino Del Sur/Torrey Santa Fe Road ***	13.8	B	13.4	B	13.3	B	-0.1	No
9. Black Mountain Road/Carmel Valley Road	23.3	C	22.3	C	22.5	C	0.2	No
10. Black Mount Road/Maler Road ***	7.6	A	7.8	A	8.0	A	0.2	No
11. Black Mountain Road/Stargaze Avenue ***	15.7	B	14.7	B	13.4	B	-1.3	No
12. Black Mountain Road/Oviedo Street	16.8	B	17.0	B	26.3	C	9.3	No
13. Black Mountain Road/Carmel Mountain Road	47.4	D	44.0	D	47.9	D	3.9	No
14. Black Mountain Road/Paseo Montalban	13.4	B	12.4	B	12.8	B	0.4	No
15. Black Mountain Road/Twin Trails Drive	43.2	D	52.9	D	54.4	D	1.5	No
16. Black Mountain Road/SR-56 Westbound Ramps ***	37.9	D	47.3	D	45.0	D	-2.3	No
17. Black Mountain Road/SR-56 Eastbound Ramps	22.0	C	22.4	C	23.1	C	0.7	No
18. Black Mountain Road/Park Village Road - Adolphia Street	46.3	D	33.9	C	37.3	D	3.4	No
19. Black Mountain Road/Canyonside Park Drive	2.3	A	2.5	A	5.2	A	2.7	No
20. Black Mountain Road/Mercy Road	29.8	C	24.4	C	27.4	C	3.0	No
21. Black Mountain Road/Westview Parkway ***	13.4	B	16.3	B	14.5	B	-1.8	No
22. Carmel Mountain Road/Sundevil Way ***	20.2	C	16.0	B	15.6	B	-0.4	No
23. Carmel Mountain Road/Paseo Montalban ***	24.6	C	24.0	C	23.8	C	-0.2	No
24. Carmel Mountain Road/SR-56 WB Ramps - Rancho Penasquitos Boulevard	41.9	D	45.7	D	46.0	D	0.3	No
25. Rancho Penasquitos Boulevard/SR-56 Eastbound Ramps - Azuaga Street ***	20.6	C	24.8	C	24.2	C	-0.6	No
26. Rancho Penasquitos Boulevard/Calle De Las Rosas ***	10.1	B	10.3	B	9.9	A	-0.4	No
27. Rancho Penasquitos Boulevard/Via Del Sud	4.5	A	4.3	A	4.6	A	0.3	No
28. Rancho Penasquitos Boulevard/Paseo Montrail	13.5	B	13.6	B	13.6	B	0.0	No
29. Rancho Penasquitos Boulevard/I-15 Southbound Off-Ramp	7.9	A	8.2	A	8.4	A	0.2	No
30. Rancho Penasquitos Boulevard/I-15 Northbound Off-Ramp	10.9	B	15.0	B	15.6	B	0.6	No
31. Carmel Mountain Road/(West) Sundance Avenue	13.8	B	12.9	B	12.9	B	0.0	No
32. Carmel Mountain Road/Sedurus Street (All-way stop control)*	7.5	A	8.2	A	8.1	A	-0.1	No
33. Carmel Mountain Road/Entreken Way	21.3	C	22.6	C	22.6	C	0.0	No
34. Sparren Avenue/Carmel Mountain Road ***	24.1	C	32.1	C	28.2	C	-3.9	No
35. Twin Trails Drive/Carmel Mountain Road	28.8	C	25.9	C	29.5	C	3.6	No
36. (East) Sundance Avenue/Carmel Mountain Road (Two-way stop control) **	18.4	C	15.5	C	15.2	C	-0.3	No
37. Sundance Avenue/Twin Trails Drive (All-way stop control)	22.7	C	38.8	E	46.4	E	7.6	Yes
38. Penasquitos Post Office Driveway/Twin Trails Drive	18.2	B	18.3	B	18.4	B	0.1	No
39. Twin Trails Drive/Fairgrove Lane (All-way stop control)	8.0	A	8.0	A	8.1	A	0.1	No
40. Twin Trails Drive/Paseo Montalban	11.0	B	11.0	B	11.1	B	0.1	No
41. Salmon River Road/Paseo Montalban ***	13.6	B	13.9	B	13.2	B	-0.7	No
42. Salmon River Road/Fairgrove Lane (All-way stop control)	8.0	A	8.0	A	8.0	A	0.0	No
43. Salmon River Road/Adolphia Street - Limar Way (All-way stop control)	7.5	A	7.5	A	7.5	A	0.0	No
44. Paseo Cardiel/Carmel Mountain Road	23.1	C	20.2	C	20.3	C	0.1	No
45. Freeport Road/Carmel Mountain Road	8.8	A	5.8	A	6.4	A	0.6	No
46. Stoney Creek Road/Carmel Mountain Road ***	10.5	B	9.0	A	8.9	A	-0.1	No
47. Cuca Street - Caminata Deluz/Carmel Mountain Road	14.0	B	12.2	B	12.2	B	0.0	No
48. Penasquitos Drive/Carmel Mountain Road	28.9	C	29.0	C	29.0	C	0.0	No
49. I-15 Southbound Ramps/Carmel Mountain Road	18.2	B	19.7	B	20.1	C	0.4	No
50. I-15 Northbound Ramps/Carmel Mountain Road	21.9	C	25.2	C	25.3	C	0.1	No
51. Camino Del Sur/Park Village Road ***	24.5	C	51.6	D	45.6	D	-6.0	No
52. Rumex Lane/Park Village Road	7.9	A	7.8	A	7.9	A	0.1	No
53. Ragweed Street/Park Village Road	15.9	B	16.0	B	16.4	B	0.4	No
54. Mercy Road/Kika Court	8.0	A	7.8	A	7.8	A	0.0	No
55. Alemania Road/Mercy Road	9.4	A	9.8	A	9.9	A	0.1	No
56. I-15 Southbound Ramps/Mercy Road ***	31.0	C	35.5	D	34.8	C	-0.7	No
57. I-15 Northbound Ramps/Mercy Road - Scripps Poway Parkway ***	39.0	D	77.0	E	70.1	E	-6.9	No

Timing and Phasing Source: City of San Diego Timing Sheets - See Appendix B

* Assumes a signalization upgrade in 2050.

** Worst case control delay and LOS shown.

*** Positive improvements in avg. intersection delay are due to shift in traffic patterns and the re-optimization of the analysis for the intersection.

Table ES-3
Summary of PM Peak Hour Intersection Conditions

Intersection Number and Name	2014 Existing		2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		Difference	
	Delay	LOS	Delay	LOS	Delay	LOS	Δ Delay	Impact
1. Camino Del Sur/Carmel Valley Road ***	33.3	C	45.9	D	45.4	D	-0.5	No
2. Camino Del Sur/Watson Ranch Road ***	9.4	A	6.7	A	5.6	A	-1.1	No
3. Camino Del Sur/Wolverine Way - Fallhaven Road ***	17.9	B	20.2	C	18.3	B	-1.9	No
4. Camino Del Sur/Torrey Meadows Drive	21.0	C	13.7	B	14.0	B	0.3	No
5. Camino Del Sur/Highlands Village Place	13.2	B	16.6	B	16.8	B	0.2	No
6. Camino Del Sur/SR-56 Westbound Ramps	16.3	B	19.7	B	20.2	C	0.5	No
7. Camino Del Sur/SR-56 Eastbound Ramps	23.4	C	16.8	B	16.8	B	0.0	No
8. Camino Del Sur/Torrey Santa Fe Road	15.8	B	19.2	B	19.7	B	0.5	No
9. Black Mountain Road/Carmel Valley Road	50.2	D	47.9	D	48.8	D	0.9	No
10. Black Mount Road/Maler Road	7.5	A	7.5	A	7.6	A	0.1	No
11. Black Mountain Road/Stargaze Avenue	15.4	B	14.0	B	14.8	B	0.8	No
12. Black Mountain Road/Oviedo Street	16.0	B	17.6	B	26.0	C	8.4	No
13. Black Mountain Road/Carmel Mountain Road ***	36.5	D	28.5	C	28.3	C	-0.2	No
14. Black Mountain Road/Paseo Montalban	13.4	B	14.8	B	15.1	B	0.3	No
15. Black Mountain Road/Twin Trails Drive ***	38.8	D	40.5	D	32.0	C	-8.5	No
16. Black Mountain Road/SR-56 Westbound Ramps	29.6	C	34.4	C	34.7	C	0.3	No
17. Black Mountain Road/SR-56 Eastbound Ramps	23.9	C	26.1	C	26.2	C	0.1	No
18. Black Mountain Road/Park Village Road - Adolphia Street ***	26.1	C	29.7	C	29.4	C	-0.3	No
19. Black Mountain Road/Canyonside Park Drive	4.8	A	4.8	A	6.8	A	2.0	No
20. Black Mountain Road/Mercy Road ***	25.3	C	37.2	D	31.8	C	-5.4	No
21. Black Mountain Road/Westview Parkway ***	16.1	B	22.7	C	20.5	C	-2.2	No
22. Carmel Mountain Road/Sundevil Way	16.8	B	14.6	B	14.6	B	0.0	No
23. Carmel Mountain Road/Paseo Montalban	33.4	C	23.3	C	23.1	C	-0.2	No
24. Carmel Mountain Road/SR-56 WB Ramps - Rancho Penasquitos Boulevard **	34.3	C	35.6	D	35.3	D	-0.3	No
25. Rancho Penasquitos Boulevard/SR-56 Eastbound Ramps - Azuaga Street ***	51.3	D	70.7	E	69.4	E	-1.3	No
26. Rancho Penasquitos Boulevard/Calle De Las Rosas	10.0	A	9.5	A	10.0	A	0.5	No
27. Rancho Penasquitos Boulevard/Via Del Sud	4.3	A	3.9	A	4.5	A	0.6	No
28. Rancho Penasquitos Boulevard/Paseo Montrail	14.6	B	14.5	B	14.5	B	0.0	No
29. Rancho Penasquitos Boulevard/I-15 Southbound Off-Ramp	9.4	A	9.7	A	9.7	A	0.0	No
30. Rancho Penasquitos Boulevard/I-15 Northbound Off-Ramp	14.9	B	19.4	B	20.6	C	1.2	No
31. Carmel Mountain Road/(West) Sundance Avenue	16.1	B	16.0	B	16.5	B	0.5	No
32. Carmel Mountain Road/Sedorus Street (All-way stop control)*	7.4	A	5.2	A	5.1	A	-0.1	No
33. Carmel Mountain Road/Entrecken Way ***	13.4	B	12.6	B	12.5	B	-0.1	No
34. Sparren Avenue/Carmel Mountain Road	24.0	C	20.1	C	20.2	C	0.1	No
35. Oviedo Street/Carmel Mountain Road ***	16.7	B	20.1	C	19.6	B	-0.5	No
36. (East) Sundance Avenue/Carmel Mountain Road (Two-way stop control)**	9.9	A	10.3	B	10.3	B	0.0	No
37. Sundance Avenue/Twin Trails Drive (All-way stop control)	14.9	B	23.8	C	27.5	D	3.7	No
38. Penasquitos Post Office Driveway/Twin Trails Drive ***	26.7	C	26.6	C	26.1	C	-0.5	No
39. Twin Trails Drive/Fairgrove Lane (All-way stop control)	9.0	A	9.1	A	9.2	A	0.1	No
40. Twin Trails Drive/Paseo Montalban	12.9	B	12.9	B	13.0	B	0.1	No
41. Salmon River Road/Paseo Montalban ***	15.1	B	15.1	B	11.9	B	-3.2	No
42. Salmon River Road/Fairgrove Lane (All-way stop control)	8.8	A	8.8	A	8.9	A	0.1	No
43. Salmon River Road/Adolphia Street - Limar Way (All-way stop control)	7.9	A	7.9	A	7.9	A	0.0	No
44. Paseo Cardiel/Carmel Mountain Road	29.1	C	25.1	C	27.3	C	2.2	No
45. Freeport Road/Carmel Mountain Road	7.8	A	5.1	A	7.5	A	2.4	No
46. Stoney Creek Road/Carmel Mountain Road ***	3.6	A	4.2	A	3.7	A	-0.5	No
47. Cuca Street - Caminata Deluz/Carmel Mountain Road ***	10.9	B	10.9	B	10.8	B	-0.1	No
48. Penasquitos Drive/Carmel Mountain Road ***	28.1	C	30.9	C	30.8	C	-0.1	No
49. I-15 Southbound Ramps/Carmel Mountain Road	25.3	C	35.4	D	35.5	D	0.1	No
50. I-15 Northbound Ramps/Carmel Mountain Road	27.3	C	50.5	D	51.4	D	0.9	No
51. Camino Del Sur/Park Village Road	19.3	B	23.7	C	23.8	C	0.1	No
52. Rumex Lane/Park Village Road	7.1	A	6.9	A	7.0	A	0.1	No
53. Ragweed Street/Park Village Road	16.1	B	16.1	B	16.6	B	0.5	No
54. Mercy Road/Kika Court ***	7.4	A	8.3	A	7.5	A	-0.8	No
55. Alemania Road/Mercy Road ***	10.3	B	10.6	B	10.3	B	-0.3	No
56. I-15 Southbound Ramps/Mercy Road ***	33.0	C	40.5	D	37.6	D	-2.9	No
57. I-15 Northbound Ramps/Mercy Road - Scripps Poway Parkway ***	34.8	C	61.7	E	52.9	D	-8.8	No
Timing and Phasing Source: City of San Diego Signal Timing Sheets - See Appendix B								
* Assumes a signalization upgrade in 2050.								
** Worst case control delay and LOS shown.								
*** Positive improvements in avg. intersection delay are due to shift in traffic patterns and the re-optimization of the analysis for the intersection.								

Table ES-4
Summary of Freeway Mainline Conditions

Freeway Segment	AM/ PM	LOS E Capacity	Existing Conditions		Long Term Without Project (BMR 6-Lanes)		Long Term With Project (BMR 4-Lanes)		Comparison	
			V/C	LOS	V/C	LOS	V/C	LOS	Δ V/C	Significant?
SR-56 Westbound										
West of Camino del Sur	AM	7,050	0.902	D	1.132	F	1.136	F	0.004	No
	PM	7,050	0.332	A	0.417	B	0.418	B	0.001	No
Camino del Sur to Black Mountain Rd	AM	7,050	0.999	E	1.119	F	1.124	F	0.005	No
	PM	7,050	0.367	A	0.412	B	0.414	B	0.002	No
Black Mountain Road to Rancho Penasquitos Blvd *	AM	8,850	0.762	C	0.808	D	0.798	C	-0.010	No
	PM	8,850	0.280	A	0.297	A	0.294	A	-0.003	No
Rancho Penasquitos Blvd to I-15 Interchange *	AM	7,050	0.985	E	0.997	E	0.983	E	-0.014	No
	PM	7,050	0.362	A	0.367	A	0.362	A	-0.005	No
SR-56 Eastbound										
West of Camino del Sur	AM	7,050	0.346	A	0.434	B	0.436	B	0.002	No
	PM	7,050	0.885	D	1.112	F	1.115	F	0.003	No
Camino del Sur to Black Mountain Rd	AM	7,050	0.383	A	0.429	B	0.431	B	0.002	No
	PM	7,050	0.981	E	1.098	F	1.104	F	0.006	Yes
Black Mountain Road to Rancho Penasquitos Blvd *	AM	7,050	0.270	A	0.389	A	0.384	A	-0.005	No
	PM	7,050	0.690	C	0.995	E	0.983	E	-0.012	No
Rancho Penasquitos Blvd to I-15 Interchange *	AM	7,050	0.378	A	0.382	A	0.377	A	-0.005	No
	PM	7,050	0.967	E	0.978	E	0.965	E	-0.013	No
I-15 Northbound										
South of Mercy Road *	AM	16,910	0.725	C	1.245	F	1.239	F	-0.006	No
	PM	16,910	0.534	B	0.917	D	0.913	D	-0.004	No
Mercy Road to Rancho Penasquitos Blvd *	AM	16,910	0.687	C	1.210	F	1.195	F	-0.015	No
	PM	16,910	0.506	B	0.892	D	0.881	D	-0.011	No
Rancho Penasquitos Blvd to Ted Williams Pkwy *	AM	15,110	0.674	C	1.246	F	1.232	F	-0.014	No
	PM	15,110	0.497	B	0.918	D	0.908	D	-0.010	No
Ted Williams Pkwy to Carmel Mountain Rd *	AM	16,910	0.667	C	1.094	F	1.094	F	0.000	No
	PM	16,910	0.491	B	0.807	D	0.806	D	-0.001	No
North of Carmel Mountain Rd	AM	16,910	0.692	C	1.145	F	1.146	F	0.001	No
	PM	16,910	0.422	B	0.699	C	0.700	C	0.001	No
I-15 Southbound										
South of Mercy Road *	AM	16,910	0.532	B	0.913	D	0.909	D	-0.004	No
	PM	16,910	0.716	C	1.230	F	1.224	F	-0.006	No
Mercy Road to Rancho Penasquitos Blvd *	AM	16,910	0.504	B	0.888	D	0.877	D	-0.011	No
	PM	16,910	0.679	C	1.196	F	1.181	F	-0.015	No
Rancho Penasquitos Blvd to Ted Williams Pkwy *	AM	16,910	0.442	B	0.817	D	0.808	D	-0.009	No
	PM	16,910	0.596	B	1.100	F	1.088	F	-0.012	No
Ted Williams Pkwy to Carmel Mountain Rd	AM	16,910	0.489	B	0.803	D	0.803	D	0.000	No
	PM	16,910	0.659	C	1.081	F	1.081	F	0.000	No
North of Carmel Mountain Rd	AM	15,110	0.338	A	0.559	B	0.560	B	0.001	No
	PM	15,110	0.773	C	1.279	F	1.280	F	0.001	No

Peak Hour Volume = (ADT)(K)(D)/(Truck Factor)

V/C = Peak Hour Volume / Capacity

Truck Source: 2013 Annual Average Daily Truck Traffic on the California State Highway System

ADT Source: SANDAG Modeling (Appendix E)

K/D Source: 2013 K and D Factors on the California State Highway System

* Improvement in Change in V/C Ratio are due to shift in traffic patterns

**Table ES-5
Summary of Freeway Ramp Metering Conditions**

Location	# of Lane	Meter Rate (veh/hr/ lane)	Existing Conditions		Horizon Year Without Project		Horizon Year With Project		Comparison	
			Delay (min)	Queue (ft)	Delay (min)	Queue (ft)	Delay (min)	Queue (ft)	Δ Delay	Impact
AM Peak Hour										
Camino del Sur - SR56 WB Ramp	2	435	0	0	0	0	0	0	0	No
Camino del Sur - SR56 WB Ramp (HOV)	1	435	0	0	0	0	0	0	0	No
Black Mountain Rd - SR56 WB Ramp *	2	520	17	8,729	28	14,027	27	13,427	-1	No
Black Mountain Rd - SR56 WB Ramp (HOV)	1	520	0	0	0	0	0	0	0	No
Rancho Penasquitos - SR56 WB Ramp	1	600	16	4,553	21	6,119	24	6,815	3	Yes
Carmel Mountain Rd - I15 SB Ramp	2	367	3	1,134	14	5,075	14	4,971	0	No
Carmel Mountain Rd - I15 SB Ramp (HOV)	1	367	0	0	0	0	0	0	0	No
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	2	492	30	14,094	46	21,721	46	21,837	0	No
Rancho Penasquitos - I15 SB Ramp - EB->SB	2	492	0	0	0	0	0	0	0	No
Mercy Rd - I15 SB Ramp *	2	420	18	7,221	32	13,172	28	11,214	-5	No
Mercy Rd - I15 SB Ramp (HOV)	1	420	0	0	0	0	0	0	0	No
PM Peak Hour										
Camino del Sur - SR56 EB Ramp *	2	480	0	0	16	7,317	14	6,273	-2	No
Camino del Sur - SR56 EB Ramp (HOV)	1	480	0	0	0	0	0	0	0	No
Black Mountain Rd - SR56 EB Ramp	2	600	0	0	0	0	0	0	0	No
Black Mountain Rd - SR56 EB Ramp (HOV)	1	600	0	0	0	0	0	0	0	No
Rancho Penasquitos - SR56 EB Ramp	2	300	0	0	0	0	0	0	0	No
Carmel Mountain Rd - I15 SB Ramp	2	473	6	2,555	17	7,801	17	7,671	0	No
Carmel Mountain Rd - I15 SB Ramp (HOV)	1	473	0	0	0	0	0	0	0	No
Carmel Mountain Rd - I15 NB Ramp	2	463	0	0	0	0	0	0	0	No
Carmel Mountain Rd - I15 NB Ramp (HOV)	1	463	0	0	0	0	0	0	0	No
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	2	576	0	0	0	0	0	0	0	No
Rancho Penasquitos - I15 SB Ramp - EB->SB	2	576	0	0	0	0	0	0	0	No
Rancho Penasquitos - I15 NB Ramp - WB->NB	1	335	17	2,755	31	4,988	31	5,017	0	No
Rancho Penasquitos - I15 NB Ramp - Loop EB->NB	1	335	0	0	0	0	0	0	0	No
Mercy Rd - I15 SB Ramp *	2	406	27	10,591	44	17,142	38	15,028	-5	No
Mercy Rd - I15 SB Ramp (HOV)	1	406	0	0	0	0	0	0	0	No
Mercy Rd - I15 NB Ramp *	2	270	46	11,902	67	17,435	64	16,704	-3	No

Source: Caltrans January 2015

Meter rate is based on the most restrictive meter rate provided by Caltrans, see Appendix I

HOV demand is equal to 10% of Total Demand

Total Demand onto all lanes of each Freeway Ramp is found in the vehicle turning movements in Figures 3-4 and 3-5

Combined Meter Rate = (Meter Rate per Lane) * (# of Lanes)

Excess Demand = (Demand * # of lanes) - (Combined Meter Rate); if Excess Demand < 0, then Excess Demand = 0

Delay = Excess Demand / Combined Meter Rate

Queue = Excess Demand * 29 ft/vehicle

* Improvement in average ramp delay is due to shift in traffic patterns

CHAPTER I THE PROJECT

Black Mountain Road is designated a 6-Lane Primary Arterial in the Rancho Peñasquitos Community Plan, which is part of the General Plan of the City of San Diego. Black Mountain Road currently functions as a 4-Lane Major. A Community Plan Amendment has been initiated by the City Planning Commission at the request of the Black Mountain Ranch developer to reclassify Black Mountain Road to a 4-Lane Major from Twin Trails Drive on the north to the southern community boundary. The Rancho Peñasquitos community is located approximately 17 miles to the north of downtown San Diego and approximately 8 miles to the east of the Pacific Ocean. It is bounded on the east by the communities of Carmel Mountain Ranch and Sabre Springs, on the south by the Los Peñasquitos Canyon Preserve and the Mira Mesa community, and on the west and north by subareas I and IV known as Black Mountain Ranch and Torrey Highlands and the Rancho Bernardo community planning area. Future development in this area is described in Chapter 4. The community is topographically diverse and is physically characterized by numerous canyons, hillsides and ridges.

This transportation impact study has been prepared to analyze and evaluate the reclassification of Black Mountain Road to a 4-Lane Major from Twin Trails Drive to the southern boundary of the Community of Rancho Peñasquitos. For analysis purposes, the proposed reclassification of this segment of Black Mountain Road to a 4-Lane Major is considered the “Project”. Figure I-1 shows the Project segment and surrounding area.

PROJECT DESCRIPTION

Black Mountain Road is a north-south roadway located west of Interstate 15 (I-15). Black Mountain Road is entirely within the City of San Diego, extending continuously from Carmel Valley Road on the north to Miramar Road on the south, a distance of approximately 6.6 miles. The northern half of Black Mountain Road is within and governed by the Rancho Peñasquitos Community Plan. The Project segment is within the northern half of Black Mountain Road. It is approximately 1.3 miles long from Twin Trails Drive on the north to the southern community boundary adjacent to the Los Peñasquitos Canyon Preserve. Currently, Black Mountain Road operates as a 4-Lane Major with landscaped medians, contiguous sidewalks and Class II bike lanes. The bridge section of Black Mountain Road that crosses State Route 56 (SR-56) is wider and operates as a 5-lane Primary Arterial.

The Project, the reclassification of Black Mountain Road to a 4-Lane Major from Twin Trails Drive to the southern community boundary, as initiated under a Community Plan Amendment, has been proposed in order to preserve the existing character of the community, as well as avoid the need to acquire private property necessary to expand Black Mountain Road to a six-lane facility.

A primary goal of the Community Plan is the construction and maintenance of an adequate system for vehicular, bicycle and pedestrian circulation. The expansion of Black Mountain Road to a 6-Lane Primary Arterial was identified as a primary roadway improvement to relieve congestion and mitigate impacts due to proposed development. Therefore, implementation of the Project would need to address traffic impacts resulting from Black Mountain Road not being improved to six lanes, as well as impacts to the bicycle and pedestrian networks.

STUDY AREA

The study area is a large area that includes numerous intersections and street segments expected to be affected by the Project. The extent of the study area was determined in consultation with City staff, along with their knowledge of the transportation system in the northern area of the City. Within this study area, 57 intersections and 37 roadway segments were selected for analysis, which are listed below and denoted in Figure I-2.

Intersections

Except as noted, all of the following intersections are signalized.

