CITY OF RANCHO PALOS VERDES

GENERAL PLAN CIRCULATION ELEMENT UPDATE

TRAFFIC IMPACT ANALYSIS

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July 19, 2010 ***DRAFT***

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CITY OF RANCHO PALOS VERDES
GENERAL PLAN CIRCULATION ELEMENT UPDATE
TRAFFIC IMPACT ANALYSIS

I. INTRODUCTION

Project Description

This report, prepared by Willdan Engineering, provides a summary of the traffic impact analysis (TIA) for the update of the City of Rancho Palos Verdes General Plan Circulation Element. ***Exhibit 1*** is a vicinity map of the Palos Verdes Peninsula. The study area is shown on ***Exhibit 2***. The traffic analysis provides a nexus between the Land Use and Circulation elements of the General Plan since by determining the required roadways and intersection geometries that will be needed at General Plan Buildout in 2035 to meet the needs of the planned land uses.

Study Area Roadway Segments and Intersections

The traffic impact analysis includes the review of the 28 study roadway segments and 22 study intersections listed below and illustrated on ***Exhibits 3*** and ***4****, respectively*.

Study Roadway Segments

Crenshaw Boulevard

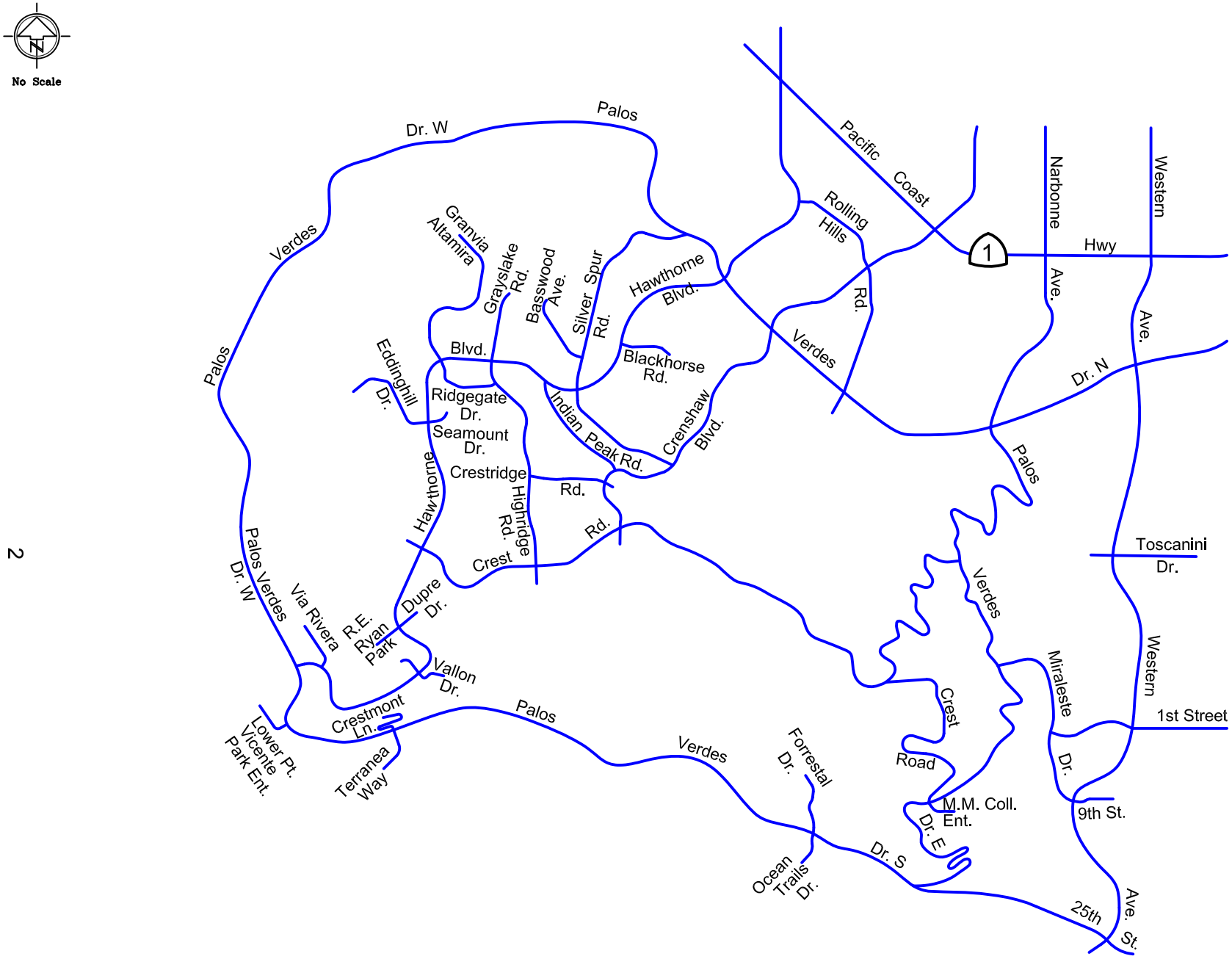
- Between the North City Limit and Indian Peak Road
- Between Indian Peak Road and Crest Road