1. Camino Del Sur/Carmel Valley Road
2. Camino Del Sur/Watson Ranch Road
3. Camino Del Sur/Wolverine Way - Fallhaven Road
4. Camino Del Sur/Torrey Meadows Drive
5. Camino Del Sur/Highlands Village Place
6. Camino Del Sur/SR-56 Westbound Ramps
7. Camino Del Sur/SR-56 Eastbound Ramps
8. Camino Del Sur/Torrey Santa Fe Road
9. Black Mountain Road/Carmel Valley Road
10. Black Mount Road/Maler Road
11. Black Mountain Road/Stargaze Avenue
12. Black Mountain Road/Oviedo Street
13. Black Mountain Road/Carmel Mountain Road
14. Black Mountain Road/Paseo Montalban
15. Black Mountain Road/Twin Trails Drive
16. Black Mountain Road/SR-56 Westbound Ramps
17. Black Mountain Road/SR-56 Eastbound Ramps
18. Black Mountain Road/Park Village Road - Adolphia Street
19. Black Mountain Road/Canyonside Park Drive
20. Black Mountain Road/Mercy Road
21. Black Mountain Road/Westview Parkway
22. Carmel Mountain Road/Sundevil Way
23. Carmel Mountain Road/Paseo Montalban
24. Carmel Mountain Road/SR-56 Westbound Ramps - Rancho Peñasquitos Boulevard
25. Rancho Peñasquitos Boulevard/SR-56 Eastbound Ramps - Azuaga Street
26. Rancho Peñasquitos Boulevard/Calle De Las Rosas
27. Rancho Peñasquitos Boulevard/Via Del Sud
28. Rancho Peñasquitos Boulevard/Paseo Montrail
29. Rancho Peñasquitos Boulevard/I-15 Southbound Off-Ramp
30. Rancho Peñasquitos Boulevard/I-15 Northbound Off-Ramp
31. Carmel Mountain Road/(West) Sundance Avenue
32. Carmel Mountain Road/Sedorus Street *(All-way stop control)*
33. Carmel Mountain Road/Entreken Way
34. Sparren Avenue/Carmel Mountain Road
35. Twin Trails Drive/Carmel Mountain Road
36. (East) Sundance Avenue/Carmel Mountain Road *(Two-way stop control)*
37. Sundance Avenue/Twin Trails Drive *(All-way stop control)*
38. Peñasquitos Post Office Driveway/Twin Trails Drive
39. Twin Trails Drive/Fairgrove Lane *(All-way stop control)*
40. Twin Trails Drive/Paseo Montalban
41. Salmon River Road/Paseo Montalban
42. Salmon River Road/Fairgrove Lane *(All-way stop control)*
43. Salmon River Road/Adolphia Street - Limar Way *(All-way stop control)*
44. Paseo Cardiel/Carmel Mountain Road
45. Freeport Road/Carmel Mountain Road
46. Stoney Creek Road/Carmel Mountain Road
47. Cuca Street - Caminata Deluz/Carmel Mountain Road
48. Peñasquitos Drive/Carmel Mountain Road
49. I-15 Southbound Ramps/Carmel Mountain Road
50. I-15 Northbound Ramps/Carmel Mountain Road
51. Camino Del Sur/Park Village Road
52. Rumex Lane/Park Village Road

53. Ragweed Street/Park Village Road
54. Mercy Road/Kika Court
55. Alemania Road/Mercy Road
56. I-15 Southbound Ramps/Mercy Road
57. I-15 Northbound Ramps/Mercy Road - Scripps Poway Parkway

Roadway Segments

1. Camino Del Sur south of Carmel Valley Road
2. Camino Del Sur south of Wolverine Way - Fallhaven Road
3. Camino Del Sur north of SR-56 Westbound Ramps
4. Camino Del Sur south of SR-56 Eastbound Ramps
5. Carmel Valley Road west of Black Mountain Road
6. Carmel Valley Road east of Black Mountain Road
7. Black Mountain Road north of Maler Road
8. Black Mountain Road south of Oviedo Street
9. Black Mountain Road south of Carmel Mountain Road
10. Black Mountain Road between Paseo Montalban and Twin Trails Drive
11. Black Mountain Road south of Twin Trails Drive
12. Black Mountain Road between SR-56 Westbound and Eastbound Ramps
13. Black Mountain Road north of Park Village Road - Adolphia Street
14. Black Mountain Road north of Canyonside Park Drive
15. Black Mountain Road between Mercy Road and Babuta Road
16. Black Mountain Road south of Westview Parkway
17. Westview Parkway east of Black Mountain Road
18. Carmel Mountain Road between Paseo Aldabra and Sundevil Way
19. Carmel Mountain Road between Paseo Montalban and SR-56 Westbound Ramps
20. Rancho Peñasquitos Boulevard between SR-56 Westbound Ramps - Azuaga Street and Calle De Las Rosas
21. Rancho Peñasquitos Boulevard between Calle De Las Rosas and Via Del Sud
22. Rancho Peñasquitos Boulevard between Paseo Montrail and I-15 Southbound Ramps
23. Poway Road east of I-15 Northbound Ramps
24. Carmel Mountain Road south of Sundance Avenue
25. Carmel Mountain Road west of Sparren Avenue
26. Carmel Mountain Road west of Black Mountain Road
27. Sundance Avenue west of War Bonnet Street
28. Carmel Mountain Road east of Freeport Road
29. Carmel Mountain Road between Peñasquitos Drive and Gerana Street
30. Carmel Mountain Road between I-15 Southbound Ramps and Peñasquitos Drive
31. Carmel Mountain Road east of I-15 Northbound Ramps
32. Camino Del Sur north of Park Village Road
33. Park Village Road east of Camino Del Sur
34. Park Village Road west of Black Mountain Road
35. Mercy Road between Chabola Road and Branicole Lane
36. Mercy Road north of Alemania Road
37. Scripps Poway Parkway east of I-15 Northbound Ramps

PROJECT TRIP GENERATION

Vehicular trip generation is a measure or forecast of the number of trips that begin or end at a project site. In this case, there is no project or project site in the typical sense. As the Project is the reclassification of a segment of Black Mountain Road to a 4-Lane Major, it itself is not a trip generator. Instead, the trips are generated by the existing and future development within and around the study area, a large geographic area, and not by a single development site. The determination of the trips on the study area roadway network, including Black Mountain Road and the Project segment, is described below and in other sections of this report.

Traffic volume forecasts for the year 2050 for roadway network in the study area were developed and provided by the San Diego Association of Governments (SANDAG). These forecasts were produced from SANDAG's latest travel demand forecasting model, the primary long-range transportation planning tool in the San Diego region. The future traffic volumes for the study intersections and street segments and the methodology used to estimate those volumes are described in Chapter 4.

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution refers to the process of identifying the general destination of outbound trips and origins of inbound trips within a regional context. Trip assignment refers to the process of identifying the specific routes drivers would likely use to reach their destinations. The trip distribution and assignment of the future traffic volumes to the study area roadway network were intrinsically performed by the SANDAG model as part of its forecasting process for both the 4-lane major scenario and the 6-lane major scenario.

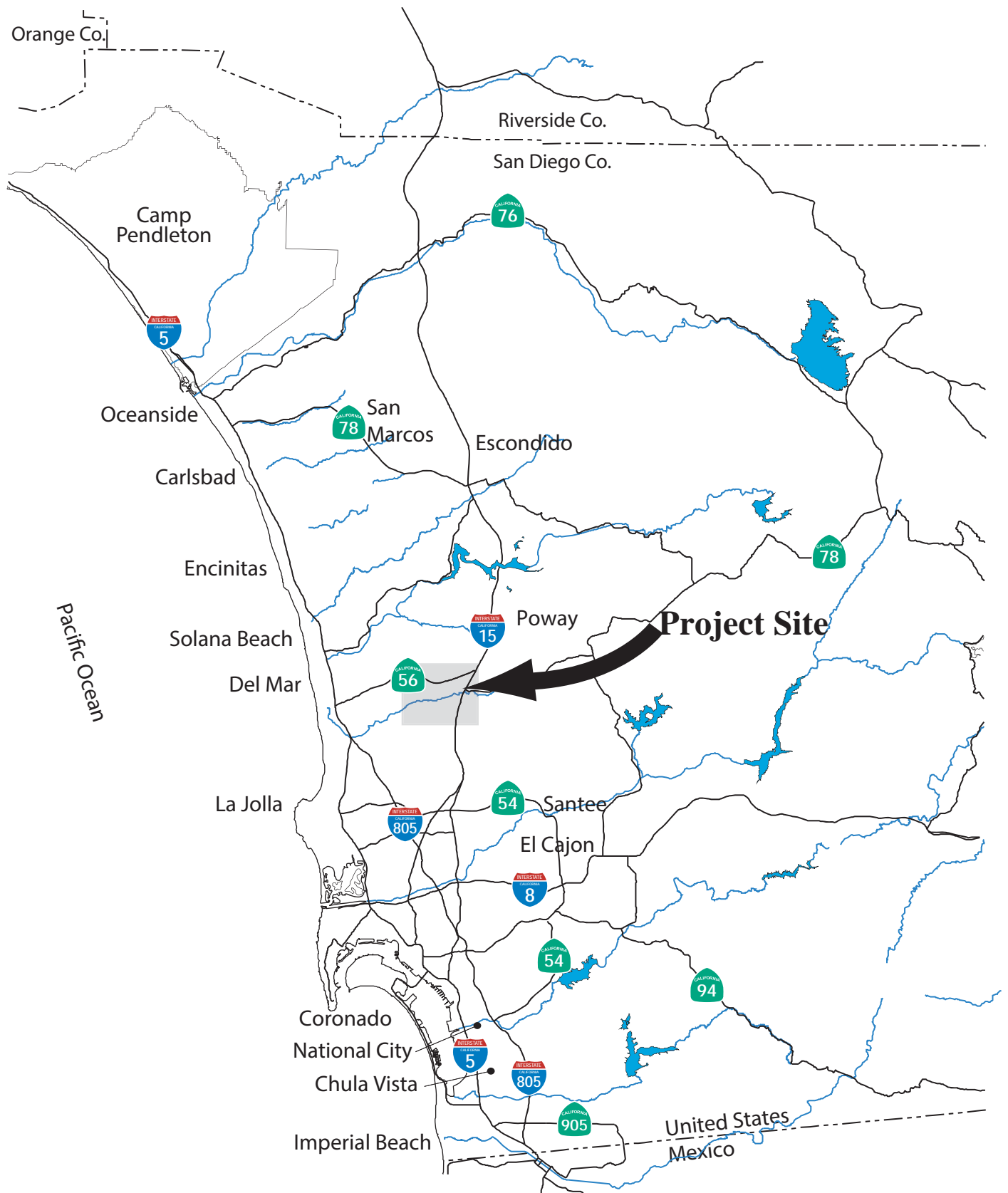
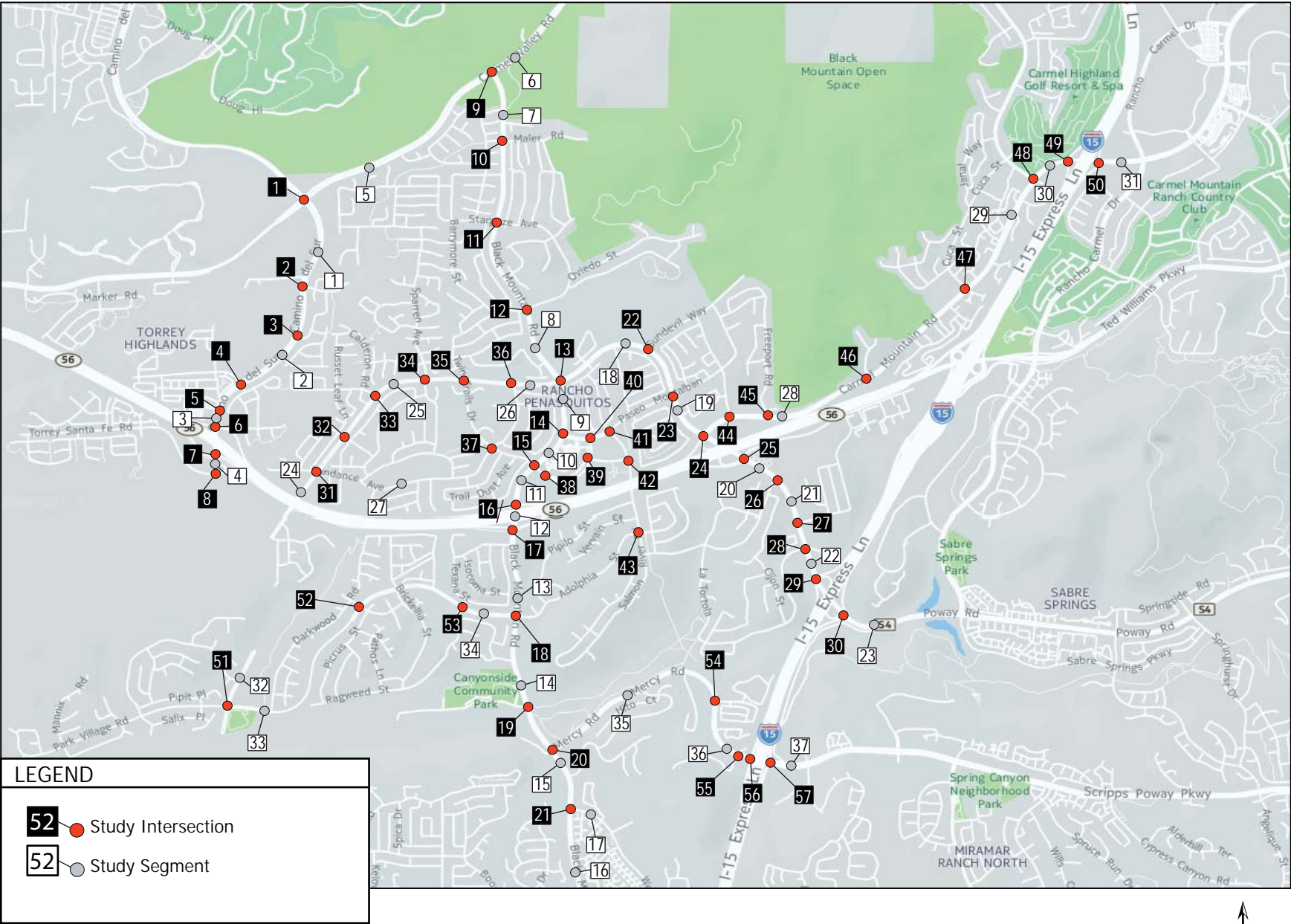


Figure 1-1
Project Vicinity Map



CHAPTER 2 METHODOLOGIES

This chapter describes the methodologies and assumptions used to conduct the transportation impact study for the Project. The study methodology and analysis were consistent with the *City of San Diego Traffic Impact Study Manual (1998)* and *City of San Diego Significance Determination Thresholds, Development Services Department (2011)*. These guidelines were used to determine the potential significant impacts of the Project, based on the following considerations:

- Study scenarios and time periods
- Capacity analysis methodologies

STUDY SCENARIOS AND TIME PERIODS

The following scenarios were analyzed for the AM peak hour, PM peak hour and daily time periods in the study:

- Existing (2014) Conditions
- Horizon Year (2050) Conditions Without Project (BMR Segment 6-Lane Primary Arterial)
- Horizon Year (2050) Conditions With Project (BMR Segment 4-Lane Major)

A full list of the network changes that occur and were studied in both Horizon Year scenarios is expanded on in Chapter 4 in Table 4.2.

CAPACITY ANALYSIS METHODOLOGIES

Roadway operating conditions are typically described in terms of “level of service.” Level of service is a “report card” type scale used to indicate the quality of traffic flow on roadway segments and at intersections under prevailing conditions. Level of service (LOS) ranges from LOS A (free flow, little congestion) to LOS F (forced flow, extreme congestion). A more detailed description of the LOS concepts, along with the analysis methodologies and standards of significance discussed below, are provided in Appendix A.

Roadway Segment Capacity Analysis

The City of San Diego has published daily traffic volumes standards for roadways within its jurisdiction. To determine service levels on study area roadway segments, the appropriate average daily traffic thresholds for level of service were compared to the daily capacity of the roadway segments, relative to the existing and future volumes in the study area. The thresholds for determining level of service used in this analysis are summarized in Appendix A.

Intersection Capacity Analysis

The analysis of peak-hour intersection performance was conducted using Synchro, a traffic analysis and signal optimization software application. Synchro supports the Highway Capacity Manual (HCM) methodology for signalized and unsignalized intersections. Appendix A contains the HCM delay and level of service criteria for signalized and unsignalized intersections.

Signalized Intersections

The HCM methodology for analyzing signalized intersections is based on the “operational analysis” procedure. This procedure uses 1,900 passenger cars per hour of green per lane as the maximum saturation flow of a single lane at a signalized intersection. This saturation flow rate is adjusted to account for lane width, on-street parking, conflicting pedestrian flow, traffic composition (e.g., percentage of vehicles that are trucks), and shared lane movements (e.g., through and right-turn

movements from the same lane). Average control delay is calculated using a volume-weighted average of all of the delays for all vehicles entering the intersection.

All-Way Stop-Controlled Intersections

The HCM methodology for analyzing all-way stop-controlled intersections is based on conflicting traffic for vehicles stopped at an intersection. These intersections operate in either two-phase or four-phase patterns, and flows are determined by a consensus of right-of-way that alternates between north-south and east-west movements. Average control delay is calculated using a volume-weighted average of all of the delays for all vehicles entering the intersection.

Two-Way Stop-Controlled Intersections

The HCM methodology for analyzing two-way stop-controlled intersections is based on gap acceptance and conflicting traffic for vehicles stopped on the minor street approaches. The critical gap (or minimum gap that would be acceptable) is defined as the minimum time interval in the major street traffic flow that allows one vehicle from the minor street to enter the intersection. Control delay and level of service for the “worst” approach are reported, rather than for the intersection as a whole.

Freeway Mainline Analysis

The method for calculating freeway level of service is based on the volume-to-capacity (V/C) ratio using the following equation:

$$V/C = \frac{[(ADT * \text{Peak hour percent} * \text{Directional factor}) / \text{Truck factor}]}{\text{Capacity}}$$

where:

ADT = average daily traffic volume (2-way);

Peak hour percent = the proportion of ADT that occurs during the peak hour (not specifically AM or PM);

Directional factor = the proportion of peak hour traffic traveling in the peak direction;

Truck factor = a reduction in capacity to account for heavy vehicles and grades; and

Capacity = 2,300 vehicles per hour per lane.

The resultant v/c ratios are compared to the standard v/c thresholds for level of service contained in Appendix A. The freeway mainline ADT, directional factors, peak hour factors, and truck factors used in these analyses are found in Appendix I.

Metered Freeway On-Ramp Conditions

Freeway ramp meters are designed to maximize mainline freeway capacity, reduce traffic congestion and reduce peak period delays. This is accomplished by regulating the flow of vehicles entering the freeway, allowing for traffic flow on the mainline to achieve reasonable speeds. If excess demand exists at freeway on-ramps, delays and considerable queue lengths could result on ramps and adjacent surface roadways. All freeway ramp meters were analyzed based on the most restrictive ramp metering rates provided by Caltrans. Additionally, max observed queue lengths and max observed delay were recorded for the existing conditions. Appendix I contains the ramp meter rates obtained from Caltrans as well as the field notes for observed queueing and flow rates.

Analysis of Significance

To determine direct project impacts, the City of San Diego has developed a series of thresholds based on allowable increases in volume-to-capacity (V/C) ratios that become more stringent as service levels worsen. These thresholds are summarized in Appendix A. Where roadway segments and intersections operate at LOS A, B, C or D, no project impacts are considered significant.

CHAPTER 3 EXISTING CONDITIONS

Existing conditions represent the current conditions of the study area. Under existing conditions, the subject segment along Black Mountain Road functions as a 4-Lane Major.

TRAFFIC VOLUMES

Daily traffic volumes along roadway segments were obtained through machine data collection. Intersection turning movement counts were conducted during the weekday morning peak period from 7:00 AM to 9:00 AM and evening peak period from 4:00 PM to 6:00 PM. The dates on which the segment and intersection counts were conducted range during the period of October, 2013 to July, 2014 on non-holiday weekdays, specifically Tuesday through Thursday. Figures 3-2, 3-3, 3-4 and 3-5 show existing condition volumes. Appendix B contains the individual roadway segment and intersection count sheets.

ROADWAY NETWORK

The principal roadways in the project study area are described briefly below. The description includes the physical characteristics, adjacent land uses, and traffic control devices along these roadways as well as discussion of the Rancho Peñasquitos Community Plan. A map of the ultimate street classifications upon build-out of the community can be found in Appendix D. The existing roadway geometry and control conditions are shown in Figures 3-1 and 3-2.

Primary regional access to the study area is provided via two freeways, Interstate 15 (Escondido Freeway), a north-south facility, and State Route 56 (Ted Williams Freeway), an east-west facility. State Route 56 merges with Interstate 15 to the east of the study area. Interstate 15 provides access to the greater San Diego area to the south and the City of Escondido to the north.

Interstate 15 (I-15) is a north-south highway extending southward from the State of Montana to the State of California. Within the vicinity of the study area, I-15 has five through lanes per direction, 2 managed lanes in each direction, an auxiliary lane in each direction between each on/off ramp, and on/off-ramps at Mercy Road-Scripps Poway Parkway, Rancho Peñasquitos Boulevard-Poway Road and Carmel Mountain Road.

State Route 56 (SR-56) is an east-west highway running between Interstate 5, near the Pacific Ocean, and I-15, in the Rancho Peñasquitos Community. Within the vicinity of the study area, SR-56 has two through lanes per direction with an additional intermittent auxiliary/transition lane in each direction and on/off-ramps at Camino Del Sur, Black Mountain Road and Rancho Peñasquitos Boulevard.

The following streets provide freeway access and circulation to local destinations.

Camino Del Sur is functionally classified as a 4-Lane Prime Arterial running primarily north-south from Rancho Bernardo Road in the north becoming Camino del Norte to Torrey Santa Fe Road. Camino Del Sur is then broken off by a canyon and continues to the south from Dormouse Road to just past Park Village Road. An extension of Camino Del Sur is planned to be constructed by the Merge 56 project and will connect the two segments between Torrey Santa Fe Road and Dormouse Road. It is striped with two through lanes in each direction, separated by a raised median, and left-turn channelization. The curb-to-curb width varies throughout the segment with a common measurement of 110 feet. Sidewalks and bike lanes are present and on-street parking is restricted. The posted speed limit is generally 45 MPH within the study area. From the SR-56 westbound ramps north to Carmel Valley Road, Camino Del Sur has an ultimate community plan classification of a 6-Lane Major Arterial. The Merge 56 project, a proposed development in the Rancho

Penasquitos area is currently proposing to downgrade the ultimate classification of Camino del Sur to a 2 lane facility between a portion of its frontage and the existing terminus near Dormouse Road.

Black Mountain Road is functionally classified as a 4-Lane Prime Arterial within the study area and extends southward from Carmel Valley Road to its terminus at Carroll Centre Road, where it continues as Kearny Villa Road. Within the study area, Black Mountain Road is generally striped with two through lanes per direction, separated by a raised median, and left-turn channelization. The roadway has sidewalks, bike lanes and a curb-to-curb width that varies throughout the segment with a common measurement of 90 feet. On-street parking is restricted. Within the study area, the speed limit is generally 45 MPH, with the exception of the segment between Twin Trails Drive and Oviedo Street, where it is 40 MPH. South of Mercy Road, the speed limit increases to 50 MPH. The roadway serves both residential and commercial uses. Black Mountain Road is built to its ultimate community plan classification of a 4-Lane Primary Arterial, with the exception of the segment from Twin Trails Drive to Mercy Road. The Rancho Peñasquitos Community Plan identifies this segment to become a 6-Lane Primary Arterial. This study analyzes the implications of this segment being maintained as four lanes instead of being widened to six lanes.

Carmel Mountain Road is functionally classified as a 4-Lane Major Arterial within the study area. It is generally an east-west roadway that extends from Via Panacea to Camino Del Norte, where it continues as Paseo Lucido. It is generally striped with two through lanes in each direction, with the exception of the segment from Paseo Montalban to Azuaga Street/SR-56 northbound ramps, which is striped with three eastbound lanes and two westbound lanes. A raised center median is generally present, along with left-turn channelization. The curb-to-curb width varies throughout the segment with a common measurement of 80 feet and the speed limit is generally 40 MPH. Sidewalks are present and the roadway is striped with bike lanes along most of its segments. On-street parking is restricted. Carmel Mountain Road south of Sundance Avenue to Via Panacea currently functions as a 2-Lane Collector with a 35 foot curb-to-curb width. Carmel Mountain Road is built to its ultimate community plan classification of a 4-Lane Major Arterial except for south of Sundance Avenue. An extension of Carmel Mountain Road is planned to be constructed by the Merge 56 project, and will extend from Via Panacea to the extended section of Camino Del Sur described above. The Merge 56 development project also looks to downgrade the ultimate classification of this extension portion from Sundance Avenue to extended section of Camino del Sur to a 2-Lane Collector.

Rancho Peñasquitos Boulevard, is functionally classified as a 4-Lane Major Arterial, generally spans an area between SR-56 and I-15. It begins at Carmel Mountain Road, where it bends eastward at the SR-56 southbound ramps, and terminates at I-15, where it continues as Poway Road. Sidewalks are present, bike lanes are absent, and the roadway is striped with two lanes per direction, separated by a raised median and left-turn channelization. The curb-to-curb width varies throughout the segment with a common measurement of 80 feet and the posted speed is 40 MPH. Rancho Peñasquitos Boulevard is built to its ultimate community plan classification of a 4-Lane Major Arterial.

Mercy Road is functionally classified as a 4-Lane Major Arterial from Black Mountain Road to the I-15 freeway ramps, where it continues as Scripps Poway Parkway. It is striped with two lanes per direction and divided by a raised median. The roadway provides sidewalks, bike lanes and left-turn channelization and prohibits on-street parking. The curb-to-curb width varies throughout the segment with a common measurement of 75 feet and the posted speed limit is 45 MPH traveling eastbound and 50 MPH traveling westbound. Mercy Road is built to its ultimate community plan classification of a 4-Lane Major Arterial.

Carmel Valley Road is functionally classified as a four lane Major Arterial from SR-56 to Chadamy Way and striped with one lane in each direction from Chadamy Way to Black Mountain Road. Carmel Valley Road runs primarily east/west within the northern half of Torrey Highlands, and extends all the way east to Camino del Norte. The roadway provides sidewalks and a raised median from SR-56 to Chadamy Way and provides bike lanes, left turn channelization and prohibits on-street parking throughout the study area. The curb-to-curb width varies throughout the segment with a common measurement of 100 feet and a posted speed limit of 55 mph. Carmel Valley Road's

ultimate classification is a 4-Lane Major Arterial with additional right-of-way for transit dedicated lanes.

A summary of other study area streets is provided in Table 3-1. Tables 3-2 and 3-3 present the operational performance of the roadway segments and intersections for the existing conditions. Additional details regarding specific existing peak-hour intersection operating conditions can be found on the analysis worksheets in Appendix C. Additionally, Appendix C denotes which intersections were run in analysis as coordinated system. These coordinated systems continue to run as coordinated in all future scenarios as well.