Crest Road

- Between Hawthorne Boulevard and Crenshaw Boulevard
- Between Palos Verdes Drive East and Ganado Drive

Crestridge Road

- Between Highridge Road and Crenshaw Boulevard



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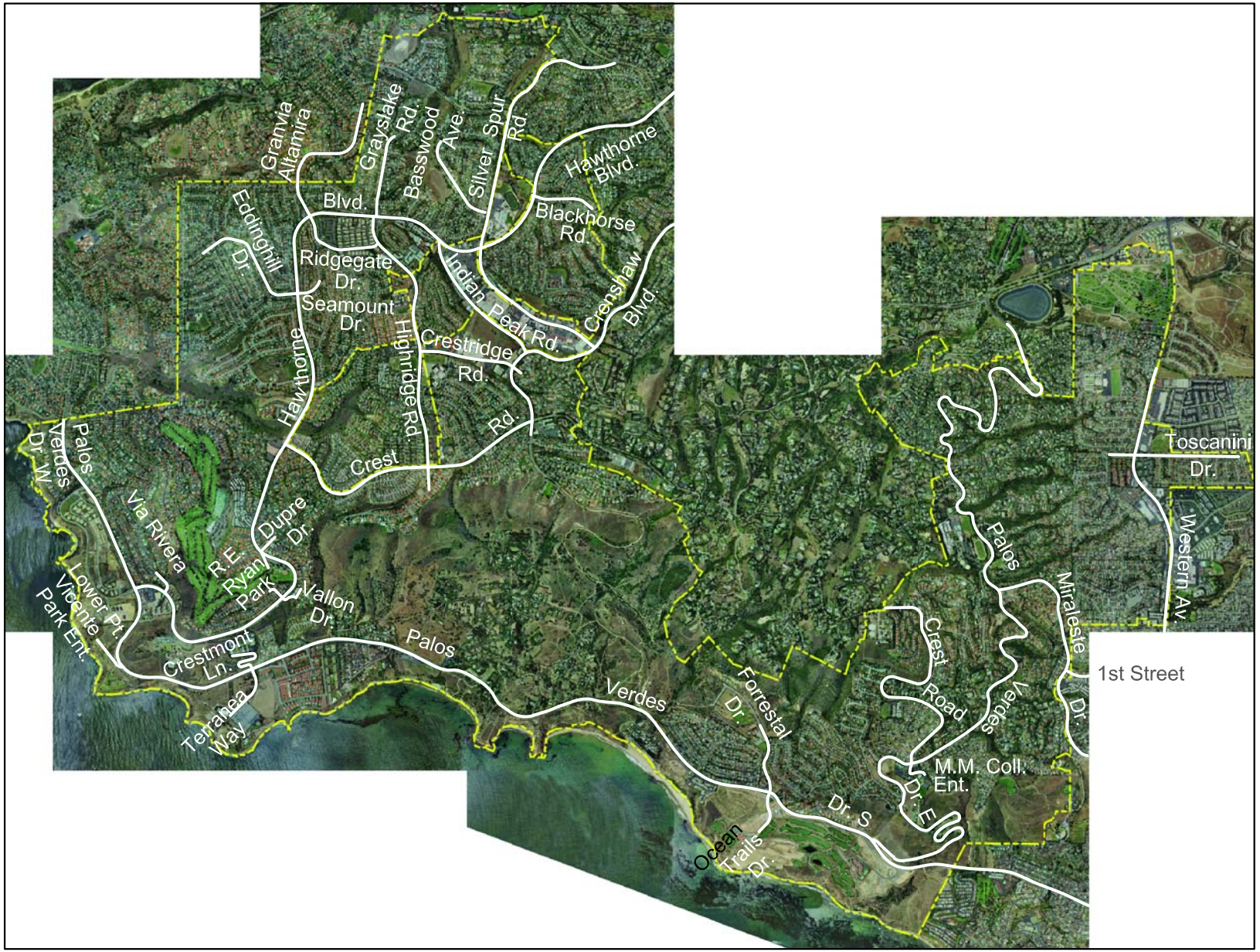
Vicinity Map
EXHIBIT 1