ROADWAY CAPACITY LOS

A detailed roadway capacity analysis was conducted per the methodology discussed in Chapter 2 for the Existing Conditions scenario. These results are found in Table 3-2.

INTERSECTION CAPACITY LOS

A detailed intersection capacity analysis was conducted per the methodology discussed in Chapter 2 for the Existing Conditions scenario. These are found in Table 3-3.

FREEWAY MAINLINE LOS

A detailed freeway mainline analysis was conducted to determine the study area freeway mainline LOS under existing conditions. Existing count volumes were provided by Caltrans for the year 2013. A summary of existing freeway mainline LOS is presented in Table 3-4. As shown in Table 3-4, two of the four study segments along SR-56 are operating at LOS E during the AM and/or PM peak hours. Study segments along I-15 are operating at LOS C or better during the peak hours. The detailed LOS analysis worksheet, including adjustment factors, is included in Appendix I.

FREEWAY INTERCHANGE ON-RAMP METERING DELAY

An on-ramp metering delay analysis was conducted for existing conditions. A summary of the analysis results is provided in Table 3-5. The ramp metering rates were obtained from Caltrans and are included in Appendix I and existing metering delay is shown in Table 3-6.

In addition, an Intersection Lane Vehicles (ILV) analysis of existing conditions was performed for controlled interchanges. The calculation worksheets are contained in Appendix N.

**Table 3-1
Other Study Area Streets Summary**

Roadway Name	Functional Classification	Lanes Per Direction	Curb-to-Curb Width	Posted Speed Limit	Raised Median	TWLT	Left-Turn Channel.	Sidewalks	Bike Lanes
Sundance Avenue	Local	1	40 ft	25 mph				✓	
Twin Trails Drive (W-O Black Mtn Rd)	2-Lane Collector ¹	1	60 ft	30 mph		✓	✓	✓	✓
Twin Trails Drive (E-O Black Mtn Rd)	2-Lane Collector	1	50 ft	25-35 mph		✓	✓	✓	
Paseo Montalban (W-O Carmel Mtn Rd)	4-Lane Major	2	80 ft	40 mph	✓		✓	✓	✓
Fairgrove Lane	Local	1	40 ft	25 mph				✓	
Salmon River Road	Local	1	40-50 ft	30 mph		✓	✓	✓	
Park Village Road	4-Lane Major	2	80 ft	45 mph	✓		✓	✓	✓
Westview Parkway	4-Lane Collector	2	70 ft	45 mph		✓	✓	✓	

1. Community Plan recommended classification is 4-Lane Collector.

**Table 3-2
Existing Roadway Segment Conditions**

Segment Number and Name	Lanes/ Class	LOS E (Capacity)	Existing ADT	V/C	LOS
1. Camino Del Sur s/o Carmel valley Road	4PA	40,000	17,728	0.443	B
2. Camino Del Sur s/o Wolverine Way - Fallhaven Road	4PA	40,000	20,710	0.518	B
3. Camino Del Sur n/o SR-56 Westbound Ramps	4PA	40,000	25,921	0.648	C
4. Camino Del Sur s/o SR-56 Eastbound Ramps	4MA	40,000	9,818	0.245	A
5. Carmel Valley Road w/o Black Mountain Road	2C NF	10,000	10,489	1.049	F
6. Carmel Valley Road e/o Black Mountain Road	4MA	40,000	13,793	0.345	A
7. Black Mountain Road n/o Maler Road	4MA	40,000	12,303	0.308	A
8. Black Mountain Road s/o Oviedo Street	4MA	40,000	18,956	0.474	B
9. Black Mountain Road s/o Carmel Mountain Road	4MA	40,000	14,740	0.369	A
10. Black Mountain Road bet. Paseo Montalban & Twin Trails Drive	4MA	40,000	14,315	0.358	A
11. Black Mountain Road s/o Twin Trails Drive	4MA	40,000	33,492	0.837	D
12. Black Mountain Road bet. SR-56 Westbound & Eastbound Ramps	4MA	40,000	30,567	0.764	D
13. Black Mountain Road n/o Park Village Road - Adolphia Street	4MA	40,000	35,443	0.886	E
14. Black Mountain Road n/o Canyonside Park Drive	4MA	40,000	30,380	0.760	D
15. Black Mountain Road bet. Mercy Road & Babuta Road	6PA	60,000	28,862	0.481	B
16. Black Mountain Road s/o Westview Parkway	6PA	60,000	22,214	0.370	A
17. Westview Parkway e/o Black Mountain Road	4C	30,000	6,099	0.203	A
18. Carmel Mountain Road bet. Paseo Aldabra & Sundevil Way	4MA	40,000	14,152	0.354	A
19. Carmel Mountain Road bet. Paseo Montalban & SR-56 Westbound Ramps	4MA	40,000	21,907	0.548	C
20. Rancho Penasquitos Blvd bet. SR-56 EB Ramps - Azuaga St & Calle De Las Rosas	4MA	40,000	27,441	0.686	C
21. Rancho Penasquitos Boulevard bet. Calle De Las Rosas & Via Del Sud	4MA	40,000	28,120	0.703	C
22. Rancho Penasquitos Boulevard bet. Paseo Montrail & I-15 Southbound Ramps	4MA	40,000	33,066	0.827	D
23. Poway Road e/o I-15 Northbound Ramps	6PA	60,000	45,045	0.751	C
24. Carmel Mountain Road s/o Sundance Avenue	2C NF	10,000	1,241	0.124	A
25. Carmel Mountain Road w/o Sparren Avenue	4MA	40,000	6,811	0.170	A
26. Carmel Mountain Road w/o Black Mountain Road	4MA	40,000	8,316	0.208	A
27. Sundance Avenue w/o War Bonnet Street*	-	-	1,884	-	-
28. Carmel Mountain Road e/o Freeport Road	4MA	40,000	11,328	0.283	A
29. Carmel Mountain Road bet. Penasquitos Drive & Gerana Street	4MA	40,000	13,655	0.341	A
30. Carmel Mountain Road bet. I-15 Southbound Ramps & Penasquitos Drive	4MA	40,000	25,071	0.627	C
31. Carmel Mountain Road e/o I-15 Northbound Ramps	6PA	60,000	44,953	0.749	C
32. Camino Del Sur n/o Park Village Road	4MA	40,000	1,185	0.030	A
33. Park Village Road e/o Camino Del Sur	4MA	40,000	8,430	0.211	A
34. Park Village Road w/o Black Mountain Road	4MA	40,000	17,546	0.439	B
35. Mercy Road bet. Chabola Road & Branicole Ln	4MA	40,000	14,279	0.357	A
36. Mercy Road n/o Alemania Road	4MA	40,000	19,851	0.496	B
37. Scripps Poway Parkway e/o I-15 Northbound Ramps	6PA	60,000	52,815	0.880	D

* Capacity for local residential street not specified in *San Diego Street Design Manual, July 2002*.

Abbreviations: 2C NF: 2 lane collector with no fronting property. 2MA: 2 lane Major Arterial. 4C: 4 lane Collector. 4MA: 4 lane Major Arterial.

4PA: 4 lane Prime Arterial. 6PA: 6 lane Prime Arterial.

Table 3-3
Existing Intersection Conditions

Intersection Number and Name	2014 Existing			
	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
1. Camino Del Sur/Carmel Valley Road	41.1	D	33.3	C
2. Camino Del Sur/Watson Ranch Road	10.3	B	9.4	A
3. Camino Del Sur/Wolverine Way - Fallhaven Road	25.3	C	17.9	B
4. Camino Del Sur/Torrey Meadows Drive	18.1	B	21.0	C
5. Camino Del Sur/Highlands Village Place	19.3	B	13.2	B
6. Camino Del Sur/SR-56 Westbound Ramps	15.6	B	16.3	B
7. Camino Del Sur/SR-56 Eastbound Ramps	15.9	B	23.4	C
8. Camino Del Sur/Torrey Santa Fe Road	13.8	B	15.8	B
9. Black Mountain Road/Carmel Valley Road	23.3	C	50.2	D
10. Black Mount Road/Maler Road	7.6	A	7.5	A
11. Black Mountain Road/Stargaze Avenue	15.7	B	15.4	B
12. Black Mountain Road/Oviedo Street	16.8	B	16.0	B
13. Black Mountain Road/Carmel Mountain Road	47.4	D	36.5	D
14. Black Mountain Road/Paseo Montalban	13.4	B	13.4	B
15. Black Mountain Road/Twin Trails Drive	43.2	D	38.8	D
16. Black Mountain Road/SR-56 Westbound Ramps	37.9	D	29.6	C
17. Black Mountain Road/SR-56 Eastbound Ramps	22.0	C	23.9	C
18. Black Mountain Road/Park Village Road - Adolphia Street	46.3	D	26.1	C
19. Black Mountain Road/Canyonside Park Drive	2.3	A	4.8	A
20. Black Mountain Road/Mercy Road	29.8	C	25.3	C
21. Black Mountain Road/Westview Parkway	13.4	B	16.1	B
22. Carmel Mountain Road/Sundevil Way	20.2	C	16.8	B
23. Carmel Mountain Road/Paseo Montalban	24.6	C	33.4	C
24. Carmel Mountain Road/SR-56 WB Ramps - Rancho Penasquitos Boulevard	41.9	D	34.3	C
25. Rancho Penasquitos Boulevard/SR-56 Eastbound Ramps - Azuaga Street	20.6	C	51.3	D
26. Rancho Penasquitos Boulevard/Calle De Las Rosas	10.1	B	10.0	A
27. Rancho Penasquitos Boulevard/Via Del Sud	4.5	A	4.3	A
28. Rancho Penasquitos Boulevard/Paseo Montrail	13.5	B	14.6	B
29. Rancho Penasquitos Boulevard/I-15 Southbound Off-Ramp	7.9	A	9.4	A
30. Rancho Penasquitos Boulevard/I-15 Northbound Off-Ramp	10.9	B	14.9	B
31. Carmel Mountain Road/(West) Sundance Avenue	13.8	B	16.1	B
32. Carmel Mountain Road/Sedorus Street (All-way stop control)	7.5	A	7.4	A
33. Carmel Mountain Road/Entreken Way	21.3	C	13.4	B
34. Sparren Avenue/Carmel Mountain Road	24.1	C	24.0	C
35. Oviedo Street/Carmel Mountain Road	28.8	C	16.7	B
36. (East) Sundance Avenue/Carmel Mountain Road (Two-way stop control)*	18.4	C	9.9	A
37. Sundance Avenue/Twin Trails Drive (All-way stop control)	22.7	C	14.9	B
38. Penasquitos Post Office Driveway/Twin Trails Drive	18.2	B	26.7	C
39. Twin Trails Drive/Fairgrove Lane (All-way stop control)	8.0	A	9.0	A
40. Twin Trails Drive/Paseo Montalban	11.0	B	12.9	B
41. Salmon River Road/Paseo Montalban	13.6	B	15.1	B
42. Salmon River Road/Fairgrove Lane (All-way stop control)	8.0	A	8.8	A
43. Salmon River Road/Adolphia Street - Limar Way (All-way stop control)	7.5	A	7.9	A
44. Paseo Cardiel/Carmel Mountain Road	23.1	C	29.1	C
45. Freeport Road/Carmel Mountain Road	8.8	A	7.8	A
46. Stoney Creek Road/Carmel Mountain Road	10.5	B	3.6	A
47. Cuca Street - Caminata Deluz/Carmel Mountain Road	14.0	B	10.9	B
48. Penasquitos Drive/Carmel Mountain Road	28.9	C	28.1	C
49. I-15 Southbound Ramps/Carmel Mountain Road	18.2	B	25.3	C
50. I-15 Northbound Ramps/Carmel Mountain Road	21.9	C	27.3	C
51. Camino Del Sur/Park Village Road	24.5	C	19.3	B
52. Rumex Lane/Park Village Road	7.9	A	7.1	A
53. Ragweed Street/Park Village Road	15.9	B	16.1	B
54. Mercy Road/Kika Court	8.0	A	7.4	A
55. Alemania Road/Mercy Road	9.4	A	10.3	B
56. I-15 Southbound Ramps/Mercy Road	31.0	C	33.0	C
57. I-15 Northbound Ramps/Mercy Road - Scripps Poway Parkway	39.0	D	34.8	C
Signal Timing and Phasing Source - City of San Diego Timing Sheets - See Appendix B				
* Worst case control delay and LOS shown.				

**Table 3-4
Existing Freeway Mainline LOS**

Freeway Segment	Direction	# of Lanes	Hourly Capacity	ADT	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM	AM	PM
SR-56										
West of Camino del Sur	WB	2 Mainline, 0 Auxiliary, 0 HOV	4700	65,000	4238	1559	0.902	0.332	D	A
	EB	2 Mainline, 0 Auxiliary, 0 HOV	4700		1625	4161	0.346	0.885	A	D
Camino del Sur to Black Mountain Rd	WB	2 Mainline, 0 Auxiliary, 0 HOV	4700	72,000	4695	1727	0.999	0.367	E	A
	EB	2 Mainline, 0 Auxiliary, 0 HOV	4700		1800	4609	0.383	0.981	A	E
Black Mountain Road to Rancho Penasquitos Blvd	WB	2 Mainline, 1 Auxiliary, 0 HOV	6500	76,000	4956	1823	0.762	0.280	C	A
	EB	3 Mainline, 0 Auxiliary, 0 HOV	7050		1900	4865	0.270	0.690	A	C
Rancho Penasquitos Blvd to I-15 Interchange	WB	2 Mainline, 0 Auxiliary, 0 HOV	4700	71,000	4630	1703	0.985	0.362	E	A
	EB	2 Mainline, 0 Auxiliary, 0 HOV	4700		1775	4545	0.378	0.967	A	E
I-15										
South of Mercy Road	NB	5 Mainline, 1 Auxiliary, 2 HOV	16910	249,000	12258	9034	0.725	0.534	C	B
	SB	5 Mainline, 1 Auxiliary, 2 HOV	16910		8997	12113	0.532	0.716	B	C
Mercy Road to Rancho Penasquitos Blvd	NB	5 Mainline, 1 Auxiliary, 2 HOV	16910	236,000	11618	8563	0.687	0.506	C	B
	SB	5 Mainline, 1 Auxiliary, 2 HOV	16910		8527	11481	0.504	0.679	B	C
Rancho Penasquitos Blvd to Ted Williams Pkwy	NB	5 Mainline, 0 Auxiliary, 2 HOV	15110	207,000	10190	7510	0.674	0.497	C	B
	SB	5 Mainline, 1 Auxiliary, 2 HOV	16910		7480	10070	0.442	0.596	B	B
Ted Williams Pkwy to Carmel Mountain Rd	NB	5 Mainline, 1 Auxiliary, 2 HOV	16910	229,000	11273	8309	0.667	0.491	C	B
	SB	5 Mainline, 1 Auxiliary, 2 HOV	16910		8274	11140	0.489	0.659	B	C
North of Carmel Mountain Rd	NB	5 Mainline, 1 Auxiliary, 2 HOV	16910	218,000	11694	7142	0.692	0.422	C	B
	SB	5 Mainline, 0 Auxiliary, 2 HOV	15110		5108	11678	0.338	0.773	A	C

Peak Hour Volume = (ADT)(K)(D)/(Truck Factor))

V/C = Peak Hour Volume / Capacity

Truck Source: 2013 Annual Average Daily Truck Traffic on the California State Highway System

ADT Source: 2013 Traffic Volumes on the California State Highway System

K/D Source: 2013 K and D Factors on the California State Highway System

Hourly Capacity Assumptions:

Mainline - 2350 vph; Auxiliary - 1800 vph; Managed -1680 vph; HOV - 1600 vph

Table 3-5
Existing Freeway Interchange Calculated On-Ramp Metering Delay

Location	# of Lanes	Meter Rate (veh/hr/ lane)	Combined Meter Rate (veh/hr)	Without Connection			
				Demand (veh/hr)	Excess Demand (veh/hr)	Delay (min)	Queue (ft)
AM Peak Hour							
Camino del Sur - SR56 WB Ramp	2	435	870	462	0	0	0
Camino del Sur - SR56 WB Ramp (HOV)	1	435	435	51	0	0	0
Black Mountain Road - SR56 WB Ramp	2	520	1,040	1,341	301	17	8,729
Black Mountain Road - SR56 WB Ramp (HOV)	1	520	520	149	0	0	0
Rancho Penasquitos - SR56 WB Ramp	1	600	600	757	157	16	4,553
Carmel Mountain Road - I15 SB Ramp	2	367	734	773	39	3	1,134
Carmel Mountain Road - I15 SB Ramp (HOV)	1	367	367	86	0	0	0
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	2	492	984	1,470	486	30	14,094
Rancho Penasquitos - I15 SB Ramp - EB->SB	2	492	984	785	0	0	0
Mercy Road - I15 SB Ramp	2	420	840	1,089	249	18	7,221
Mercy Road - I15 SB Ramp (HOV)	1	420	420	121	0	0	0
PM Peak Hour							
Camino del Sur - SR56 EB Ramp	2	480	960	917	0	0	0
Camino del Sur - SR56 EB Ramp (HOV)	1	480	480	102	0	0	0
Black Mountain Road - SR56 EB Ramp	2	600	1,200	651	0	0	0
Black Mountain Road - SR56 EB Ramp (HOV)	1	600	600	72	0	0	0
Rancho Penasquitos - SR56 EB Ramp	2	300	600	194	0	0	0
Carmel Mountain Road - I15 SB Ramp	2	473	946	1,034	88	6	2,555
Carmel Mountain Road - I15 SB Ramp (HOV)	1	473	473	115	0	0	0
Carmel Mountain Road - I15 NB Ramp	2	463	926	723	0	0	0
Carmel Mountain Road - I15 NB Ramp (HOV)	1	463	463	80	0	0	0
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	2	576	1,152	849	0	0	0
Rancho Penasquitos - I15 SB Ramp - EB->SB	2	576	1,152	781	0	0	0
Rancho Penasquitos - I15 NB Ramp - WB->NB	1	335	335	430	95	17	2,755
Rancho Penasquitos - I15 NB Ramp - Loop EB->NB	1	335	335	130	0	0	0
Mercy Road - I15 SB Ramp	2	406	812	1,177	365	27	10,591
Mercy Road - I15 SB Ramp (HOV)	1	406	406	131	0	0	0
Mercy Road - I15 NB Ramp	2	270	540	950	410	46	11,902
Mercy Road - I15 NB Ramp (HOV)	1	270	270	106	0	0	0

Source: Caltrans January 2015

Meter rate is based on the most restrictive meter rate provided by Caltrans, see Appendix C

HOV demand is equal to 10% of Total Demand

Total Demand onto all lanes of each Freeway Ramp is found in the vehicle turning movements in Figures 3-4 and 3-5

Combined Meter Rate = (Meter Rate per Lane) * (# of Lanes)

Excess Demand = (Demand * # of lanes) - (Combined Meter Rate); if Excess Demand < 0, then Excess Demand = 0

Delay = Excess Demand / Combined Meter Rate

Queue = Excess Demand * 29 ft/vehicle

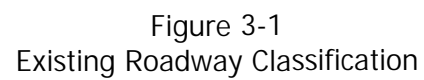
Table 3-6
Existing Freeway Interchange Observed On-Ramp Metering Delay

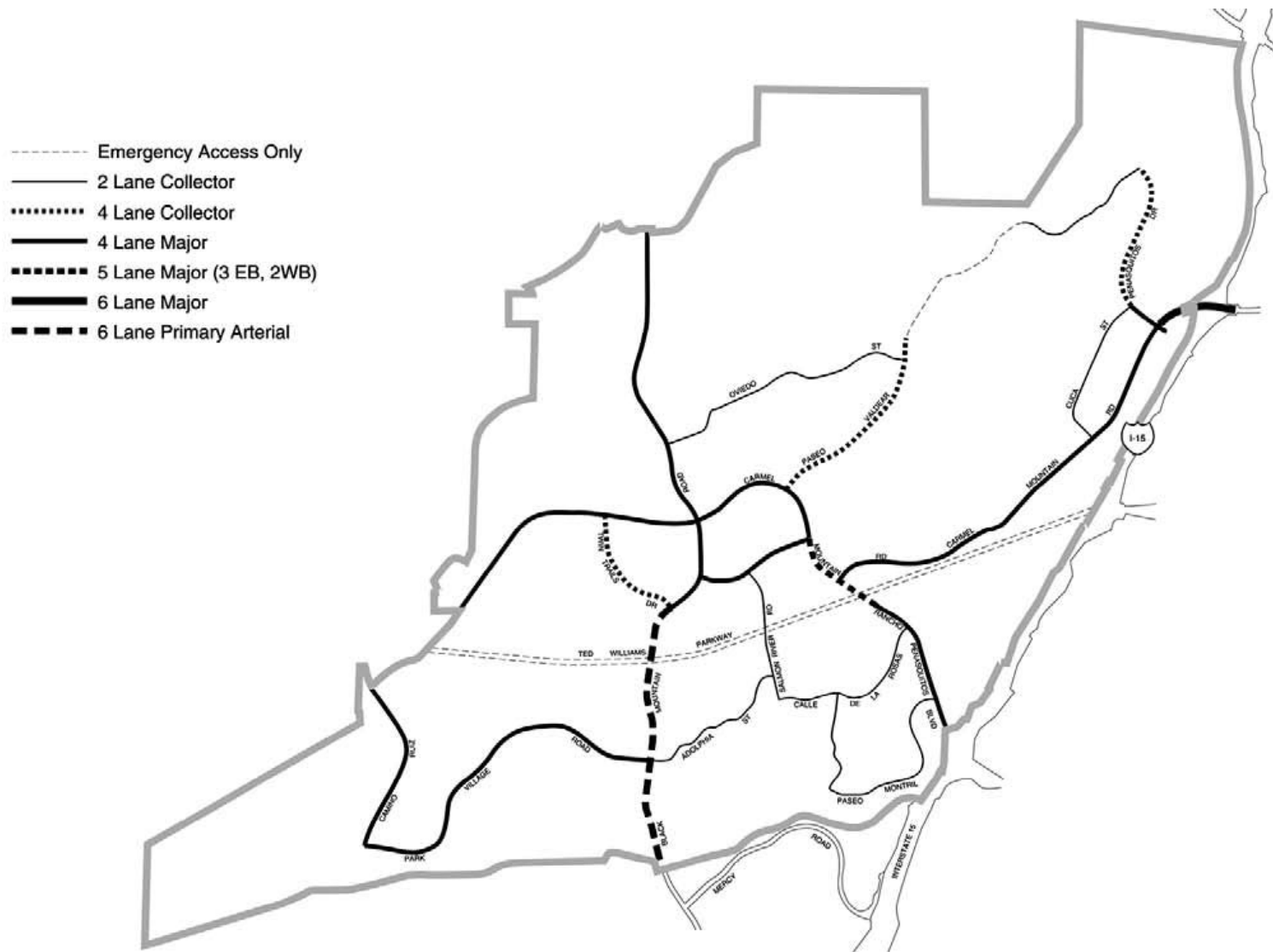
Ramp Location	Date	Time	# of lanes	Max Observed Queue (Veh / Ln)	Max Observed Delay (min)	Observed Queue Length (ft)	Calculated Flow Rate (veh / hr / lane)
AM Peak Hour							
Camino del Sur - SR56 WB Ramp	6/17/15	7:50 AM	2-SOV, 1-HOV	4	0.2	116.0	421
Black Mountain Road - SR56 WB Ramp	6/17/15	7:28 AM	2-SOV, 1-HOV	15	0.6	435.0	529
Rancho Penasquitos - SR56 WB Ramp	6/17/15	7:05 AM	1-SOV	8	0.5	232.0	900
Carmel Mountain Road - I15 SB Ramp	6/17/15	7:45 AM	2-SOV, 1-HOV	10	0.5	290.0	436
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	6/17/15	7:30 AM	2-SOV	25	1.9	725.0	391
Rancho Penasquitos - I15 SB Ramp - EB->SB	6/17/15	7:40 AM	2-SOV	12	0.7	348.0	514
Mercy Road - I15 SB Ramp	6/17/15	8:10 AM	2-SOV, 1-HOV	12	0.4	348.0	600
PM Peak Hour							
Camino del Sur - SR56 EB Ramp	6/17/15	5:00 PM	2-SOV, 1-HOV	8	0.2	232.0	736
Black Mountain Road - SR56 EB Ramp	6/17/15	4:48 PM	2-SOV, 1-HOV	4	0.1	116.0	736
Rancho Penasquitos - SR56 EB Ramp	6/17/15	4:53 PM	1-SOV	4	0.2	116.0	1,200
Carmel Mountain Road - I15 SB Ramp	6/17/15	5:00 PM	2-SOV, 1-HOV	8	0.4	232.0	436
Carmel Mountain Road - I15 NB Ramp	6/17/15	5:10 PM	2-SOV, 1-HOV	8	0.4	232.0	436
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	6/17/15	4:55 PM	2-SOV	9	0.3	261.0	948
Rancho Penasquitos - I15 SB Ramp - EB->SB	6/17/15	5:20 PM	2-SOV	4	0.3	116.0	818
Rancho Penasquitos - I15 NB Ramp - WB->NB	6/17/15	5:08 PM	1-SOV	13	1.9	377.0	419
Rancho Penasquitos - I15 NB Ramp - Loop EB->NB	6/17/15	5:33 PM	1-SOV	3	0.4	87.0	439
Mercy Road - I15 SB Ramp	6/17/15	5:44 PM	2-SOV, 1-HOV	13	1.2	377.0	218
Mercy Road - I15 NB Ramp	6/17/15	4:45 PM	2-SOV, 1-HOV	11	0.6	319.0	387

Meter Rate = Observed in Field, see Appendix I

SOV = Single Occupancy Vehicle Lane

HOV = High Occupancy Vehicle Lane





Recommended Street Classifications

28
FIGURE

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N
Not To Scale
April 2016

Figure 3-1b
Ultimate Street Classifications per Rancho Penasquitos Community Plan