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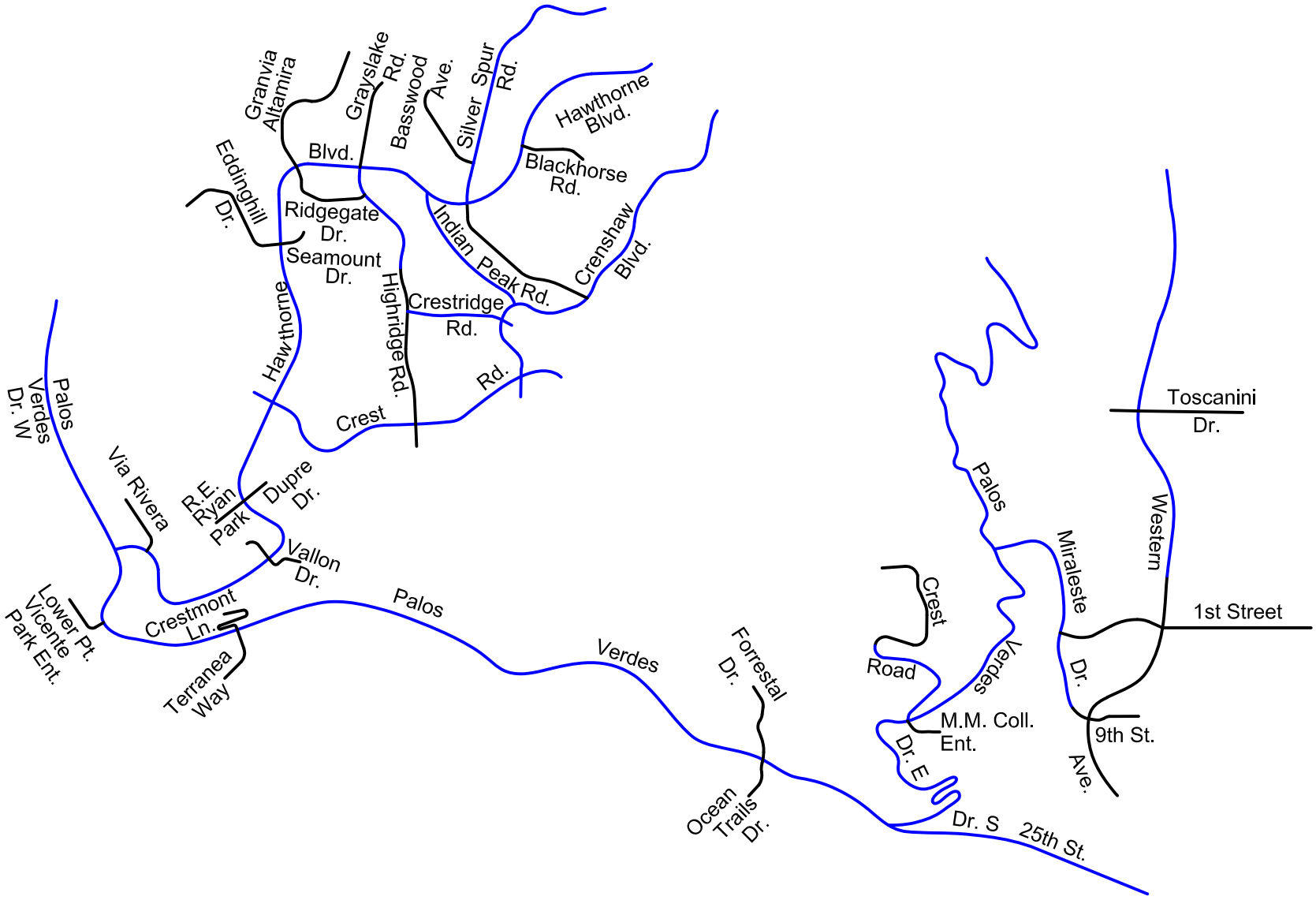
= RANCHO PALOS VERDES CITY BOUNDARY

Study Area Map
EXHIBIT 2



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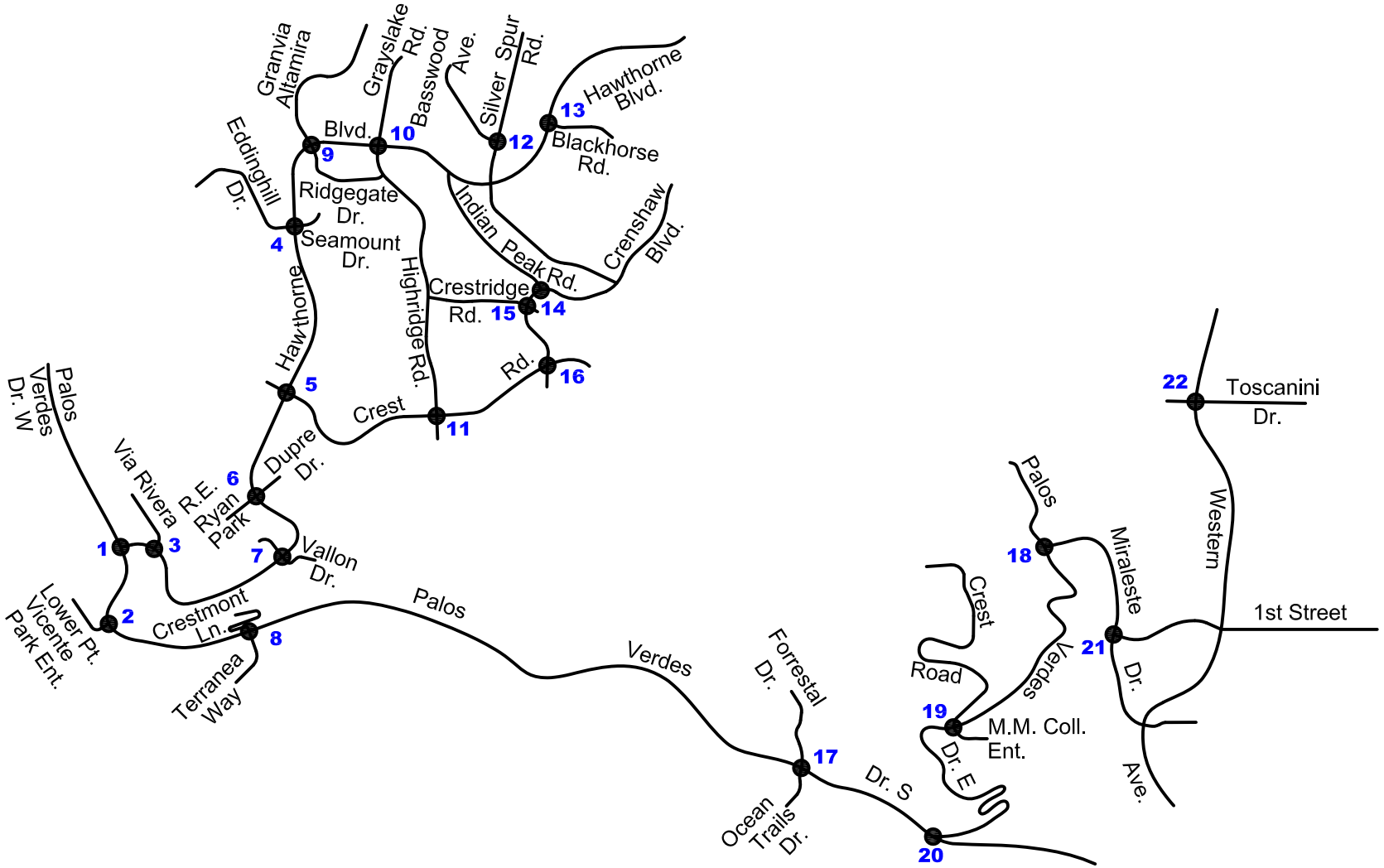
= STUDY AREA ROADWAY SEGEMENT