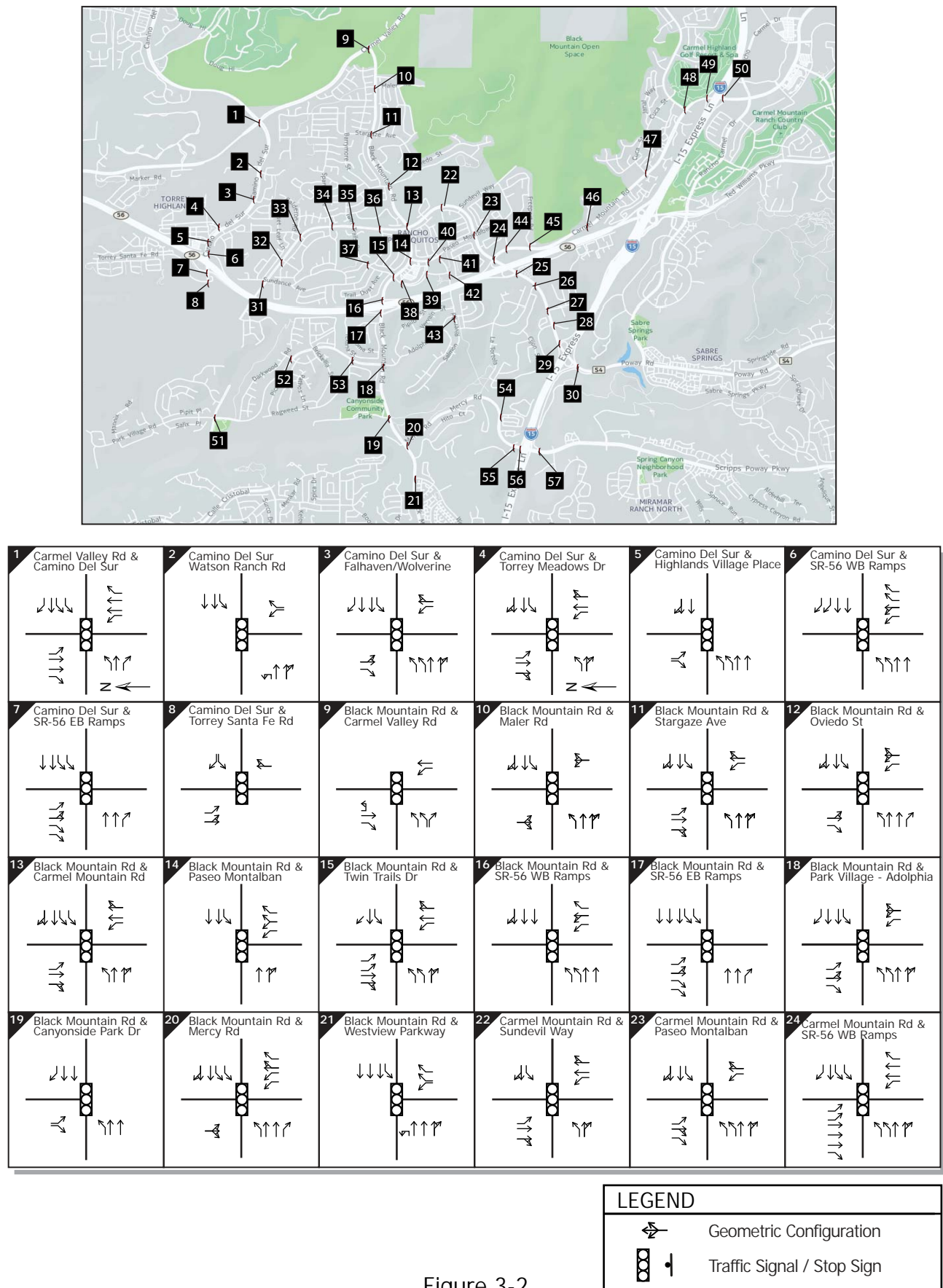
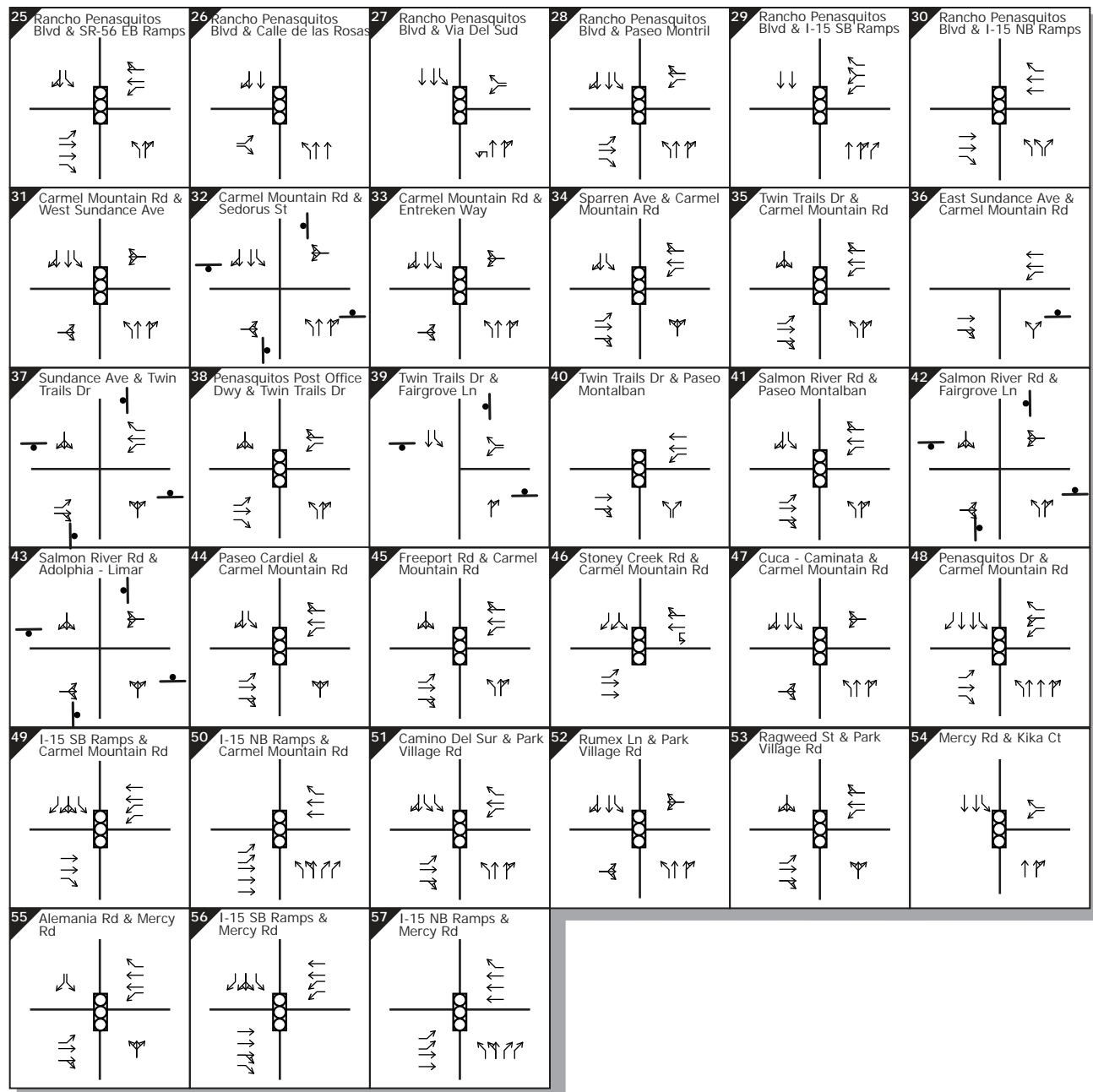


Figure 3-2
Existing Circulation Network



LEGEND



Geometric Configuration



Traffic Signal / Stop Sign

Figure 3-2 cont.
Existing Circulation Network

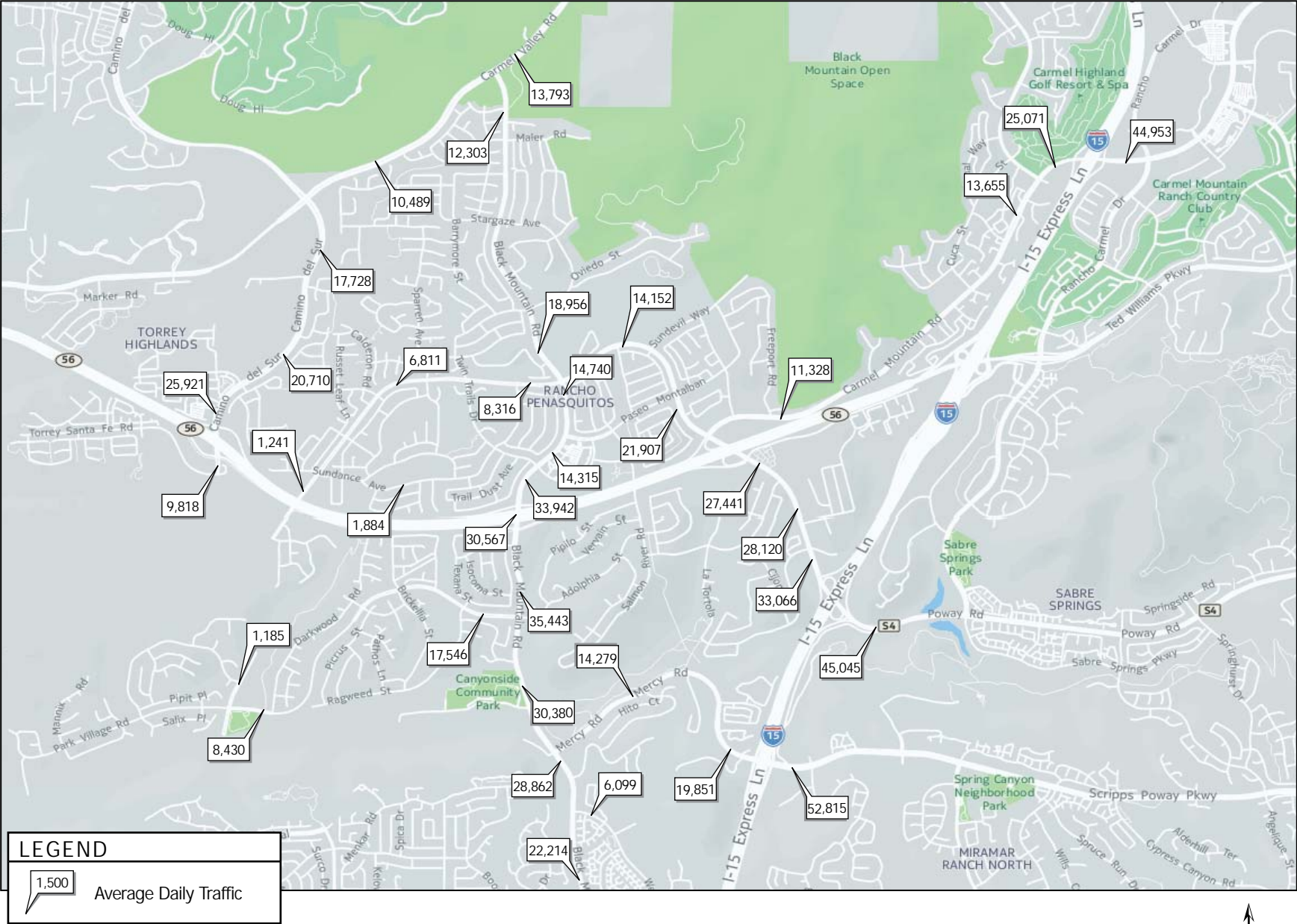
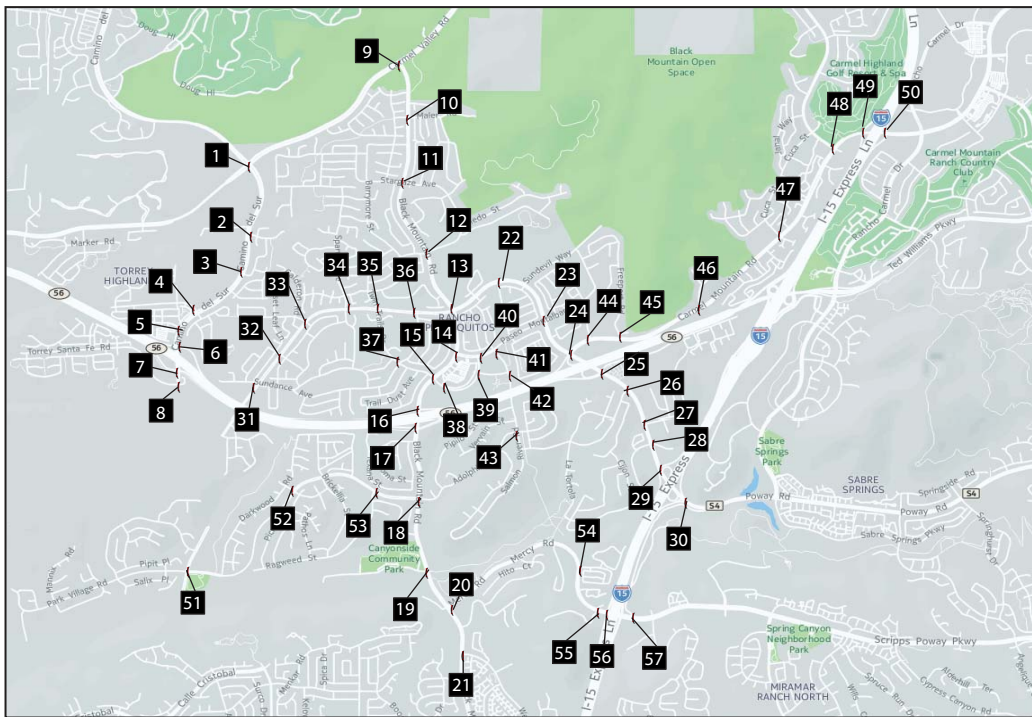


Figure 3-3
Existing Daily Roadway Segment Volumes

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Not To Scale
May 2016

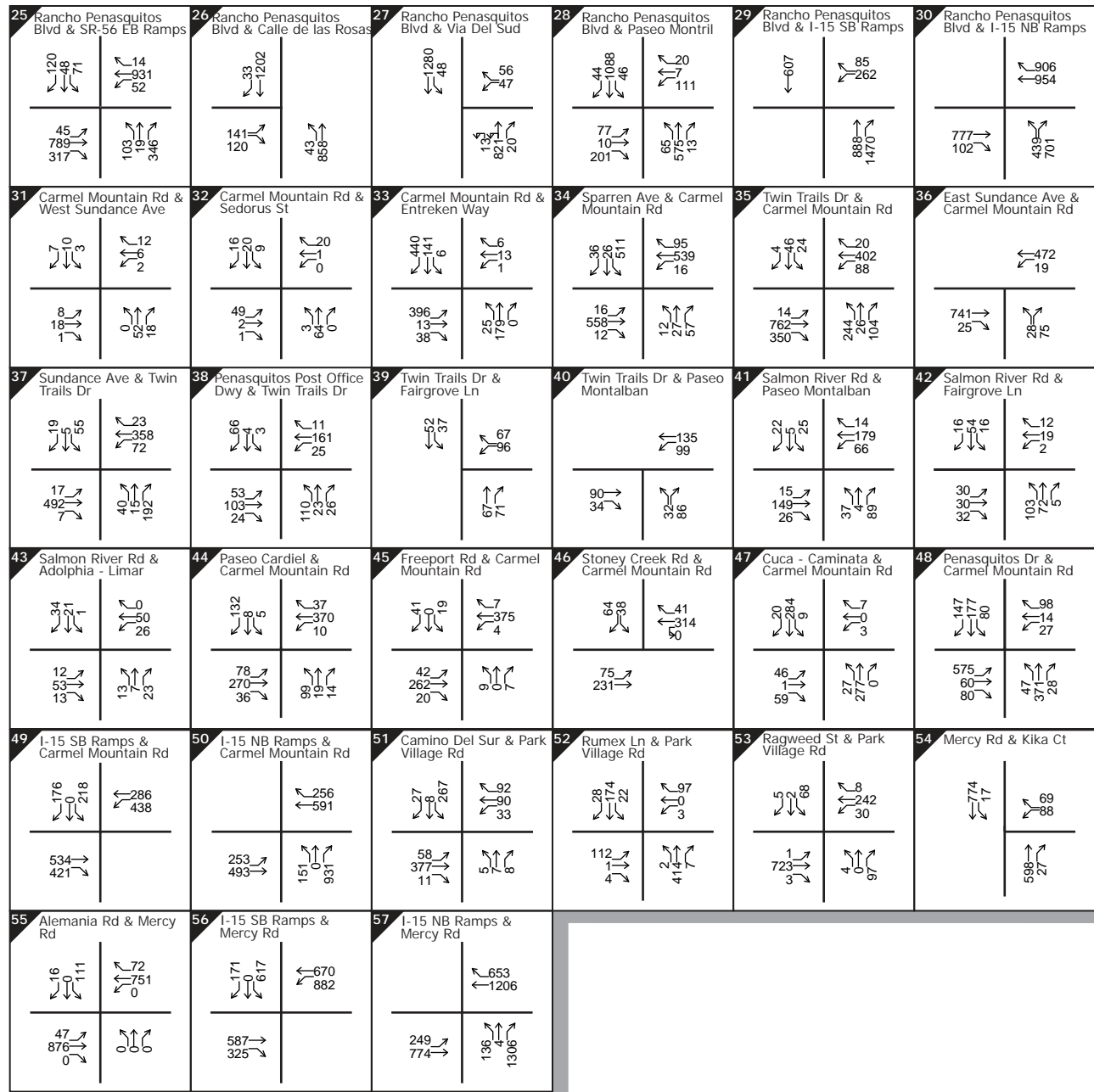


1 Carmel Valley Rd & Camino Del Sur <div> <div>186 466 176</div> <div>179 512 371</div> <div>111 177 81</div> <div>95 490 76</div> </div>	2 Camino Del Sur & Watson Ranch Rd <div> <div>865 27</div> <div>26 27</div> <div>102 642 8</div> </div>	3 Camino Del Sur & Falhaven/Wolverine <div> <div>18 701 48</div> <div>17 2 86</div> <div>12 0 45</div> <div>256 649 18</div> </div>	4 Camino Del Sur & Torrey Meadows Dr <div> <div>81 6 71</div> <div>18 799 30</div> <div>65 858 58</div> <div>89 2 29</div> </div>	5 Camino Del Sur & Highlands Village Place <div> <div>100 855</div> <div>100 220</div> <div>236 881</div> </div>	6 Camino Del Sur & SR-56 WB Ramps <div> <div>396 744</div> <div>829 9 367</div> <div>108 288</div> </div>
7 Camino Del Sur & SR-56 EB Ramps <div> <div>567 544</div> <div>121 184</div> <div>275 185</div> </div>	8 Camino Del Sur & Torrey Santa Fe Rd <div> <div>647 104</div> <div>199 13</div> <div>351 15</div> </div>	9 Black Mountain Rd & Carmel Valley Rd <div> <div>192 558</div> <div>210 77</div> <div>285 256</div> </div>	10 Black Mountain Rd & Maler Rd <div> <div>5 281 12</div> <div>40 21</div> <div>39 1</div> <div>4 455 12</div> </div>	11 Black Mountain Rd & Stargaze Ave <div> <div>16 287 7</div> <div>32 43</div> <div>81 109</div> <div>31 342 17</div> </div>	12 Black Mountain Rd & Oviedo St <div> <div>465 13</div> <div>21 80</div> <div>32 12 99</div> <div>41 361 45</div> </div>
13 Black Mountain Rd & Carmel Mountain Rd <div> <div>57 673 489</div> <div>410 261 142</div> <div>119 381 221</div> <div>199 525 37</div> </div>	14 Black Mountain Rd & Paseo Montalban <div> <div>738 284</div> <div>200 93</div> <div>441 81</div> </div>	15 Black Mountain Rd & Twin Trails Dr <div> <div>729 102 54</div> <div>33 15 43</div> <div>329 458 97</div> <div>358 124 16</div> </div>	16 Black Mountain Rd & SR-56 WB Ramps <div> <div>814 988</div> <div>270 24 458</div> <div>662 667</div> </div>	17 Black Mountain Rd & SR-56 EB Ramps <div> <div>1156 378</div> <div>185 0 383</div> <div>1095 335</div> </div>	18 Black Mountain Rd & Park Village - Adolphia <div> <div>244 428 130</div> <div>101 34 145</div> <div>629 65 283</div> <div>79 642 50</div> </div>
19 Black Mountain Rd & Canyonside Park Dr <div> <div>33 1925</div> <div>8 773</div> </div>	20 Black Mountain Rd & Mercy Rd <div> <div>1365 426</div> <div>68 386</div> <div>23 527 314</div> </div>	21 Black Mountain Rd & Westview Parkway <div> <div>682 293</div> <div>174 31</div> <div>580 12</div> </div>	22 Carmel Mountain Rd & Sundevil Way <div> <div>71 0 50</div> <div>155 701 13</div> <div>223 808 20</div> <div>36 42 45</div> </div>	23 Carmel Mountain Rd & Paseo Montalban <div> <div>8 661 50</div> <div>55 85</div> <div>53 55 345</div> <div>153 809 23</div> </div>	24 Carmel Mountain Rd & SR-56 WB Ramps <div> <div>261 261 258</div> <div>213 543 428</div> <div>379 782 68</div> <div>216 95 40</div> </div>

LEGEND

10 ↗ AM Peak Hour Traffic

Figure 3-4
Existing AM Peak Hour Intersection Volumes



LEGEND

10 AM Peak Hour Traffic

Figure 3-4 cont.
Existing AM Peak Hour Intersection Volumes

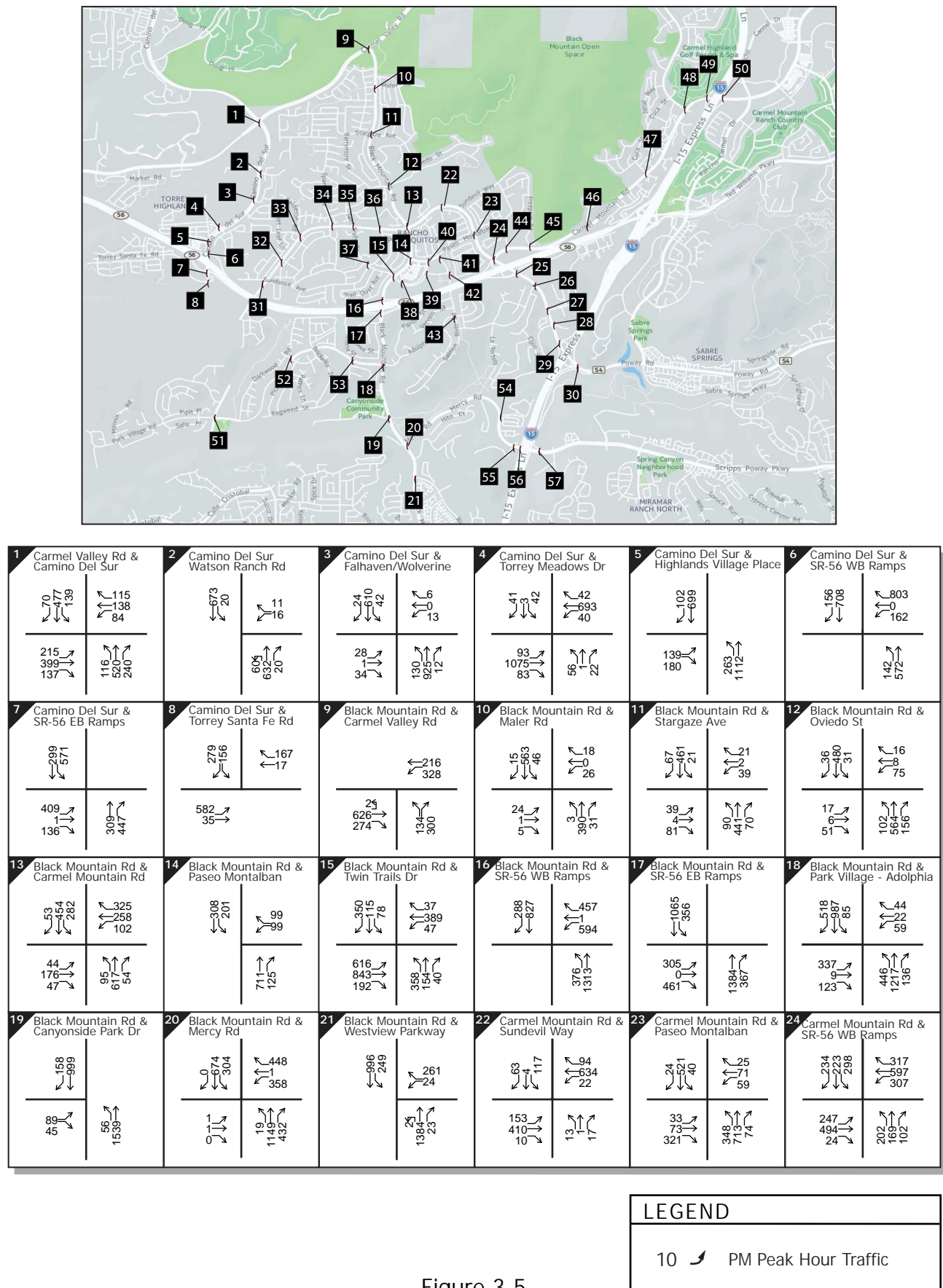
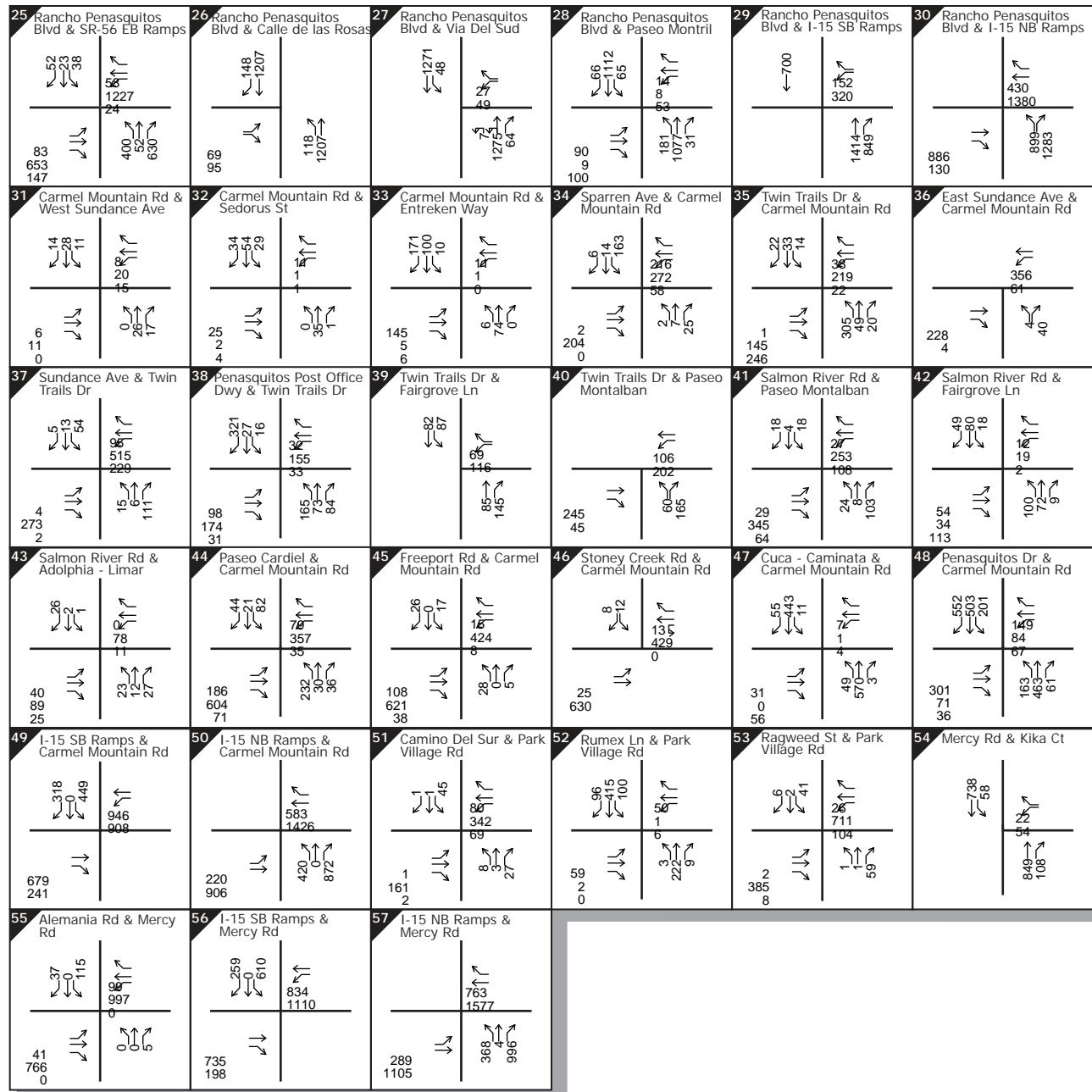


Figure 3-5
Existing PM Peak Hour Intersection Volumes



LEGEND

10 PM Peak Hour Traffic

Figure 3-5 cont.
Existing PM Peak Hour Intersection Volumes

CHAPTER 4 HORIZON YEAR CONDITIONS

As the remaining phases of development of the Rancho Peñasquitos community and neighboring communities would be intermittent between the existing year (2014) and 2050, with no specific phasing timelines, a Near-Term analysis was not considered applicable for this study. Therefore, this study focused on horizon year conditions utilizing long-range traffic volume forecasts for the year 2050.

HORIZON YEAR TRAFFIC VOLUMES

Long-range traffic growth is associated with land development, land use changes, increases in economic activity, and changes in demographics. For the study area, horizon year traffic volumes on the roadway network were estimated based on SANDAG's daily traffic volume forecasts. SANDAG's most current calibrated and validated base model was used for the base year and their 2050 model used for the horizon year, the latter reflecting complete build-out of Black Mountain Ranch and adjacent subareas. This 2050 model incorporates the updated land use/socio-economic projections and planned/programmed transportation improvements and changes for the region. The land use/socio-economic projections were augmented by the inclusion of three cumulative projects that are proposing Community Plan Amendments, described in Table 4-1.

**Table 4-1
Cumulative Projects**

Project Name	Location	Change in ADT	Approved?
Merge 56 (CPA) (19,500 daily trips to 19,040 trips)	Torrey Highlands/ Subarea IV	-459	No
Rhodes Crossing (CPA) (14 SFU TO 260 MDU)	Torrey Highlands/ Subarea IV	2,740	No
Kilroy Commercial Office (CPA)	Torrey Highlands/ Subarea IV	9,000	No

Horizon year daily volume forecasts were provided for two conditions: Without Project, which assumed the subject Black Mountain Road segment as a 6-Lane Primary Arterial, and With Project, which assumed the subject Black Mountain Road segment as a 4-Lane Major. The incremental differences in volumes and growth percentages between the two years, 2008 and 2050, both Without Project and With Project, were determined for the roadway network segments in common. These volume increments and growth percentages were over a time frame of 42 years, whereas the time frame for this study is 36 years, from 2014 to 2050. An adjustment factor of 0.857 (i.e., ratio of 36 / 42) was applied to the volume increments and growth percentages for the Without Project and With Project conditions to make them consistent with the 2014 - 2050 time frame. These adjusted daily volume increments and growth percentages were generally applied to the 2014 daily traffic count volumes of the 37 study segments, resulting in Without Project and With Project segment daily volumes for the horizon year. The resulting Without Project and With Project volumes were examined for reasonableness and also consistency with volumes at nearby study locations. At locations where volumes were found to grow negatively into the future per the models, we rounded up from existing to ensure zero negative growth into the future. An exception to this procedure was made along Rancho Peñasquitos Boulevard in the 6-lane 2050 scenario. At this location under this condition, Rancho Peñasquitos was allowed to have negative growth as the

model suggested, attributed to the increased volumes on the 6-lane configured Black Mountain Road. Segment growth rates, models and segment adjustments are provided in Appendix E.

The same SANDAG 2008, 2050 Without Project and 2050 With Project models were also used to estimate Without Project and With Project peak-hour turning movement volumes at the study intersections for the horizon year. The 2050 daily volumes were compared to the 2008 daily volumes to identify areas adjacent to or near study intersections showing negligible or no increase in volumes. These areas were further examined to see whether development within them appeared essentially completed. If so, it was reasoned that the turning movement volumes to and from the study intersections directly serving these areas would remain unchanged or increase only nominally.

Where the comparison between the 2050 and 2008 daily volumes showed meaningful increases, it was assumed that the percentage increases were also indicative of approximately the same increases in the peak-hour turning movement volumes at the adjacent or nearby study intersections. The segment growth factors described above along with additional area specific growth factors were applied to the estimation the future peak-hour turning movement volumes. As with the estimation of future daily volumes, the factor of 0.857 was applied to the growth factors to adjust for the time frame of 2014 to 2050, rather than 2008 to 2050. The adjusted growth factors were then applied to the 2014 peak-hour traffic count volumes of the adjacent or nearby study intersections, as appropriate, to estimate the Without Project and With Project peak-hour turning movement volumes for the horizon year.

HORIZON YEAR CIRCULATION NETWORK

The SANDAG transportation models used to develop the above traffic volume forecasts included horizon year improvements and changes to the circulation network in the Rancho Peñasquitos area. The model assumed two scenarios for the subject segment of Black Mountain Road between Twin Trails Drive and Mercy Road, one with the segment as a 6-Lane Primary Arterial (Without Project condition) and one with the segment as a 4-Lane Major (With Project condition). Both of these scenarios also include additional circulation network changes that were listed in Table 4-2. The horizon year roadway geometry and control conditions are shown in Figure 4-1 and 4-2.

The operational performance of the study segments and intersections for the horizon year, Without Project and With Project, are presented in Table 4-3 through Table 4-8. Figure 4-2 through 4-8 show the horizon year study segment and intersection volumes for the Without Project and With Project conditions. Details regarding horizon year operating conditions for each intersection can be found in the capacity analysis worksheets in Appendices F (With Project scenario) and G (Without Project scenario).

Table 4-2
Horizon Year (2050) Circulation Network Improvements/Changes

Roadway Segment and Intersection Locations	Improvement/Change	Project Source	Completion Date
Camino Del Sur			
From Carmel Valley Road to SR-56 Westbound Ramps	Widen from 4PA to 6MA	Torrey Highlands PFFP Project # T-2.2	Phase 3 @ 2,700 EDU of T.H. PFFP
From Torrey Santa Fe Road to Park Village Road	Construct road, modeled as 4MA, Merge 56 proposes to downgrade from 4MA to 2C	Torrey Highlands PFFP Project # T-3.1 A&B Rancho Penasquitos PFFP Project # T-4B	Phase 4 @3,610 EDU of T.H. PFFP
Carmel Valley Road			
From west of Camino Del Sur	Widen from 2C NF, 2MA to 4MA	Torrey Highlands PFFP Project # T-4.3 & T-4.4	Phase 3 @ 2,700 EDU of T.H. PFFP
Carmel Mountain Road			
From Via Panacea to Camino Del Sur	Construct road, modeled as 2C, Merge 56 proposes to downgrade classification from 4MA to 2C	Torrey Highlands PFFP Project # T-5.2	Phase 4 @3,610 EDU of T.H. PFFP
Carmel Mountain Road/Sedorus Street Intersection	Upgrade from AWSC to Signalized	K-B Homes Project Feature	Part of Project
Black Mountain Road			
From Twin Trails Drive to Mercy Road	Widen from 4MA to 6PA (Without Project Scenario)	Black Mountain Ranch PFFP Project #T-57	Phase 3 @4,270 EDU of B.M.R. PFFP
SR-56			
From I-5 to Ted Williams Parkway	Widen from 4 lanes to 6 lanes	Caltrans	2050 in Regional Plan
From SR-56 to I-5 North	Construct Fly-over ramps to I-5N	Caltrans	2035 in Regional Plan
SR-56 On-Ramps at Camino del Sur	Construct cloverleaf on-ramp loops	Torrey Highlands PFFP Project #T-1.3	Phased

Abbreviations: 2C NF: 2 lane collector with no fronting property. 2MA: 2 lane Major Arterial. 4MA: 4 lane Major Arterial. 4PA: 4 lane Prime Arterial. 6MA: 6 lane Major Arterial. 6PA: 6 lane Prime Arterial.

HORIZON YEAR TRAFFIC ANALYSIS AND IMPACTS

Significant traffic impacts due to volume changes associated with the Project were determined as described in Chapter 2. As can be seen in Table 4-5, significant segment impacts were found for Segment 11, Black Mountain Road south of Twin Trails Drive, and for Segment 13, Black Mountain Road north of Park Village Road-Adolphia Street. Segment 11 operates with a V/C ratio of 0.634 and an LOS C under the Without Project condition and with a V/C ratio of 0.939 and an LOS E under the With Project condition. In addition, Segment 13 operates with a V/C ratio of 0.732 and an LOS C under the Without Project condition and with a V/C ratio of 0.886 and an LOS E under

the With Project condition. These operating conditions are considered “significant impacts” according to the City’s criteria.

As can be seen in Table 4-6, a significant intersection impact was identified during the AM peak hour at Intersection 37, Sundance Avenue and Twin Trails Drive. This intersection is an all-way stop-controlled intersection and operates with an average delay of 38.8 seconds and an LOS E under the Without Project condition and an average delay of 46.4 seconds and an LOS E under the With Project condition. This 7.6 second difference along with an LOS E qualifies as a significant impact.

Table 4-8 presents the results of the freeway mainline analysis conducted for horizon year conditions. The volumes, peak hour factors, directional factors, and truck percentages were obtained from Caltrans and compiled into Appendix I. One significant freeway mainline impacts was found within the study area during this analysis. The freeway mainline significant impact was found in the PM peak hour on eastbound SR-56 between Camino del Sur and Black Mountain Road.

It should be noted that some freeway mainline segments had V/C ratios that improved due to the project. This phenomenon occurs to changes in anticipated traffic patterns reflected in SANDAG’s 2050 scenario models. Generally, the model runs prepared by SANDAG for the two scenarios show a slight shift of traffic in the future when Black Mountain Road is limited to four lanes in the future. With a lower capacity on Black Mountain Road in the future as the result of being held to four, rather than six, lanes traffic somewhat increases on two bypass routes. Those routes consist of portions of I-15 between Mercy Road and SR56 and SR56 between I-15 and Black Mountain Road. The initial future model volumes tend to have around 1,000 to 2,000 ADT more traffic on these two freeways within these limits, and beyond those limits the differences are minimal. Similarly, the portion of Penasquitos Blvd to the west of I-15 and northerly to SR56 also has about 1,000 more ADT on the four lane alternative for Black Mountain Road presumably due to bypass traffic that otherwise would have been using Black Mountain Road.

An on-ramp metering delay analysis was conducted for horizon year conditions. The results of this analysis are presented in Table 4-9. The most restrictive ramp metering rates in Appendix I were assumed for this analysis. One ramp metering delay impact was also found within the study area. In the AM peak hour, the Rancho Penasquitos Blvd – SR56 WB on ramp is anticipated to experience an increase in delay of 3 minutes from about 21 minutes to 24 minutes, resulting in a significant impact.

An ILV analysis of horizon year conditions was also performed for controlled interchanges. The calculation worksheets are included in Appendix N.

Figure 4-9 shows the locations where significant impacts occur and whether or not mitigations are provided.

Table 4-3
Horizon Year Without Project (Black Mountain Rd as 6 Lanes)
Roadway Segment Conditions

Segment Number and Name	Lanes/ Class	LOS E (Capacity)	W/O Project ADT	V/C	LOS
1. Camino Del Sur s/o Carmel valley Road	6MA	50,000	25,903	0.518	B
2. Camino Del Sur s/o Wolverine Way - Fallhaven Road	6MA	50,000	30,260	0.605	C
3. Camino Del Sur n/o SR-56 Westbound Ramps	6MA	50,000	37,874	0.757	C
4. Camino Del Sur s/o SR-56 Eastbound Ramps	6MA	50,000	26,700	0.534	B
5. Carmel Valley Road w/o Black Mountain Road	4MA	40,000	17,223	0.431	B
6. Carmel Valley Road e/o Black Mountain Road	4MA	40,000	22,648	0.566	C
7. Black Mountain Road n/o Maler Road	4MA	40,000	18,262	0.457	B
8. Black Mountain Road s/o Oviedo Street	4MA	40,000	23,562	0.589	C
9. Black Mountain Road s/o Carmel Mountain Road	4MA	40,000	18,353	0.459	B
10. Black Mountain Road bet. Paseo Montalban & Twin Trails Drive	4MA	40,000	17,824	0.446	B
11. Black Mountain Road s/o Twin Trails Drive	6PA	60,000	38,028	0.634	C
12. Black Mountain Road bet. SR-56 Westbound & Eastbound Ramps	6PA	60,000	34,707	0.578	B
13. Black Mountain Road n/o Park Village Road - Adolphia Street	6PA	60,000	43,949	0.732	C
14. Black Mountain Road n/o Canyonside Park Drive	6PA	60,000	40,431	0.674	C
15. Black Mountain Road bet. Mercy Road & Babuta Road	6PA	60,000	38,411	0.640	C
16. Black Mountain Road s/o Westview Parkway	6PA	60,000	29,564	0.493	B
17. Westview Parkway e/o Black Mountain Road	4C	30,000	8,854	0.295	A
18. Carmel Mountain Road bet. Paseo Aldabra & Sundevil Way	4MA	40,000	14,661	0.367	A
19. Carmel Mountain Road bet. Paseo Montalban & SR-56 Westbound Ramps	4MA	40,000	22,696	0.567	C
20. Rancho Penasquitos Blvd bet. SR-56 EB Ramps - Azuaga St & Calle De Las Rosas	4MA	40,000	26,218	0.655	C
21. Rancho Penasquitos Boulevard bet. Calle De Las Rosas & Via Del Sud	4MA	40,000	26,867	0.672	C
22. Rancho Penasquitos Boulevard bet. Paseo Montril & I-15 Southbound Ramps	4MA	40,000	31,592	0.790	D
23. Poway Road e/o I-15 Northbound Ramps	6PA	60,000	53,230	0.887	D
24. Carmel Mountain Road s/o Sundance Avenue	4MA	40,000	9,784	0.245	A
25. Carmel Mountain Road w/o Sparren Avenue	4MA	40,000	8,895	0.222	A
26. Carmel Mountain Road w/o Black Mountain Road	4MA	40,000	10,400	0.260	A
27. Sundance Avenue w/o War Bonnet Street*	-	-	2,500	-	-
28. Carmel Mountain Road e/o Freeport Road	4MA	40,000	14,425	0.361	A
29. Carmel Mountain Road bet. Penasquitos Drive & Gerana Street	4MA	40,000	17,389	0.435	B
30. Carmel Mountain Road bet. I-15 Southbound Ramps & Penasquitos Drive	4MA	40,000	29,444	0.736	C
31. Carmel Mountain Road e/o I-15 Northbound Ramps	6PA	60,000	52,794	0.880	D
32. Camino Del Sur n/o Park Village Road	4MA	40,000	10,700	0.268	A
33. Park Village Road e/o Camino Del Sur	4MA	40,000	12,600	0.315	A
34. Park Village Road w/o Black Mountain Road	4MA	40,000	17,757	0.444	B
35. Mercy Road bet. Chabola Road & Branicole Ln	4MA	40,000	18,662	0.467	B
36. Mercy Road n/o Alemania Road	4MA	40,000	23,662	0.592	C
37. Scripps Poway Parkway e/o I-15 Northbound Ramps	6PA	60,000	63,408	1.057	F

* Capacity for local residential street not specified in *San Diego Traffic Impact Study Manual, July 2008*.

Abbreviations: 4C: 4 lane Collector. 4MA: 4 lane Major Arterial. 6MA: 6 lane Major Arterial. 6PA: 6 lane Prime Arterial.

Table 4-4
Horizon Year With Project (Black Mountain Rd as 4 Lanes)
Roadway Segment Conditions

Segment Number and Name	Lanes/ Class	LOS E (Capacity)	W/ Project ADT	V/C	LOS
1. Camino Del Sur s/o Carmel valley Road	6MA	50,000	25,250	0.505	B
2. Camino Del Sur s/o Wolverine Way - Fallhaven Road	6MA	50,000	29,497	0.590	C
3. Camino Del Sur n/o SR-56 Westbound Ramps	6MA	50,000	36,919	0.738	C
4. Camino Del Sur s/o SR-56 Eastbound Ramps	6MA	50,000	27,400	0.548	B
5. Carmel Valley Road w/o Black Mountain Road	4MA	40,000	17,349	0.434	B
6. Carmel Valley Road e/o Black Mountain Road	4MA	40,000	22,814	0.570	C
7. Black Mountain Road n/o Maler Road	4MA	40,000	19,204	0.480	B
8. Black Mountain Road s/o Oviedo Street	4MA	40,000	23,472	0.587	C
9. Black Mountain Road s/o Carmel Mountain Road	4MA	40,000	17,709	0.443	B
10. Black Mountain Road bet. Paseo Montalban & Twin Trails Drive	4MA	40,000	17,198	0.430	B
11. Black Mountain Road s/o Twin Trails Drive	4MA	40,000	37,540	0.939	E
12. Black Mountain Road bet. SR-56 Westbound & Eastbound Ramps	4MA	40,000	34,261	0.857	D
13. Black Mountain Road n/o Park Village Road - Adolphia Street	4MA	40,000	35,500	0.888	E
14. Black Mountain Road n/o Canyonside Park Drive	4MA	40,000	34,677	0.867	D
15. Black Mountain Road bet. Mercy Road & Babuta Road	6PA	60,000	32,944	0.549	B
16. Black Mountain Road s/o Westview Parkway	6PA	60,000	25,356	0.423	B
17. Westview Parkway e/o Black Mountain Road	4C	30,000	7,197	0.240	A
18. Carmel Mountain Road bet. Paseo Aldabra & Sundevil Way	4MA	40,000	14,819	0.370	A
19. Carmel Mountain Road bet. Paseo Montalban & SR-56 Westbound Ramps	4MA	40,000	22,940	0.574	C
20. Rancho Penasquitos Blvd bet. SR-56 EB Ramps - Azuaga St & Calle De Las Rosas	4MA	40,000	27,500	0.688	C
21. Rancho Penasquitos Boulevard bet. Calle De Las Rosas & Via Del Sud	4MA	40,000	28,200	0.705	C
22. Rancho Penasquitos Boulevard bet. Paseo Montril & I-15 Southbound Ramps	4MA	40,000	33,100	0.828	D
23. Poway Road e/o I-15 Northbound Ramps	6PA	60,000	53,230	0.887	D
24. Carmel Mountain Road s/o Sundance Avenue	4MA	40,000	9,980	0.250	A
25. Carmel Mountain Road w/o Sparren Avenue	4MA	40,000	9,312	0.233	A
26. Carmel Mountain Road w/o Black Mountain Road	4MA	40,000	10,600	0.265	A
27. Sundance Avenue w/o War Bonnet Street*	-	-	2,600	-	-
28. Carmel Mountain Road e/o Freeport Road	4MA	40,000	14,396	0.360	A
29. Carmel Mountain Road bet. Penasquitos Drive & Gerana Street	4MA	40,000	17,354	0.434	B
30. Carmel Mountain Road bet. I-15 Southbound Ramps & Penasquitos Drive	4MA	40,000	29,337	0.733	C
31. Carmel Mountain Road e/o I-15 Northbound Ramps	6PA	60,000	52,601	0.877	D
32. Camino Del Sur n/o Park Village Road	4MA	40,000	10,200	0.255	A
33. Park Village Road e/o Camino Del Sur	4MA	40,000	11,700	0.293	A
34. Park Village Road w/o Black Mountain Road	4MA	40,000	17,600	0.440	B
35. Mercy Road bet. Chabola Road & Branicole Ln	4MA	40,000	17,420	0.436	B
36. Mercy Road n/o Alemania Road	4MA	40,000	22,420	0.561	C
37. Scripps Poway Parkway e/o I-15 Northbound Ramps	6PA	60,000	62,005	1.033	F

* Capacity for local residential street not specified in *San Diego Traffic Impact Study Manual, July 2008*.

Abbreviations: 4C: 4 lane Collector. 4MA: 4 lane Major Arterial. 6MA: 6 lane Major Arterial. 6PA: 6 lane Prime Arterial.

Table 4-5
Horizon Year Comparison of
Roadway Segment Conditions

Segment Number and Name	2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		Difference	Impact
	V/C	LOS	V/C	LOS		
1. Camino Del Sur s/o Carmel valley Road	0.518	B	0.505	B	-0.01	No
2. Camino Del Sur s/o Wolverine Way - Fallhaven Road	0.605	C	0.590	C	-0.02	No
3. Camino Del Sur n/o SR-56 Westbound Ramps	0.757	C	0.738	C	-0.02	No
4. Camino Del Sur s/o SR-56 Eastbound Ramps	0.534	B	0.548	B	0.01	No
5. Carmel Valley Road w/o Black Mountain Road	0.431	B	0.434	B	0.00	No
6. Carmel Valley Road e/o Black Mountain Road	0.566	C	0.570	C	0.00	No
7. Black Mountain Road n/o Maler Road	0.457	B	0.480	B	0.02	No
8. Black Mountain Road s/o Oviedo Street	0.589	C	0.587	C	0.00	No
9. Black Mountain Road s/o Carmel Mountain Road	0.459	B	0.443	B	-0.02	No
10. Black Mountain Road bet. Paseo Montalban & Twin Trails Drive	0.446	B	0.430	B	-0.02	No
11. Black Mountain Road s/o Twin Trails Drive	0.634	C	0.939	E	0.31	Yes
12. Black Mountain Road bet. SR-56 Westbound & Eastbound Ramps	0.578	B	0.857	D	0.28	No
13. Black Mountain Road n/o Park Village Road - Adolphia Street	0.732	C	0.888	E	0.16	Yes
14. Black Mountain Road n/o Canyonside Park Drive	0.674	C	0.867	D	0.19	No
15. Black Mountain Road bet. Mercy Road & Babuta Road	0.640	C	0.549	B	-0.09	No
16. Black Mountain Road s/o Westview Parkway	0.493	B	0.423	B	-0.07	No
17. Westview Parkway e/o Black Mountain Road	0.295	A	0.240	A	-0.06	No
18. Carmel Mountain Road bet. Paseo Aldabra & Sundevil Way	0.367	A	0.370	A	0.00	No
19. Carmel Mountain Road bet. Paseo Montalban & SR-56 Westbound Ramps	0.567	C	0.574	C	0.01	No
20. Rancho Penasquitos Blvd bet. SR-56 EB Ramps - Azuaga St & Calle De Las Rosas	0.655	C	0.688	C	0.03	No
21. Rancho Penasquitos Boulevard bet. Calle De Las Rosas & Via Del Sud	0.672	C	0.705	C	0.03	No
22. Rancho Penasquitos Boulevard bet. Paseo Monril & I-15 Southbound Ramps	0.790	D	0.828	D	0.04	No
23. Poway Road e/o I-15 Northbound Ramps	0.887	D	0.887	D	0.00	No
24. Carmel Mountain Road s/o Sundance Avenue	0.245	A	0.250	A	0.01	No
25. Carmel Mountain Road w/o Sparren Avenue	0.222	A	0.233	A	0.01	No
26. Carmel Mountain Road w/o Black Mountain Road	0.260	A	0.265	A	0.01	No
27. Sundance Avenue w/o War Bonnet Street*	-	-	-	-	-	-
28. Carmel Mountain Road e/o Freeport Road	0.361	A	0.360	A	0.00	No
29. Carmel Mountain Road bet. Penasquitos Drive & Gerana Street	0.435	B	0.434	B	0.00	No
30. Carmel Mountain Road bet. I-15 Southbound Ramps & Penasquitos Drive	0.736	C	0.733	C	0.00	No
31. Carmel Mountain Road e/o I-15 Northbound Ramps	0.880	D	0.877	D	0.00	No
32. Camino Del Sur n/o Park Village Road	0.268	A	0.255	A	-0.01	No
33. Park Village Road e/o Camino Del Sur	0.315	A	0.293	A	-0.02	No
34. Park Village Road w/o Black Mountain Road	0.444	B	0.440	B	0.00	No
35. Mercy Road bet. Chabola Road & Branicole Ln	0.467	B	0.436	B	-0.03	No
36. Mercy Road n/o Alemania Road	0.592	C	0.561	C	-0.03	No
37. Scripps Poway Parkway e/o I-15 Northbound Ramps	1.057	F	1.033	F	-0.02	No

* Capacity for local residential street not specified in *San Diego Traffic Impact Study Manual, July 2008*.