Study Area Roadway Segments
EXHIBIT 3



LEGEND

● = STUDY INTERSECTION

23 = INTERSECTION NUMBER

Study Area Intersections
EXHIBIT 4

Hawthorne Boulevard

- Between the North City Limit and Blackhorse Road
- Between Blackhorse Road and Indian Peak Road
- Between Indian Peak Road and Grayslake Road/Highridge Road
- Between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive
- Between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive
- Between Eddinghill Drive/Seamount Drive and Crest Road
- Between Crest Road and Vallon Drive
- Between Vallon Drive and Palos Verdes Drive West

Highridge Road

- Between Hawthorne Boulevard and the City Limit with Rolling Hills Estates

Indian Peak Road

- Between Crenshaw Boulevard and the City Limit with Rolling Hills Estates

Miraleste Drive

- Between Palos Verdes Drive East and1st Street
- Between 1st Street and the East City Limit at 9th Street

Palos Verdes Drive East

- Between the North City Limit and Miraleste Drive
- Between Miraleste Drive and North of Crest Road
- Between North of Crest Road and Ganado Drive
- Between Ganado Drive and Palos Verdes Drive South

Palos Verdes Drive South

- Between Palos Verdes Drive West and Crestmont Lane/Terranea Way
- Between Crestmont Lane/Terranea Way and Forrestal Drive/Ocean Trails Drive
- Between Forrestal Drive/Ocean Trails Drive and Palos Verdes Drive East
- Between Palos Verdes Drive East and the East City Limit

Palos Verdes Drive West

- Between the North City Limit and Hawthorne Boulevard

Silver Spur Road

- Between the North City Limit and just north of Hawthorne Boulevard
- Between Hawthorne Boulevard and Palos Verdes Drive South

Western Avenue

- Between the North City Limit and the South City Limit

Study Intersections

1. Palos Verdes Drive West (NS)/Hawthorne Boulevard (EW)
2. Palos Verdes Drive West (NS)/Lower Point Vicente Park Entrance (EW)
3. Via Rivera (NS)/Hawthorne Boulevard (EW)
4. Hawthorne Boulevard (NS)/Eddinghill Drive – Seamount Drive
5. Hawthorne Boulevard (NS)/ Crest Road
6. Hawthorne Boulevard (NS)/Dupre Drive – R. E. Ryan Park Driveway (EW)
7. Hawthorne Boulevard (NS)/Vallon Drive (EW)
8. Crestmont Lane – Terranea Way (NS)/Palos Verdes Drive South
9. Gravania Altamira – Ridgegate Drive (NS)/Hawthorne Boulevard (EW)
10. Grayslake Road – Highridge Road (NS)/Hawthorne Boulevard
11. Highridge Road (NS)/Crest Road
12. Silver Spur Road (NS)/Hawthorne Boulevard (EW)
13. Hawthorne Boulevard (NS)/Blackhorse Road (EW)
14. Crenshaw Boulevard (NS)/Indian Peak Road (EW)
15. Crenshaw Boulevard (NS)/Crestridge Road (EW)
16. Crenshaw Boulevard (NS)/Crest Road (EW)
17. Forrestal Drive – Ocean Trails Drive (NS)/Palos Verdes Drive South (EW)
18. Palos Verdes Drive East (NS)/Miraleste Drive (EW)
19. Palos Verdes Drive East (NS)/Crest Road – Marymount College Driveway (EW)
20. Palos Verdes Drive East (NS)/Palos Verdes Drive South (EW)
21. Miraleste Drive (NS)/1st Street (EW)
22. Western Avenue (NS)/Toscanini Drive (EW)

Related Projects

Due to the close proximity of the cities of Rolling Hills Estates and Los Angeles to the City of Rancho Palos Verdes, proposed and approved development projects within these cities that would be likely to contribute traffic to the study intersections were included in the analysis. These projects, in addition to similar projects in the City of Rancho Palos Verdes, form the basis for the related projects list shown in Section III.

Vacant Parcels

The build-out of the General Plan also includes all developable vacant parcels. To account for these parcels, the City generated a map of vacant, developable parcels, and the trips that each parcel would generate were estimated based on its land use. A more detailed discussion of the vacant parcels is included in Section III.

Analysis Scenarios

The traffic analysis evaluated the traffic operating conditions for the following scenarios:

- Existing Conditions
- 2035 General Plan Buildout Conditions With Planned Improvements
- 2035 General Plan Buildout Conditions With Additional Improvements

The 2035 General Plan Buildout conditions were estimated using build-up methodology where an ambient growth factor was applied to existing traffic volumes and trips from related projects and vacant parcels were added to the total.

Traffic Analysis Methodologies

Intersection Analysis Methodologies

The Intersection Capacity Utilization (ICU) method was used to analyze the Level of Service (LOS) for signalized intersections and the 2000 *Highway Capacity Manual* (HCM) methodology was used for unsignalized intersections.

For signalized intersections, an ICU value is calculated based upon a comparison of peak hour intersection volumes to available roadway capacity for the critical intersection movements. The ICU values are then related to Levels of Service (LOS), which are qualitative descriptions of intersection operations and can range from "A" (the best level) to "F" (the worst). The City of Rancho Palos Verdes generally considers LOS A through D to represent acceptable intersection operations, while LOS E and F indicate a congested (unacceptable) situation. A more detailed explanation of ICU and its relationship to LOS is contained in ***Appendix A***.

The 2000 *Highway Capacity Manual* (HCM) methodology was utilized to analyze the unsignalized intersections. For both of these intersection analysis methods, the operating conditions are defined in terms of Levels of Service (LOS). The Levels of Service are described using letter "grades", which are associated with vehicle delay times, where "A" is considered the best and "F" is over capacity. As with the ICU methodology, the City of Rancho Palos Verdes generally considers LOS A through D to represent acceptable intersection operations, while LOS E and F indicate a congested (unacceptable) situation. An explanation of Level of Service as it relates to vehicle delay for the 2000 HCM analysis is provided in ***Appendix B***.

The 2035 General Plan Buildout analysis assumed that certain planned improvements by the City (identified in Section IV) would be implemented by 2035. Any study intersections that were anticipated to operate LOS E or F in 2035 were considered to be deficient and additional improvements to improve the intersection LOS to D or better were determined.

Daily Traffic Analysis Methodology

The Orange County Transportation Authority's (OCTA) Road Capacity Values shown in Table A-4-2: Arterial Highways, from their Roadway Design Standards (***Appendix C***), were used to determine the roadway levels of service based on daily traffic volumes. The maximum average daily traffic Roadway Capacity Values are given for each type of roadway at each level of service. The standards note that the average daily traffic roadway capacities are approximate values only and are used at the General Plan level to assist in

determining the arterial highway classification (number of through lanes) needed to meet traffic demand. They also note that the capacities are affected by such factors as intersections, degree of access control, roadway grades, design geometrics, sight distance, levels of truck and bus traffic and levels of pedestrian and bicycle traffic.