Table 4-6
Horizon Year AM Peak Hour
Intersection Conditions

Intersection Number and Name	2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		Comparison	
	Delay	LOS	Delay	LOS	Δ Delay	Impact
1. Camino Del Sur/Carmel Valley Road	56.7	E	56.0	E	-0.7	No
2. Camino Del Sur/Watson Ranch Road	8.4	A	8.3	A	-0.1	No
3. Camino Del Sur/Wolverine Way - Fallhaven Road	22.2	C	20.4	C	-1.8	No
4. Camino Del Sur/Torrey Meadows Drive	16.5	B	16.7	B	0.2	No
5. Camino Del Sur/Highlands Village Place	15.4	B	14.9	B	-0.5	No
6. Camino Del Sur/SR-56 Westbound Ramps	17.5	B	17.8	B	0.3	No
7. Camino Del Sur/SR-56 Eastbound Ramps	10.4	B	10.2	B	-0.2	No
8. Camino Del Sur/Torrey Santa Fe Road	13.4	B	13.3	B	-0.1	No
9. Black Mountain Road/Carmel Valley Road	22.3	C	22.5	C	0.2	No
10. Black Mount Road/Maler Road	7.8	A	8.0	A	0.2	No
11. Black Mountain Road/Stargaze Avenue	14.7	B	13.4	B	-1.3	No
12. Black Mountain Road/Oviedo Street	17.0	B	26.3	C	9.3	No
13. Black Mountain Road/Carmel Mountain Road	44.0	D	47.9	D	3.9	No
14. Black Mountain Road/Paseo Montalban	12.4	B	12.8	B	0.4	No
15. Black Mountain Road/Twin Trails Drive	52.9	D	54.4	D	1.5	No
16. Black Mountain Road/SR-56 Westbound Ramps	47.3	D	45.0	D	-2.3	No
17. Black Mountain Road/SR-56 Eastbound Ramps	22.4	C	23.1	C	0.7	No
18. Black Mountain Road/Park Village Road - Adolphia Street	33.9	C	37.3	D	3.4	No
19. Black Mountain Road/Canyonside Park Drive	2.5	A	5.2	A	2.7	No
20. Black Mountain Road/Mercy Road	24.4	C	27.4	C	3.0	No
21. Black Mountain Road/Westview Parkway	16.3	B	14.5	B	-1.8	No
22. Carmel Mountain Road/Sundevil Way	16.0	B	15.6	B	-0.4	No
23. Carmel Mountain Road/Paseo Montalban	24.0	C	23.8	C	-0.2	No
24. Carmel Mountain Road/SR-56 WB Ramps - Rancho Penasquitos Boulevard	45.7	D	46.0	D	0.3	No
25. Rancho Penasquitos Boulevard/SR-56 Eastbound Ramps - Azuaga Street	24.8	C	24.2	C	-0.6	No
26. Rancho Penasquitos Boulevard/Calle De Las Rosas	10.3	B	9.9	A	-0.4	No
27. Rancho Penasquitos Boulevard/Via Del Sud	4.3	A	4.6	A	0.3	No
28. Rancho Penasquitos Boulevard/Paseo Montri	13.6	B	13.6	B	0.0	No
29. Rancho Penasquitos Boulevard/I-15 Southbound Off-Ramp	8.2	A	8.4	A	0.2	No
30. Rancho Penasquitos Boulevard/I-15 Northbound Off-Ramp	15.0	B	15.6	B	0.6	No
31. Carmel Mountain Road/(West) Sundance Avenue	12.9	B	12.9	B	0.0	No
32. Carmel Mountain Road/Sedorus Street (All-way stop control)*	8.2	A	8.1	A	-0.1	No
33. Carmel Mountain Road/Entrecken Way	22.6	C	22.6	C	0.0	No
34. Sparren Avenue/Carmel Mountain Road	32.1	C	28.2	C	-3.9	No
35. Twin Trails Drive/Carmel Mountain Road	25.9	C	29.5	C	3.6	No
36. (East) Sundance Avenue/Carmel Mountain Road (Two-way stop control)**	15.5	C	15.2	C	-0.3	No
37. Sundance Avenue/Twin Trails Drive (All-way stop control)	38.8	E	46.4	E	7.6	Yes
38. Penasquitos Post Office Driveway/Twin Trails Drive	18.3	B	18.4	B	0.1	No
39. Twin Trails Drive/Fairgrove Lane (All-way stop control)	8.0	A	8.1	A	0.1	No
40. Twin Trails Drive/Paseo Montalban	11.0	B	11.1	B	0.1	No
41. Salmon River Road/Paseo Montalban	13.9	B	13.2	B	-0.7	No
42. Salmon River Road/Fairgrove Lane (All-way stop control)	8.0	A	8.0	A	0.0	No
43. Salmon River Road/Adolphia Street - Limar Way (All-way stop control)	7.5	A	7.5	A	0.0	No
44. Paseo Cardiel/Carmel Mountain Road	20.2	C	20.3	C	0.1	No
45. Freeport Road/Carmel Mountain Road	5.8	A	6.4	A	0.6	No
46. Stoney Creek Road/Carmel Mountain Road	9.0	A	8.9	A	-0.1	No
47. Cuca Street - Caminata Deluz/Carmel Mountain Road	12.2	B	12.2	B	0.0	No
48. Penasquitos Drive/Carmel Mountain Road	29.0	C	29.0	C	0.0	No
49. I-15 Southbound Ramps/Carmel Mountain Road	19.7	B	20.1	C	0.4	No
50. I-15 Northbound Ramps/Carmel Mountain Road	25.2	C	25.3	C	0.1	No
51. Camino Del Sur/Park Village Road	51.6	D	45.6	D	-6.0	No
52. Rumex Lane/Park Village Road	7.8	A	7.9	A	0.1	No
53. Ragweed Street/Park Village Road	16.0	B	16.4	B	0.4	No
54. Mercy Road/Kika Court	7.8	A	7.8	A	0.0	No
55. Alemania Road/Mercy Road	9.8	A	9.9	A	0.1	No
56. I-15 Southbound Ramps/Mercy Road	35.5	D	34.8	C	-0.7	No
57. I-15 Northbound Ramps/Mercy Road - Scripps Poway Parkway	77.0	E	70.1	E	-6.9	No

* Assumes a signalization upgrade in 2050 scenarios.

** Worst case control delay and LOS shown.

Table 4-7
Horizon Year PM Peak Hour
Intersection Conditions

Intersection Number and Name	2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		Difference	
	Delay	LOS	Delay	LOS	Delay	Impact
1. Camino Del Sur/Carmel Valley Road	45.9	D	45.4	D	-0.5	No
2. Camino Del Sur/Watson Ranch Road	6.7	A	5.6	A	-1.1	No
3. Camino Del Sur/Wolverine Way - Fallhaven Road	20.2	C	18.3	B	-1.9	No
4. Camino Del Sur/Torrey Meadows Drive	13.7	B	14.0	B	0.3	No
5. Camino Del Sur/Highlands Village Place	16.6	B	16.8	B	0.2	No
6. Camino Del Sur/SR-56 Westbound Ramps	19.7	B	20.2	C	0.5	No
7. Camino Del Sur/SR-56 Eastbound Ramps	16.8	B	16.8	B	0.0	No
8. Camino Del Sur/Torrey Santa Fe Road	19.2	B	19.7	B	0.5	No
9. Black Mountain Road/Carmel Valley Road	47.9	D	48.8	D	0.9	No
10. Black Mount Road/Maler Road	7.5	A	7.6	A	0.1	No
11. Black Mountain Road/Stargaze Avenue	14.0	B	14.8	B	0.8	No
12. Black Mountain Road/Oviedo Street	17.6	B	26.0	C	8.4	No
13. Black Mountain Road/Carmel Mountain Road	28.5	C	28.3	C	-0.2	No
14. Black Mountain Road/Paseo Montalban	14.8	B	15.1	B	0.3	No
15. Black Mountain Road/Twin Trails Drive	40.5	D	32.0	C	-8.5	No
16. Black Mountain Road/SR-56 Westbound Ramps	34.4	C	34.7	C	0.3	No
17. Black Mountain Road/SR-56 Eastbound Ramps	26.1	C	26.2	C	0.1	No
18. Black Mountain Road/Park Village Road - Adolphia Street	29.7	C	29.4	C	-0.3	No
19. Black Mountain Road/Canyonside Park Drive	4.8	A	6.8	A	2.0	No
20. Black Mountain Road/Mercy Road	37.2	D	31.8	C	-5.4	No
21. Black Mountain Road/Westview Parkway	22.7	C	20.5	C	-2.2	No
22. Carmel Mountain Road/Sundevil Way	14.6	B	14.6	B	0.0	No
23. Carmel Mountain Road/Paseo Montalban	23.3	C	23.1	C	-0.2	No
24. Carmel Mountain Road/SR-56 WB Ramps - Rancho Penasquitos Boulevard	35.6	D	35.3	D	-0.3	No
25. Rancho Penasquitos Boulevard/SR-56 Eastbound Ramps - Azuaga Street	70.7	E	69.4	E	-1.3	No
26. Rancho Penasquitos Boulevard/Calle De Las Rosas	9.5	A	10.0	A	0.5	No
27. Rancho Penasquitos Boulevard/Via Del Sud	3.9	A	4.5	A	0.6	No
28. Rancho Penasquitos Boulevard/Paseo Montrail	14.5	B	14.5	B	0.0	No
29. Rancho Penasquitos Boulevard/I-15 Southbound Off-Ramp	9.7	A	9.7	A	0.0	No
30. Rancho Penasquitos Boulevard/I-15 Northbound Off-Ramp	19.4	B	20.6	C	1.2	No
31. Carmel Mountain Road/(West) Sundance Avenue	16.0	B	16.5	B	0.5	No
32. Carmel Mountain Road/Sedorus Street (All-way stop control)*	5.2	A	5.1	A	-0.1	No
33. Carmel Mountain Road/Entrecken Way	12.6	B	12.5	B	-0.1	No
34. Sparren Avenue/Carmel Mountain Road	20.1	C	20.2	C	0.1	No
35. Oviedo Street/Carmel Mountain Road	20.1	C	19.6	B	-0.5	No
36. (East) Sundance Avenue/Carmel Mountain Road (Two-way stop control)**	10.3	B	10.3	B	0.0	No
37. Sundance Avenue/Twin Trails Drive (All-way stop control)	23.8	C	27.5	D	3.7	No
38. Penasquitos Post Office Driveway/Twin Trails Drive	26.6	C	26.1	C	-0.5	No
39. Twin Trails Drive/Fairgrove Lane (All-way stop control)	9.1	A	9.2	A	0.1	No
40. Twin Trails Drive/Paseo Montalban	12.9	B	13.0	B	0.1	No
41. Salmon River Road/Paseo Montalban	15.1	B	11.9	B	-3.2	No
42. Salmon River Road/Fairgrove Lane (All-way stop control)	8.8	A	8.9	A	0.1	No
43. Salmon River Road/Adolphia Street - Limar Way (All-way stop control)	7.9	A	7.9	A	0.0	No
44. Paseo Cardiel/Carmel Mountain Road	25.1	C	27.3	C	2.2	No
45. Freeport Road/Carmel Mountain Road	5.1	A	7.5	A	2.4	No
46. Stoney Creek Road/Carmel Mountain Road	4.2	A	3.7	A	-0.5	No
47. Cuca Street - Caminata Deluz/Carmel Mountain Road	10.9	B	10.8	B	-0.1	No
48. Penasquitos Drive/Carmel Mountain Road	30.9	C	30.8	C	-0.1	No
49. I-15 Southbound Ramps/Carmel Mountain Road	35.4	D	35.5	D	0.1	No
50. I-15 Northbound Ramps/Carmel Mountain Road	50.5	D	51.4	D	0.9	No
51. Camino Del Sur/Park Village Road	23.7	C	23.8	C	0.1	No
52. Rumex Lane/Park Village Road	6.9	A	7.0	A	0.1	No
53. Ragweed Street/Park Village Road	16.1	B	16.6	B	0.5	No
54. Mercy Road/Kika Court	8.3	A	7.5	A	-0.8	No
55. Alemania Road/Mercy Road	10.6	B	10.3	B	-0.3	No
56. I-15 Southbound Ramps/Mercy Road	40.5	D	37.6	D	-2.9	No
57. I-15 Northbound Ramps/Mercy Road - Scripps Poway Parkway	61.7	E	52.9	D	-8.8	No
* Assumes a signalization upgrade in 2050 scenarios.						
** Worst case control delay and LOS shown.						

Table 4-8A
Horizon Year Freeway Mainline Analysis
SR-56 Westbound and Eastbound

Freeway Segment	AM/PM	LOS E Capacity	Long Term Without Project (BMR 6-Lanes)			Long Term With Project (BMR 4-Lanes)			Comparison	
			PHV	V/C	LOS	PHV	V/C	LOS	Δ V/C	Significant?
SR-56 Westbound										
West of Camino del Sur	AM	7,050	7,984	1.132	F	8,011	1.136	F	0.004	No
	PM	7,050	2,937	0.417	B	2,947	0.418	B	0.001	No
Camino del Sur to Black Mountain Rd	AM	7,050	7,888	1.119	F	7,925	1.124	F	0.005	No
	PM	7,050	2,902	0.412	B	2,916	0.414	B	0.002	No
Black Mountain Road to Rancho Penasquitos Blvd	AM	8,850	7,147	0.808	D	7,062	0.798	C	-0.010*	No
	PM	8,850	2,629	0.297	A	2,598	0.294	A	-0.003*	No
Rancho Penasquitos Blvd to I-15 Interchange	AM	7,050	7,026	0.997	E	6,928	0.983	E	-0.014*	No
	PM	7,050	2,585	0.367	A	2,549	0.362	A	-0.005*	No
SR-56 Eastbound										
West of Camino del Sur	AM	7,050	3,060	0.434	B	3,071	0.436	B	0.002	No
	PM	7,050	7,838	1.112	F	7,864	1.115	F	0.003	No
Camino del Sur to Black Mountain Rd	AM	7,050	3,024	0.429	B	3,038	0.431	B	0.002	No
	PM	7,050	7,744	1.098	F	7,780	1.104	F	0.006	Yes
Black Mountain Road to Rancho Penasquitos Blvd	AM	7,050	2,739	0.389	A	2,707	0.384	A	-0.005*	No
	PM	7,050	7,016	0.995	E	6,933	0.983	E	-0.012*	No
Rancho Penasquitos Blvd to I-15 Interchange	AM	7,050	2,693	0.382	A	2,656	0.377	A	-0.005*	No
	PM	7,050	6,897	0.978	E	6,802	0.965	E	-0.013*	No

Peak Hour Volume = (ADT)(K)(D)/(Truck Factor))

V/C = Peak Hour Volume / Capacity

Truck Source: 2013 Annual Average Daily Truck Traffic on the California State Highway System

ADT Source: SANDAG Modeling (Appendix E)

K/D Source: 2013 K and D Factors on the California State Highway System

Footnote:

* These locations see decrease in V/C due to decreased in Total ADT per Model Runs
 See Appendix E for SANDAG models. See description in Freeway Mainline
 portion of Chapter 4 for discussion.

Hourly Capacity Assumptions

Mainline - 2350 vph; Auxiliary - 1800 vph; Managed - 1680 vph; HOV - 1600 vph

Table 4-8B
Horizon Year Freeway Mainline Analysis
I-15 Northbound and Southbound

Freeway Segment	AM/PM	LOS E Hourly Capacity	Long Term Without Project (BMR 6-Lanes)			Long Term With Project (BMR 4-Lanes)			Comparison	
			PHV	V/C	LOS	PHV	V/C	LOS	Δ V/C	Significant?
I-15 Northbound										
South of Mercy Road	AM	16,910	21,045	1.245	F	20,952	1.239	F	-0.006*	No
	PM	16,910	15,511	0.917	D	15,442	0.913	D	-0.004*	No
Mercy Road to Rancho Penasquitos Blvd	AM	16,910	20,460	1.210	F	20,211	1.195	F	-0.015*	No
	PM	16,910	15,080	0.892	D	14,896	0.881	D	-0.011*	No
Rancho Penasquitos Blvd to Ted Williams Pkwy	AM	15,110	18,824	1.246	F	18,612	1.232	F	-0.014*	No
	PM	15,110	13,874	0.918	D	13,717	0.908	D	-0.010*	No
Ted Williams Pkwy to Carmel Mountain Rd	AM	16,910	18,503	1.094	F	18,501	1.094	F	0.000	No
	PM	16,910	13,638	0.807	D	13,636	0.806	D	-0.001*	No
North of Carmel Mountain Rd	AM	16,910	19,356	1.145	F	19,374	1.146	F	0.001	No
	PM	16,910	11,821	0.699	C	11,832	0.700	C	0.001	No
I-15 Southbound										
South of Mercy Road	AM	16,910	15,447	0.913	D	15,379	0.909	D	-0.004*	No
	PM	16,910	20,797	1.230	F	20,705	1.224	F	-0.006*	No
Mercy Road to Rancho Penasquitos Blvd	AM	16,910	15,018	0.888	D	14,835	0.877	D	-0.011*	No
	PM	16,910	20,219	1.196	F	19,973	1.181	F	-0.015*	No
Rancho Penasquitos Blvd to Ted Williams Pkwy	AM	16,910	13,817	0.817	D	13,661	0.808	D	-0.009*	No
	PM	16,910	18,602	1.100	F	18,393	1.088	F	-0.012*	No
Ted Williams Pkwy to Carmel Mountain Rd	AM	16,910	13,582	0.803	D	13,580	0.803	D	0.000	No
	PM	16,910	18,286	1.081	F	18,283	1.081	F	0.000	No
North of Carmel Mountain Rd	AM	15,110	8,454	0.559	B	8,462	0.560	B	0.001	No
	PM	15,110	19,329	1.279	F	19,347	1.280	F	0.001	No

Peak Hour Volume = (ADT)(K)(D)/(Truck Factor))

V/C = Peak Hour Volume / Capacity

Truck Source: 2013 Annual Average Daily Truck Traffic on the California State Highway System

ADT Source: SANDAG Modeling (Appendix E)

K/D Source: 2013 K and D Factors on the California State Highway System

Footnote:

* These locations see decrease in V/C due to decreased in Total ADT per Model Runs
 See Appendix E for SANDAG models. See description in Freeway Mainline
 portion of Chapter 4 for discussion.

Hourly Capacity Assumptions

Mainline - 2350 vph; Auxiliary - 1800 vph; Managed - 1680 vph; HOV - 1600 vph

Table 4-9
Horizon Year Freeway Interchange On-Ramp Metering Delay

Location	# of Lanes	Meter Rate (veh/hr/ lane)	Meter Rate (veh/hr)	Without Project				With Project				Comparison	
				Demand (veh/hr)	Excess Demand (veh/hr)	Delay (min)	Queue (ft)	Demand (veh/hr)	Excess Demand (veh/hr)	Delay (min)	Queue (ft)	Δ Delay	Significant
AM Peak Hour													
Camino del Sur - SR56 WB Ramp	2	435	870	718	0	0	0	702	0	0	0	0	No
Camino del Sur - SR56 WB Ramp (HOV)	1	435	435	80	0	0	0	78	0	0	0	0	No
Black Mountain Road - SR56 WB Ramp	2	520	1,040	1,524	484	28	14,027	1,503	463	27	13,427	-1	No
Black Mountain Road - SR56 WB Ramp (HOV)	1	520	520	169	0	0	0	167	0	0	0	0	No
Rancho Penasquitos - SR56 WB Ramp	1	600	600	811	211	21	6,119	835	235	24	6,815	3	Yes
Carmel Mountain Road - I15 SB Ramp	2	367	734	909	175	14	5,075	905	171	14	4,971	0	No
Carmel Mountain Road - I15 SB Ramp (HOV)	1	367	367	101	0	0	0	101	0	0	0	0	No
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	2	492	984	1,733	749	46	21,721	1,737	753	46	21,837	0	No
Rancho Penasquitos - I15 SB Ramp - EB->SB	2	492	984	797	0	0	0	801	0	0	0	0	No
Mercy Road - I15 SB Ramp	2	420	840	1,294	454	32	13,172	1,227	387	28	11,214	-4	No
Mercy Road - I15 SB Ramp (HOV)	1	420	420	144	0	0	0	136	0	0	0	0	No
PM Peak Hour													
Camino del Sur - SR56 EB Ramp	2	480	960	1,212	252	16	7,317	1,176	216	14	6,273	-2	No
Camino del Sur - SR56 EB Ramp (HOV)	1	480	480	135	0	0	0	131	0	0	0	0	No
Black Mountain Road - SR56 EB Ramp	2	600	1,200	773	0	0	0	717	0	0	0	0	No
Black Mountain Road - SR56 EB Ramp (HOV)	1	600	600	86	0	0	0	80	0	0	0	0	No
Rancho Penasquitos - SR56 EB Ramp	2	300	600	198	0	0	0	201	0	0	0	0	No
Carmel Mountain Road - I15 SB Ramp	2	473	946	1,215	269	17	7,801	1,211	265	17	7,671	0	No
Carmel Mountain Road - I15 SB Ramp (HOV)	1	473	473	135	0	0	0	135	0	0	0	0	No
Carmel Mountain Road - I15 NB Ramp	2	463	926	849	0	0	0	846	0	0	0	0	No
Carmel Mountain Road - I15 NB Ramp (HOV)	1	463	463	94	0	0	0	94	0	0	0	0	No
Rancho Penasquitos - I15 SB Ramp - Loop WB->SB	2	576	1,152	1,001	0	0	0	1,003	0	0	0	0	No
Rancho Penasquitos - I15 SB Ramp - EB->SB	2	576	1,152	791	0	0	0	795	0	0	0	0	No
Rancho Penasquitos - I15 NB Ramp - WB->NB	1	335	335	507	172	31	4,988	508	173	31	5,017	0	No
Rancho Penasquitos - I15 NB Ramp - Loop EB->NB	1	335	335	153	0	0	0	154	0	0	0	0	No
Mercy Road - I15 SB Ramp	2	406	812	1,403	591	44	17,142	1,330	518	38	15,028	-6	No
Mercy Road - I15 SB Ramp (HOV)	1	406	406	156	0	0	0	148	0	0	0	0	No
Mercy Road - I15 NB Ramp	2	270	540	1,141	601	67	17,435	1,116	576	64	16,704	-3	No

Source: Caltrans January 2015

Meter rate is based on the most restrictive meter rate provided by Caltrans, see Appendix C

HOV demand is equal to 10% of Total Demand

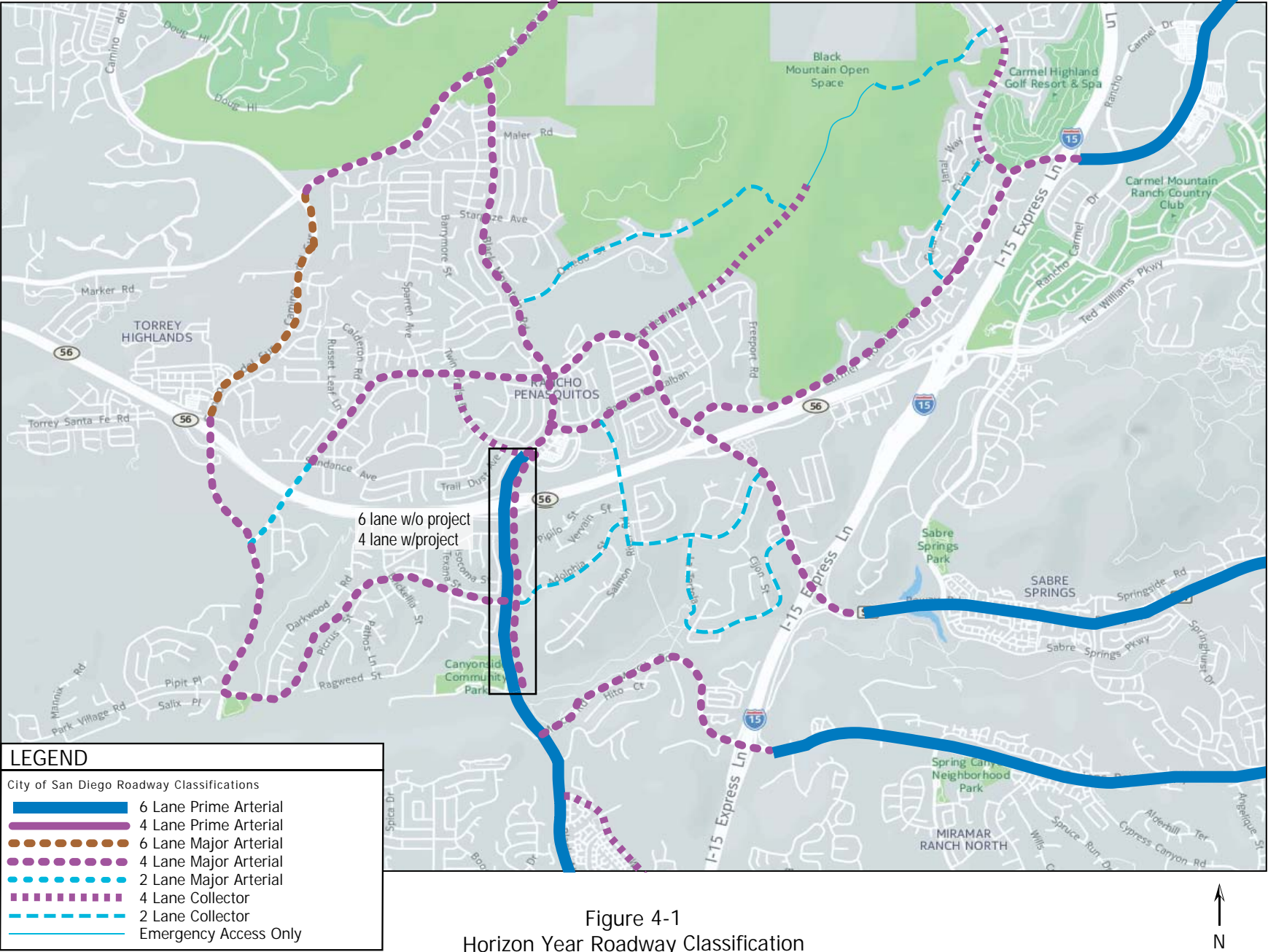
Total Demand onto all lanes of each Freeway Ramp is found in the vehicle turning movements in Figures 4-4 and 4-5