Roadway capacities for 2 Lane Divided roads were derived from 4 Lane Divided roads, since the OCTA table does not include the 2 Lane Divided classification. A comparison of the table's capacities indicated that those for 2 Lane Divided are half of the 4 Lane Divided. Accordingly, the 2 Lane Divided capacities shown are half of the 4 Lane Divided capacities. OCTA's modified Road Capacity Table A-4-2 is shown below.

Modified Table A-4-2: Arterial Highways

	LEVEL OF SERVICE					
TYPE OF ARTERIAL	**A**	**B**	**C**	**D**	**E**	**F**
8 Lanes Divided (8D)	45,000	52,500	60,000	67,500	75,000	--
6 Lanes Divided (6D)	33,900	39,400	45,000	50,600	56,300	--
4 Lanes Divided (4D)	22,500	26,300	30,000	33,800	37,500	--
4 Lanes Undivided (UD)	15,000	17,500	20,000	22,500	25,000	--
2 Lanes Divided (2D)	11,300	13,200	15,000	16,900	18,800	--
2 Lanes Undivided (2U)	7,500	8,800	10,000	11,300	12,500	--

Congestion Management Program (CMP) Intersection

One intersection, at Western Avenue and Toscanini, is included in the County of Los Angeles' Congestion Management Program. Since the intersection is projected to operate at acceptable levels of service in 2035, no further analysis is needed.

Planned Improvements

A number of roadway and intersection improvements are planned by the City and by others, that would be implemented by General Plan Buildout in 2035. ***Table 1*** lists these planned improvements.

TABLE 1

PLANNED INTERSECTION AND ROADWAY IMPROVEMENTS

IMPROVE-MENT NO.	IMPROVEMENT LOCATION	IMPROVEMENT DESCRIPTION	RESPONSIBLE ENTITY
1	PVDS/PVDE	Modify the intersection to provide a 2-stage gap acceptance design for southbound left-turning vehicles,including median refuge area and acceleration lane.	City of Rancho Palos Verdes with contributions from Marymount College & The Annenberg Project at Lower Point Vicente
2	PVDE/Miraleste Dr.	Install new traffic signal with westbound right turn overlap phasing	Marymount College (mitigation measures) & City of Rancho Palos Verdes
3	PVDW/PVDS at Lower Point Vicente Park entrance	Modify the existing access by removing the skewed approach & creating a 90-degree approach, signalize the intersection with turn pockets, bus-stops, and pedestrian crosswalks and trails.	The Annenberg Project at Lower Point Vicente & City of Rancho Palos Verdes
4	Hawthorne/Via Rivera	Install new traffic signal	The Annenberg Project at Lower Point Vicente mitigation measure
5	PVDS/Forrestal Dr. - Ocean Trails Dr.	Install new traffic signal	The Annenberg Project at Lower Point Vicente mitigation measure
6	Crenshaw Blvd./Crest Dr.	Operational improvement such as traffic signal, roundabout or channelization.	City of Rancho Palos Verdes
7	10 locations, including Hawthorne/Via Rivera, PVDS/PVDE, Miraleste/1st St. and PVDE/Forrestal	Upgrade traffic signals, including replacement of the existing pedestrian heads with pedestrian count-down heads.	City of Rancho Palos Verdes

TABLE 1 (Cont)