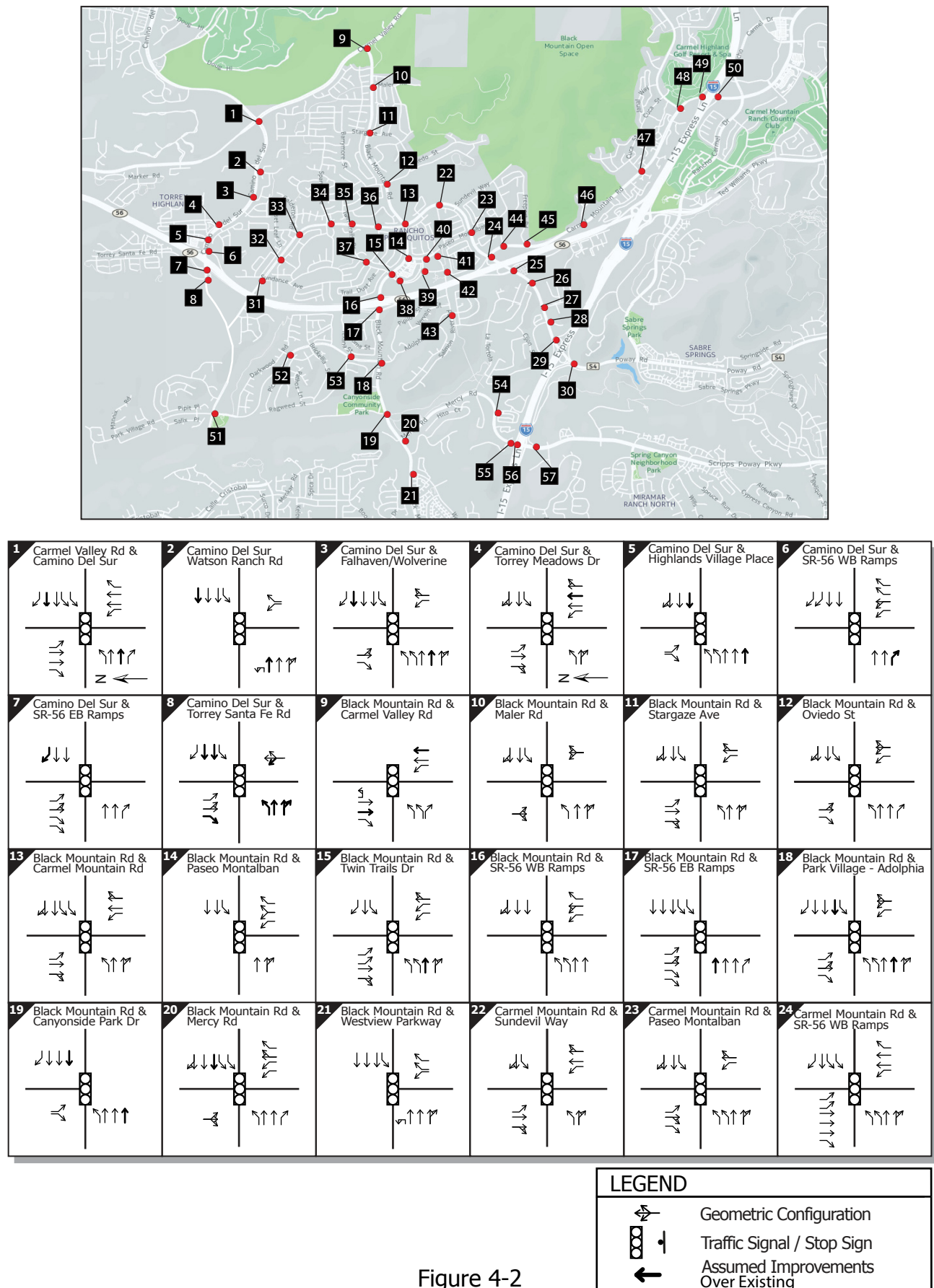
Combined Meter Rate = (Meter Rate per Lane) * (# of Lanes)

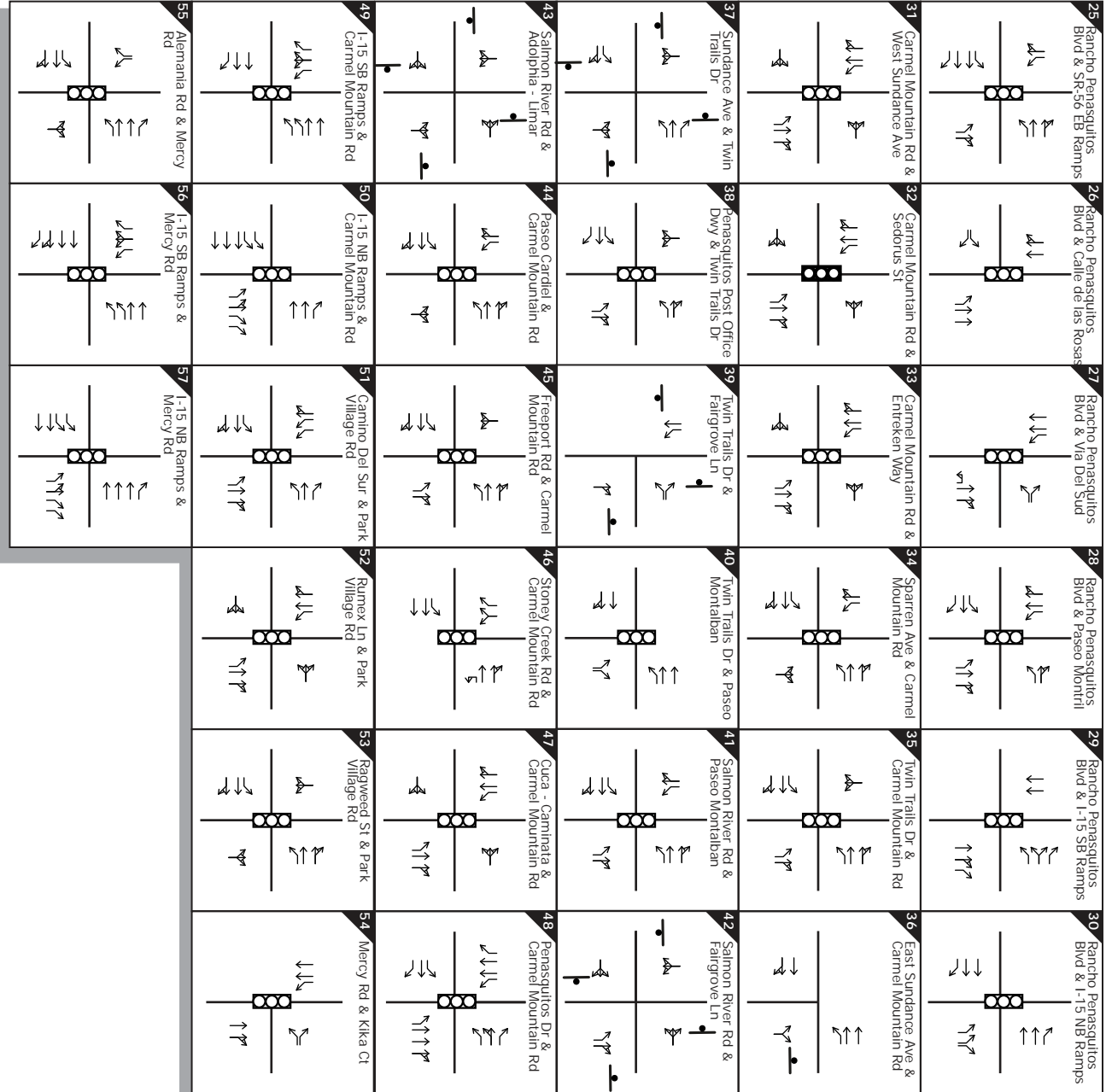
Excess Demand = (Demand * # of lanes) - (Combined Meter Rate); if Excess Demand < 0, then Excess Demand = 0

Delay = Excess Demand / Combined Meter Rate;

Queue = Excess Demand * 29 ft/vehicle







LEGEND

Geometric Configuration

Traffic Signal / Stop Sign

Assumed Improvements Over Existing

Figure 4-2 cont.
Horizon Year Circulation Network

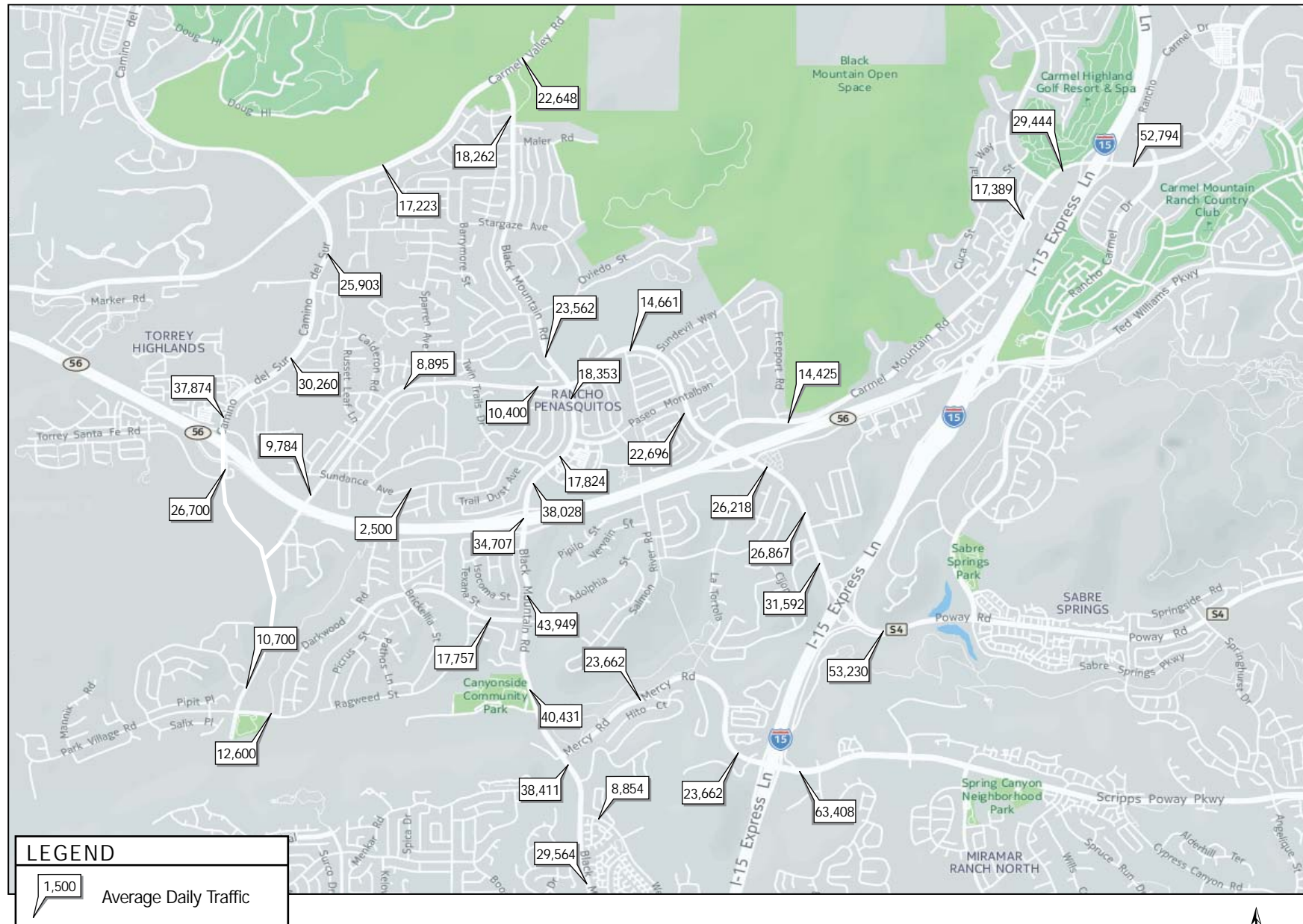


Figure 4-3
Horizon Year Daily Roadway Segment Volumes, Without Project

↑
N
Not To Scale
May 2016

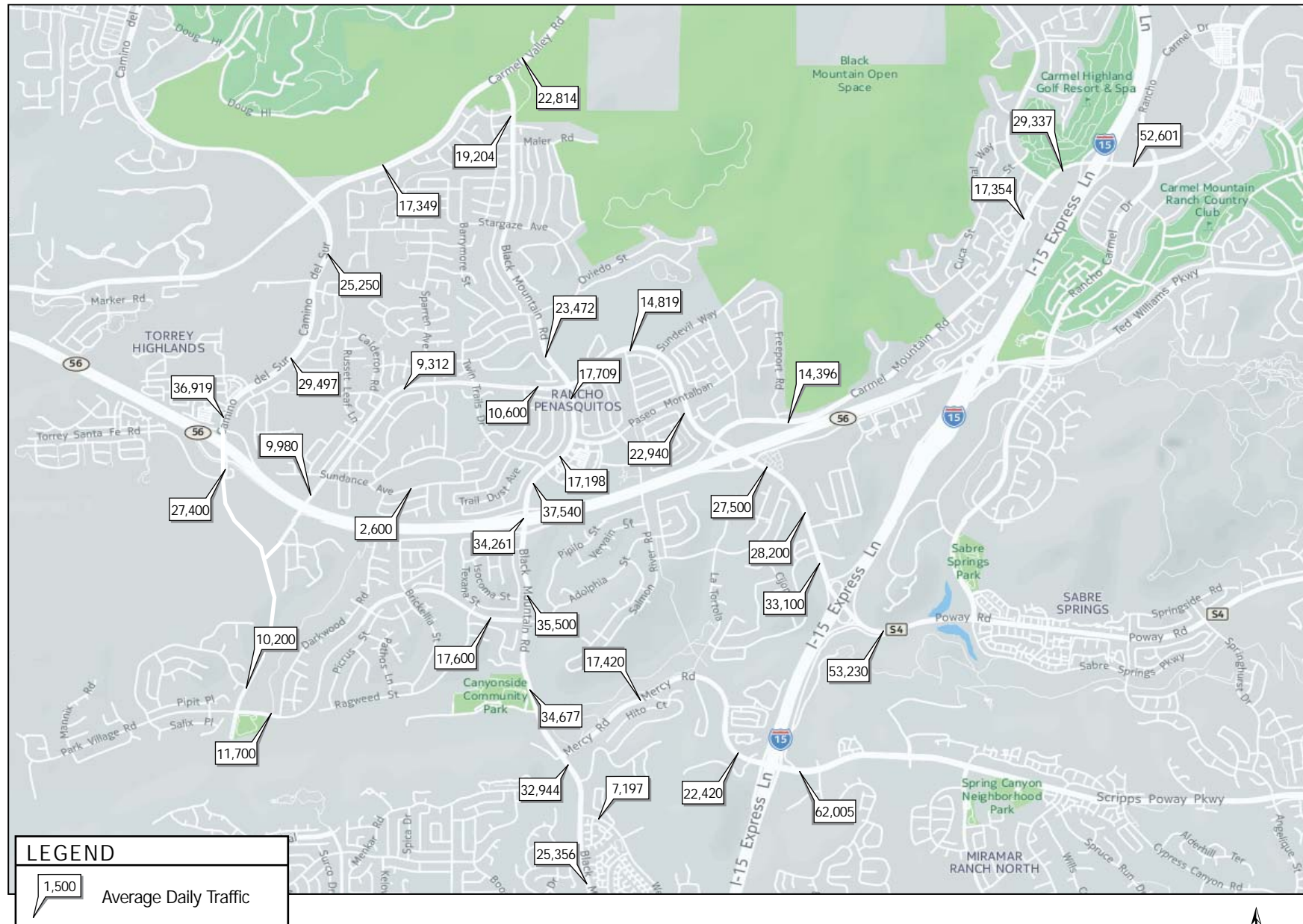

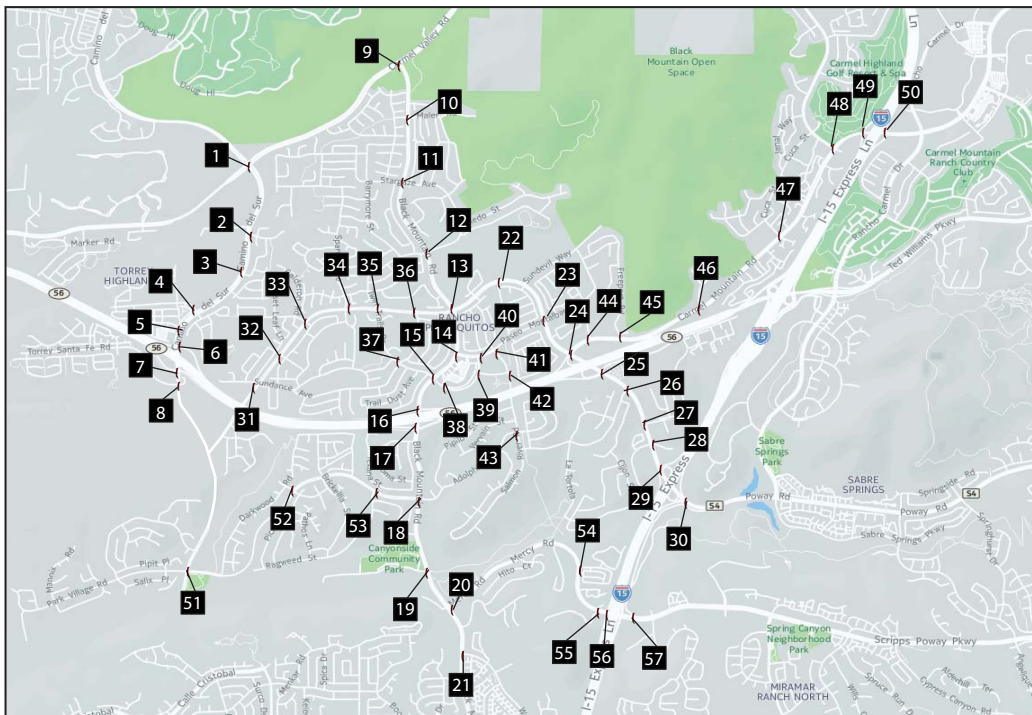


Figure 4-4
Horizon Year Daily Roadway Segment Volumes, With Project


 N
 Not To Scale

 May 2016

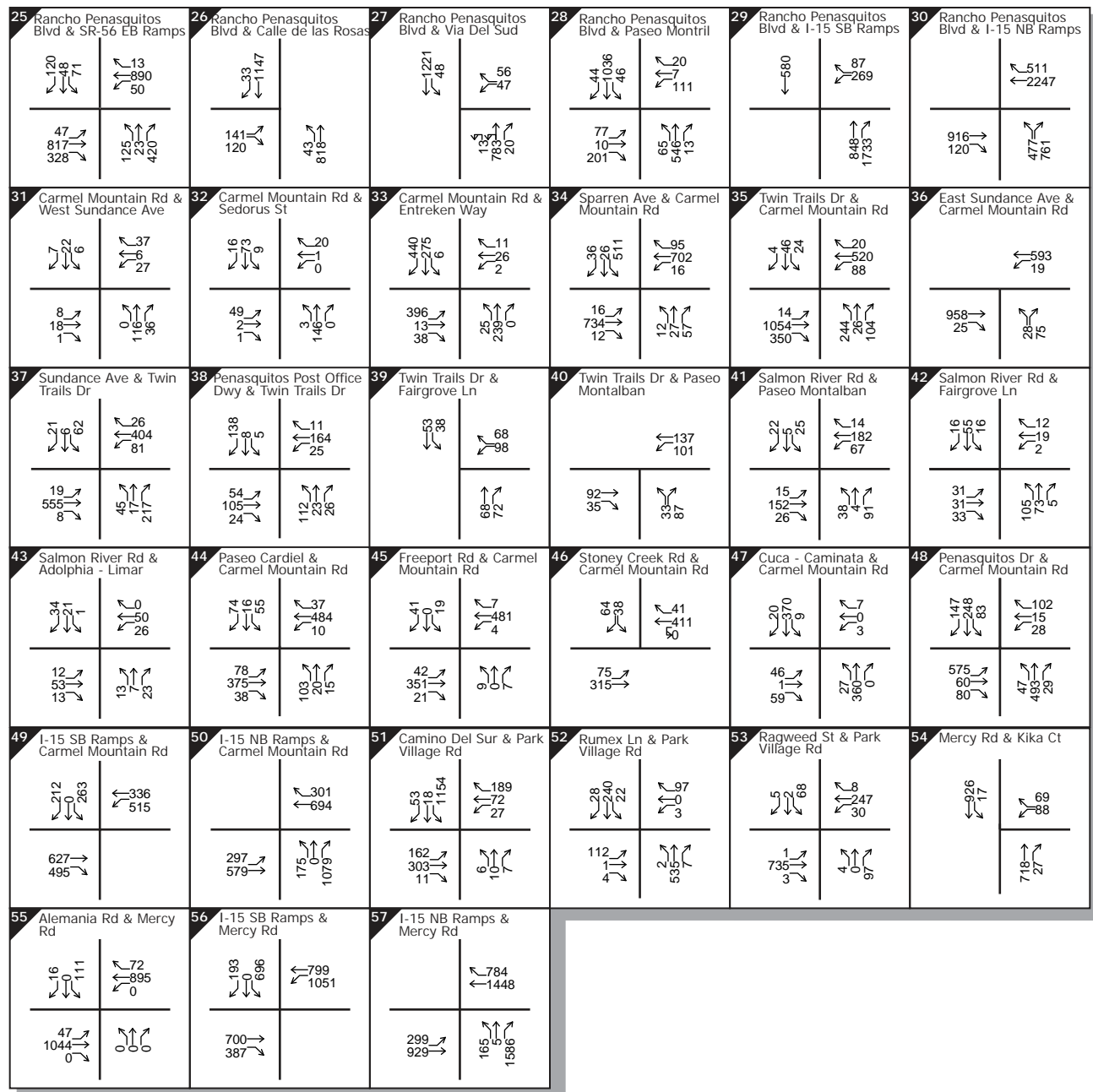


1 Carmel Valley Rd & Camino Del Sur 272, 881, 257, 294, 641, 609, 182, 291, 133, 139, 716, 111	2 Camino Del Sur & Watson Ranch Rd 1276, 27, 26, 27, 1025, 989, 8	3 Camino Del Sur & Falhaven/Wolverine 21, 1055, 48, 17, 86, 14, 53, 300, 1075, 18	4 Camino Del Sur & Torrey Meadows Dr 95, 83, 18, 190, 35, 65, 1310, 68, 89, 2, 29	5 Camino Del Sur & Highlands Village Place 117, 1295, 117, 258, 276, 1396	6 Camino Del Sur & SR-56 WB Ramps 579, 1087, 965, 427, 730, 219
7 Camino Del Sur & SR-56 EB Ramps 720, 719, 250, 382, 699, 245	8 Camino Del Sur & Torrey Santa Fe Rd 675, 468, 108, 79, 13, 20, 298, 75, 138, 56, 21	9 Black Mountain Rd & Carmel Valley Rd 916, 315, 34, 126, 347, 386	10 Black Mountain Rd & Maler Rd 5, 423, 12, 40, 21, 39, 6, 4, 681, 12	11 Black Mountain Rd & Stargaze Ave 16, 436, 7, 32, 43, 81, 109, 31, 527, 17	12 Black Mountain Rd & Oviedo St 692, 13, 22, 82, 33, 12, 102, 42, 537, 46
13 Black Mountain Rd & Carmel Mountain Rd 69, 820, 497, 417, 265, 144, 171, 387, 317, 250, 661, 38	14 Black Mountain Rd & Paseo Montalban 919, 296, 209, 97, 549, 84	15 Black Mountain Rd & Twin Trails Dr 729, 102, 54, 33, 43, 329, 520, 97, 358, 124, 16	16 Black Mountain Rd & SR-56 WB Ramps 924, 1122, 328, 29, 556, 740, 757	17 Black Mountain Rd & SR-56 EB Ramps 1313, 429, 217, 0, 449, 1358, 415	18 Black Mountain Rd & Park Village - Adolphia 248, 1771, 130, 101, 34, 145, 640, 65, 288, 80, 85, 50
19 Black Mountain Rd & Canyonside Park Dr 33, 2573, 8, 1031	20 Black Mountain Rd & Mercy Rd 1817, 508, 319, 460, 23, 701, 374	21 Black Mountain Rd & Westview Parkway 2238, 425, 253, 45, 35, 772, 17	22 Carmel Mountain Rd & Sundevil Way 73, 0, 51, 159, 732, 13, 229, 846, 20, 38, 45	23 Carmel Mountain Rd & Paseo Montalban 8, 894, 50, 44, 55, 85, 54, 56, 354, 157, 844, 23	24 Carmel Mountain Rd & SR-56 WB Ramps 332, 332, 329, 204, 519, 409, 393, 810, 70, 262, 113, 49

LEGEND

10 ↗ AM Peak Hour Traffic

Figure 4-5
Horizon Year AM Peak Hour Intersection Volumes, Without Project



LEGEND

10 AM Peak Hour Traffic

Figure 4-5 cont.
Horizon Year AM Peak Hour Intersection Volumes, Without Project

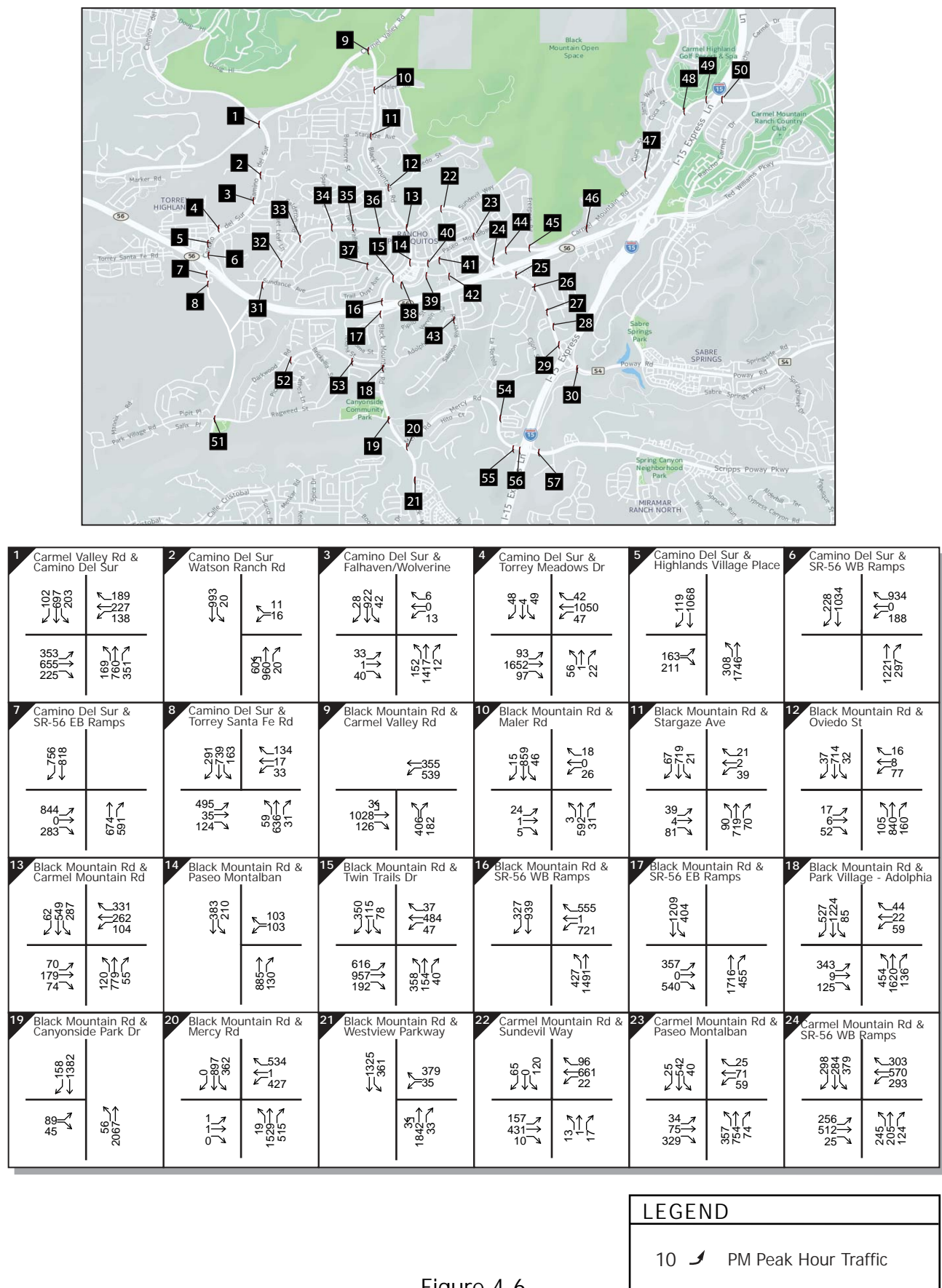
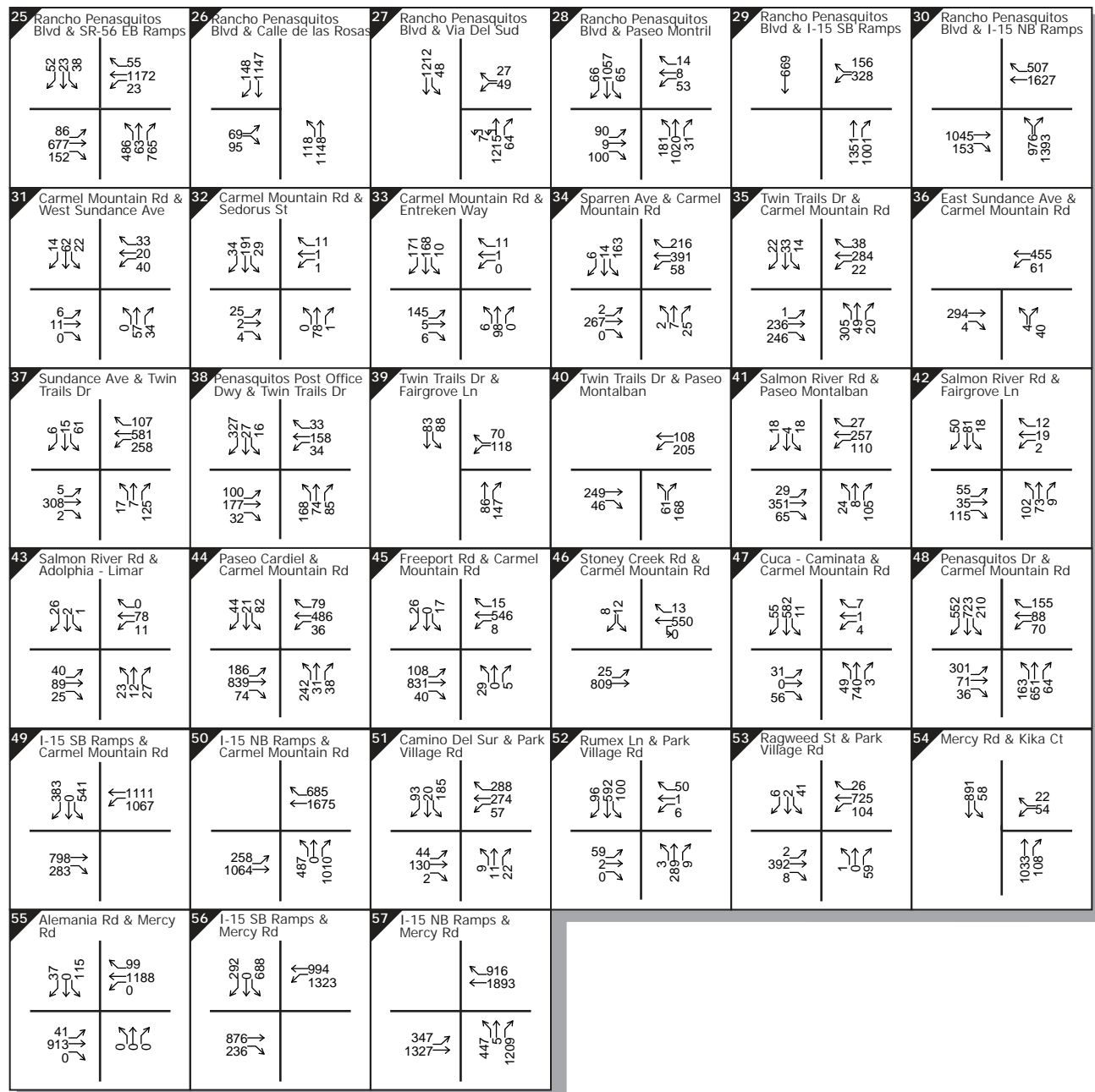


Figure 4-6
Horizon Year PM Peak Hour Intersection Volumes, Without Project



LEGEND

10 PM Peak Hour Traffic

Figure 4-6 cont.
Horizon Year PM Peak Hour Intersection Volumes, Without Project

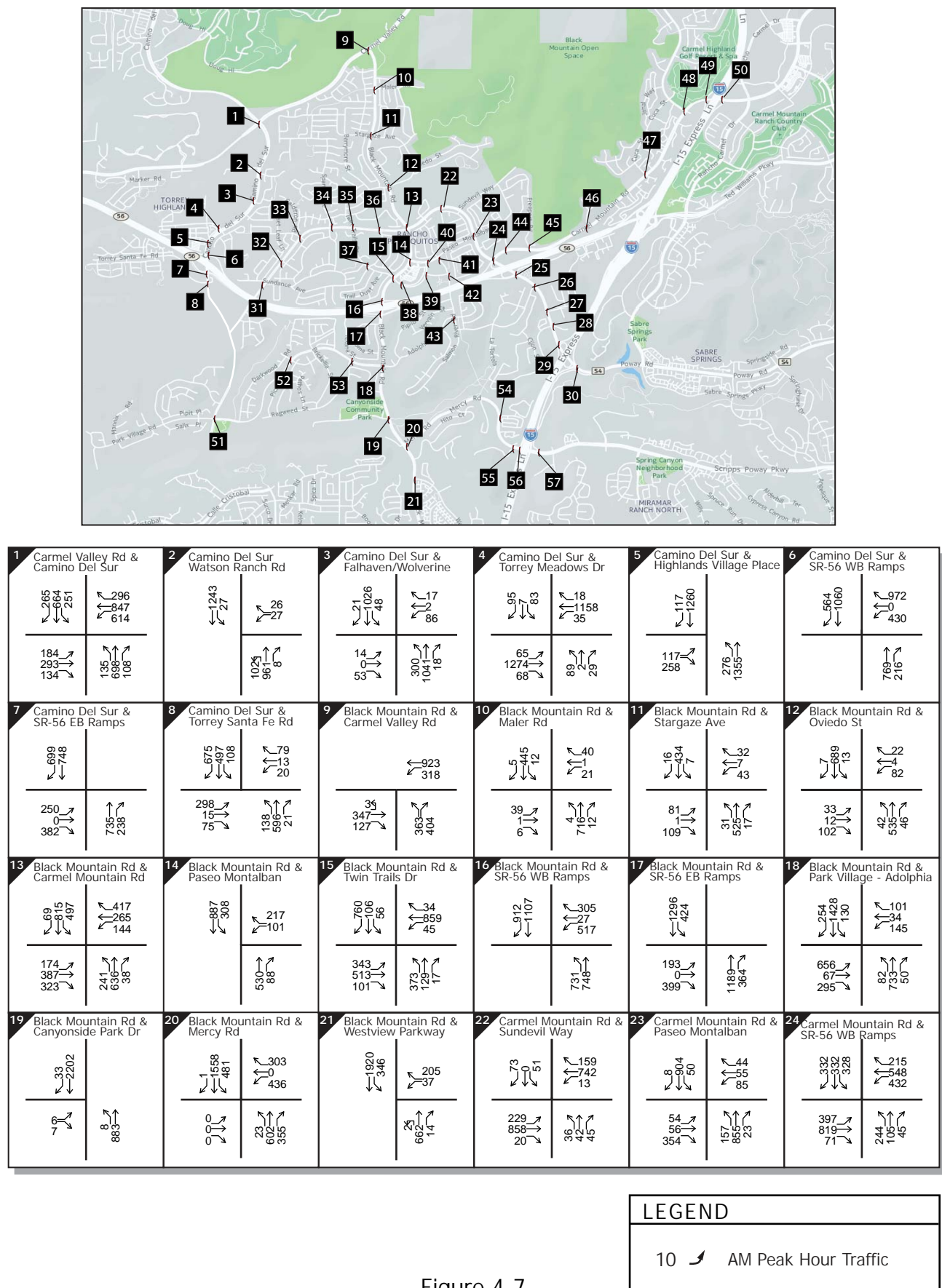


Figure 4-7
Horizon Year AM Peak Hour Intersection Volumes, With Project

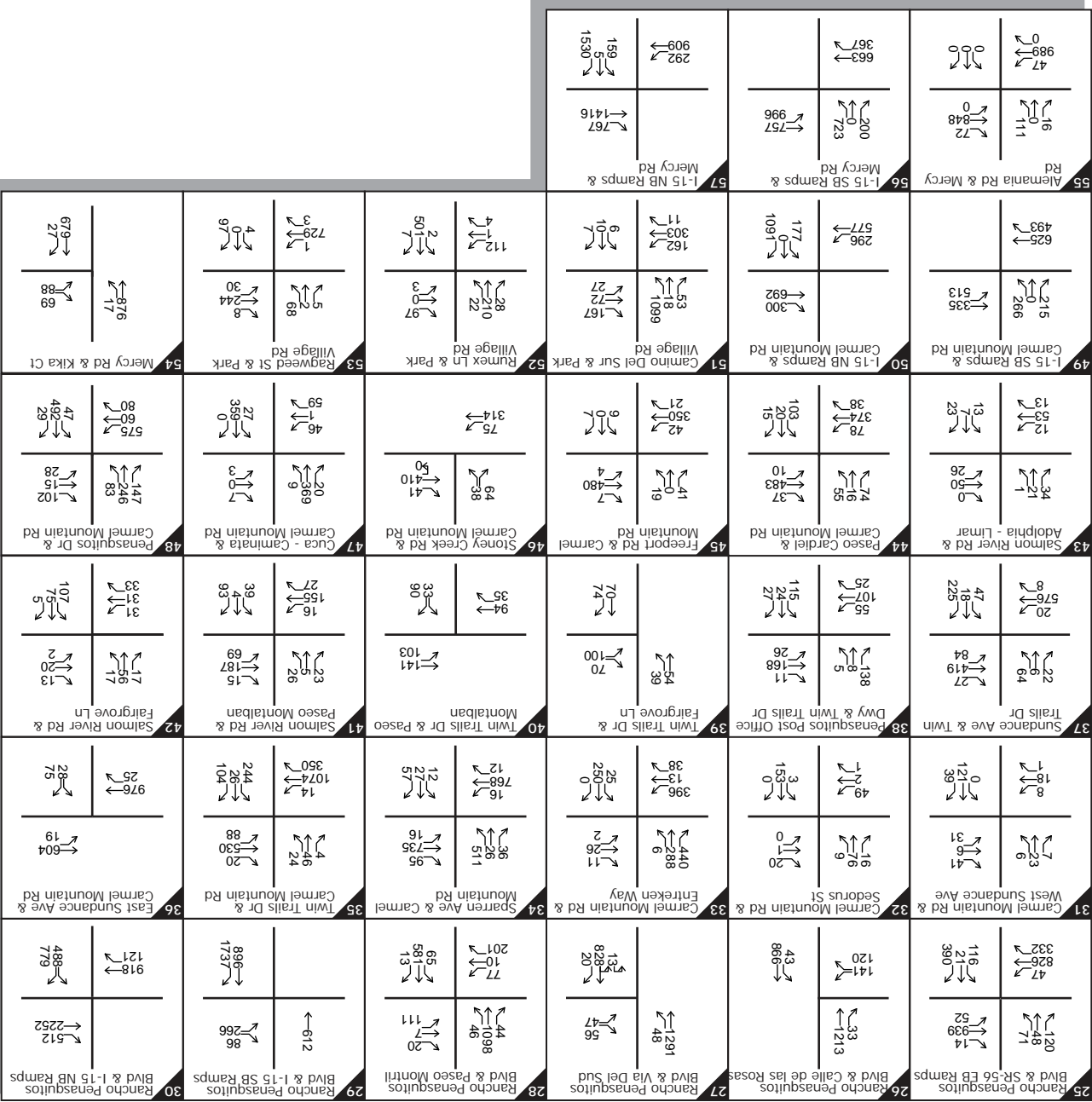


Figure 4-7 cont.
Horizon Year AM Peak Hour Intersection Volumes, With Project

LEGEND
10 AM Peak Hour Traffic

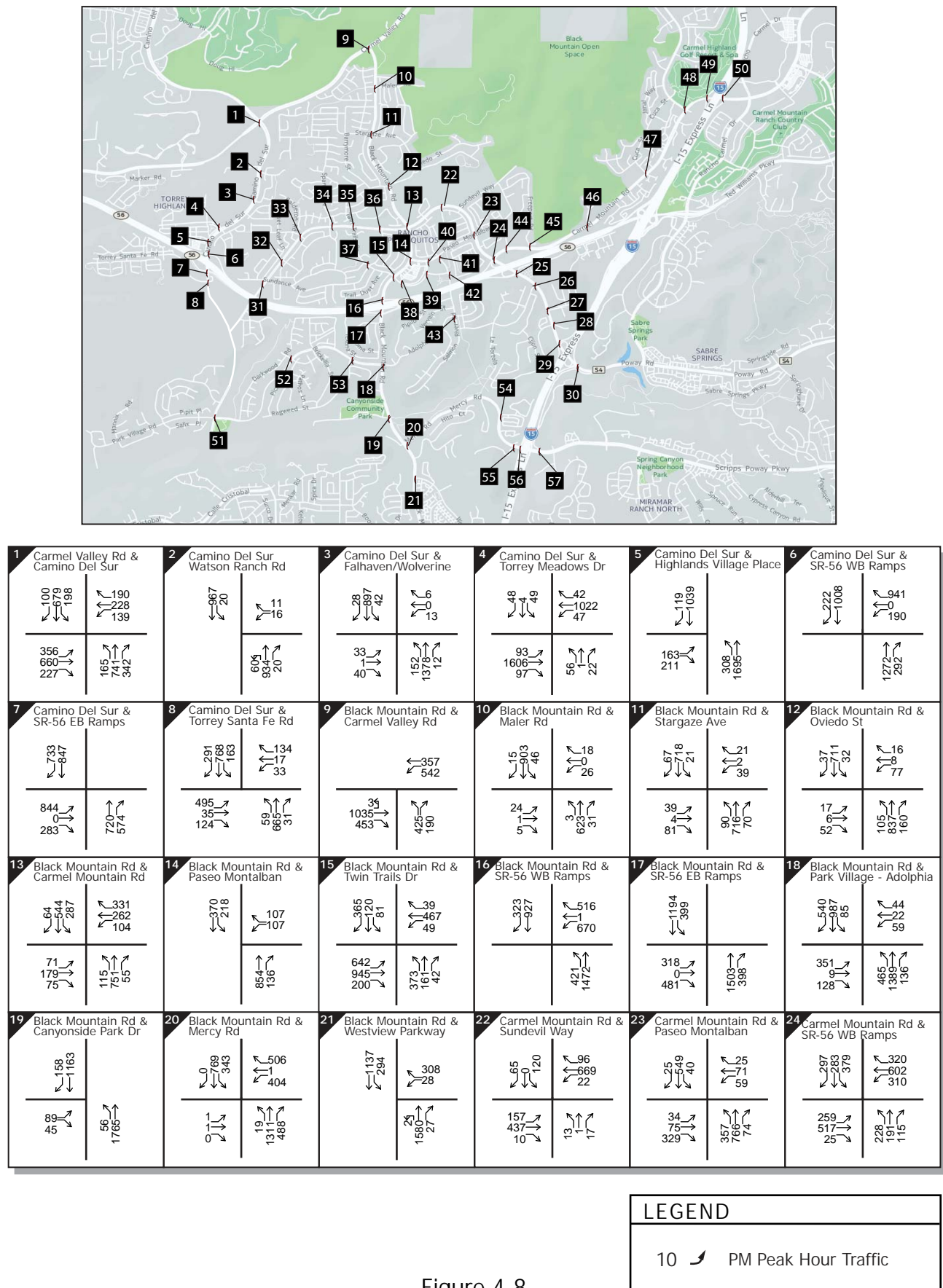


Figure 4-8
Horizon Year PM Peak Hour Intersection Volumes, With Project



LEGEND

10 ↗ PM Peak Hour Traffic

Figure 4-8 cont.
Horizon Year PM Peak Hour Intersection Volumes, With Project



Figure 4-9
Project Impacts and Mitigation Locations

CHAPTER 5

TRANSIT, PEDESTRIAN AND BICYCLE FACILITIES

As aforementioned, the Project is the reclassification of Black Mountain Road to a 4-Lane Major from Twin Trails Drive to the southern community boundary of Rancho Peñasquitos. As the Project is not a conventional site-based development, an assessment of parking and on-site circulation conditions was not included.

TRANSIT FACILITIES

Transit service within the Rancho Peñasquitos community is limited to its eastern portion. Currently, the community is served by San Diego Metropolitan Transit System's Line 20 bus route. Line 20 runs from downtown San Diego, up I-15, and exits onto Rancho Peñasquitos Boulevard, where it travels northward to Carmel Mountain Road. Line 20 then turns right onto Carmel Mountain Road and continues to the northeast, beyond the Rancho Peñasquitos community boundary. Line 20 operates 7 days a week with modified schedules on Saturday and Sunday. The shortest headway is 30 minutes for Line 20. The longest headway observed for Line 20 is 60 minutes over Saturday and Sunday.

On the eastern periphery of the Rancho Peñasquitos community, Sabre Springs/Peñasquitos Transit Station is located near the I-15/SR-56 junction and provides express bus service along the I-15 corridor with connections to downtown San Diego and the City of Escondido. Express bus lines that stop at this station include Line 235, Line 290, and Line 944. Lines 235 and 944 have headways of 30 minutes. Line 290 has a headway of 10 minutes. Route information on routes 20, 235, 290 and 944 can be found in Appendix M.

No transit lines traverse the subject section of Black Mountain Road. The Rancho Peñasquitos Community Plan discusses a desire for future intra-community transit services but recognizes that funding for these services may not be available. The community plan does not indicate any particular routes or destinations to be served. Therefore, implementation of the Project poses no impact to transit services.

PEDESTRIAN FACILITIES

Sidewalks are provided throughout the Rancho Peñasquitos community along nearly all local, collector and major roadways. Black Mountain Road, including the subject segment between Twin Trails Drive and the southern community boundary, provides sidewalks and pedestrian links between neighborhoods and commercial areas. Should Black Mountain Road be widened pedestrian facilities would be upgraded to current standards for non-contiguous sidewalks.

BICYCLE FACILITIES

Class I bike paths are present in multiple areas of the community and serve as both recreational facilities and routes between neighborhoods. Class II bike lanes are present along many of the Major and Primary roadways within the community, including Camino Del Sur, Black Mountain Road, Carmel Valley Road, Carmel Mountain Road, Paseo Montalban, and Mercy Road. For additional bicycle facility details, refer to Appendix L for the City of San Diego Existing Bikeways and Proposed Bikeways maps.

The Rancho Peñasquitos Community Plan recommends that all of its major streets have Class II bike lanes, with on-street parking prohibited where possible. Black Mountain Road, including the subject segment between Twin Trails Drive and the southern community boundary, is consistent in this regard, as it has Class II bike lanes in each direction and no on-street parking. Implementation of the Project would maintain the existing bike lanes along Black Mountain Road.

CHAPTER 6 IMPACTS AND MITIGATIONS

As discussed in Chapter 4, future significant traffic impacts due to volume changes associated with the Project, are projected for two street segments, one intersection, a freeway mainline segment and a metered freeway on-ramp.

SIGNIFICANT IMPACTS

One significant intersection impact was identified within the study area. To mitigate this significant impact during the AM peak hour at the intersection of Sundance Avenue and Twin Trails Drive, a traffic signal is recommended to replace the all-way stop control. See Table 6-1 for the change in delay and LOS as a result of this mitigation strategy. See Appendices H and J for the LOS and signal warrant analysis for this intersection. This mitigation is not found in any PFFP or Regional Plan. Partial mitigation may be provided by modifying the PFFPs of those communities currently providing funding for the widening of Black Mountain Road to substitute this mitigation for the widening project currently included in those PFFPs. See Appendix O for potential PFFP modifications to project T-11.1 of the Pacific Highlands, project T-57 of the Black Mountain Ranch, and project T-2D of Rancho Penasquitos plans.

One significant freeway mainline impacts were found within the study area. The freeway mainline significant impact was found in the PM peak hour on eastbound SR-56 between Camino del Sur and Black Mountain Road. Mitigation can be achieved by constructing an additional lane between Camino del Sur and Black Mountain Road. The construction location for this mitigation improvement can be found in Appendix K. This mitigation is not found in any PFFP, Regional or Caltrans Plan. Partial mitigation may be provided by modifying the PFFPs of those communities currently providing funding for the widening of Black Mountain Road to substitute this mitigation for the widening project currently included in those PFFPs. See Appendix O for potential PFFP modifications to the aforementioned plans.

One significant ramp metering delay impact was also found within the study area. In the AM peak hour, the Rancho Penasquitos Blvd – SR56 WB on-ramp experiences an increase in delay of 3 minutes from about 21 minutes to 24 minutes, resulting in a significant impact. Mitigation can be achieved by constructing an additional on-ramp lane at this location. See Appendix K for the construction location for this mitigation improvement. This mitigation is not found in any PFFP, Regional or Caltrans Plan. Partial mitigation may be provided by modifying the PFFPs of those communities currently providing funding for the widening of Black Mountain Road to substitute this mitigation for the widening project currently included in those PFFPs. See Appendix O for potential PFFP modifications to the aforementioned plans.

**Table 6-1
Mitigation Summary**

Impact Type	Location	Peak Hour	2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		2050 W/ Project (With Mitigation)	
			Delay or V/C	LOS	Delay or V/C	LOS	Delay or V/C	LOS
Intersection	Sundance Avenue/Twin Trails Drive <i>(All-way stop control)</i>	AM	38.8 s	E	46.4 s	E	7.8 s	A ¹
Freeway Mainline	Eastbound SR-56 from Camino del Sur to Black Mountain Rd	PM	1.098	E	1.104	E	0.879	D ²
Ramp Meter	SR-56 Westbound On-Ramp at Rancho Penasquitos Blvd	AM	21 min	N/A	24 min	N/A	No Delay	N/A ³

¹ Mitigation achieved by installing traffic signal in place of All Way Stop. See Signal Warrant Analysis in Appendix J.

² Mitigation achieved by constructing freeway lane along the impacted segment. See construction location in Appendix K.

³ Mitigation achieved by constructing additional on-ramp lane. See construction location in Appendix K.

ADDITIONAL PROJECT EFFECTS

Significant segment impacts were identified at Black Mountain Road south of Twin Trails Drive and Black Mountain Road north of Park Village Road-Adolphia Street. If the Project was implemented, Black Mountain Road would maintain the classification of a 4-Lane Major and these segments would remain significantly impacted, operating at LOS E with volumes slightly less than its 40,000 ADT capacity. This is the nature of the project and as such, no mitigation is proposed.

CHAPTER 7 RECOMMENDATIONS

In addition to the mitigation measures discussed in Chapter 6, there is one location that this traffic study recommends improvements that could benefit traffic flow through the community. This recommendation is not proposed as mitigation for any impacts and is simply a recommendation that could be further analyzed in the future for potential implementation.

Along Black Mountain Road, it is recommended that the segment between the SR-56 westbound and eastbound ramps be restriped. (See Table 7-1) Using the available excess width on the bridge, this segment can be restriped to provide side-by-side left-turn pockets. This would increase the storage capacity for the northbound-to-westbound left-turn and the southbound-to-eastbound left-turn movements. To accommodate the offsets from this restriping, the roadway will need to be widened for NB traffic north of the bridge to accommodate a transition taper. A conceptual drawing of this strategy can be found in Appendix K.

**Table 7-1
Intersection Delay/LOS**

Location	Peak Hour	2050 W/O Project (BMR as 6 Lanes)		2050 W/ Project (BMR as 4 Lanes)		2050 W/ Restriping	
		Delay	LOS	Delay	LOS	Delay	LOS
#16 Black Mountain Road / SR56 - WB Ramps	AM	47.3	D	45.0	D	45.0	D
	PM	34.4	C	34.7	C	34.7	C
#17 Black Mountain Road / SR56 - EB Ramps	AM	22.4	C	23.1	C	21.6	C
	PM	26.1	C	26.2	C	23.6	C

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