PLANNED INTERSECTION AND ROADWAY IMPROVEMENTS

IMPROVE-MENT NO.	IMPROVEMENT LOCATION	IMPROVEMENT DESCRIPTION	RESPONSIBLE ENTITY
8	PVDW & PVDS from the North City Limit to the East City Limit	Class II Bikeway	City of Rancho Palos Verdes
9	PVDW from Oceanfront Estates to PVIC Entrance, PVDW from Coast Guard lighthouse entrance to Fishing Access, PVDS form Seahill Dr to Abalone Cove Park entrance, PVDW from PVE border to Hawthorne Blvd., PVDS from Crestmont Ln to Seahill Dr.	Sidewalk improvements	City of Rancho Palos Verdes
10	PVDE @ Bronco Drive	Improve portions of PVDE to provide wider travel lanes in each direction and improve pedestrian/equestrian path by trimming shrubbery and thinning over-grown brush and installing high-visibility crossing.	City of Rancho Palos Verdes
11	PVDE from Ganado Dr. to Marymount College	Reduce travel lanes from 2 lanes in each direction to 1 lane in each direction	City of Rancho Palos Verdes
12	PVDE from Miraleste Dr. to Miraleste Library	Improve sidewalks for pedestrian safety and circulation improvements. Add high visibility crossings at Miraleste Intermediate School and Via Canada	City of Rancho Palos Verdes
13	PVDE @ Switchbacks	Re-stripe and/or widen to provide maximum shoulder area for cycling safety and narrower roadway lanes for traffic calming; provide Type II bikeway	City of Rancho Palos Verdes

One intersection, at Western Avenue and Toscanini, is included in the County of Los Angeles' Congestion Management Program. Since the intersection is projected to operate at acceptable levels of service in 2035, no further analysis is needed.

II. EXISTING CONDITIONS

Existing General Plan Transportation Systems

The current General Plan for the City of Rancho Palos Verdes notes that there are three major elements of the transportation infrastructure, as follows:

- Vehicular Networks
- Public Transportation
- Path and Trail Networks

Vehicular Network

The vehicular network is currently divided into four basic classifications: freeways, arterials, collectors and locals.

Freeway There are no freeways on the Palos Verdes Peninsula, however the Peninsula and City of Rancho Palos Verdes are served by several freeways in the area including the Harbor Freeway (I-110), the San Diego Freeway (I-405), and the Terminal Island Freeway (SR-103).

Arterial An arterial street is the primary street on the Peninsula and provides connections with other arterials and may link up with major highways. Arterial streets typically range from major 4- or 6-lane divided roadways to secondary/minor 2-lane undivided roadways, each one serving a particular function. Arterial streets usually have limited access to adjacent properties, and their major intersections frequently require signalization. The roadways identified in the current General Plan as arterial streets include Crenshaw Boulevard (north of Crest Road), Crest Road (Hawthorne Boulevard to Crenshaw Boulevard), Hawthorne Boulevard (north of Palos Verdes Drive West), Highridge Road (Hawthorne Boulevard to Crest Road), Miraleste Drive/9th Street, Palos Verdes Drive East, Palos Verdes Drive South, Palos Verdes Drive West, Silver Spur (Hawthorne to Crenshaw).

Collector Collector streets serve to connect local streets to arterial streets, and are typically two-lane undivided roadways. There may be direct access to adjacent properties and on-street parking is usually allowed. The current General Plan identifies the following streets as Collectors: Crest Road from Crenshaw to Palos Verdes Drive East (not including the

privately owned segment within the City of Rolling Hills), Ridgegate Drive/Granvia Altamira, Indian Peak Road, Monternalaga Drive, Silver Spur Road.

Local Although not specifically identified in the current General Plan, the local streets are the remaining streets not noted in the other categories. Local streets are typically narrower 2-lane undivided roadways that provide direct access to adjacent properties and usually have on-street parking.

Existing Roadway Conditions

The City of Rancho Palos Verdes is served by the major street system described in the following paragraphs:

Crenshaw Boulevard is an Arterial traversing the City in a north-south direction from Crest Road to the North City Limit. This roadway provides two lanes of travel in each direction, with opposing lanes of traffic separated by a raised median. Crenshaw Boulevard has a posted speed limit of 45 mph.

Crest Road is an east-west Arterial from Hawthorne Boulevard to Crenshaw Boulevard with two lanes of traffic in each direction. The opposing lanes of traffic are separated by a raised median. Crest Road is a two-lane undivided Collector from Crenshaw Boulevard to Palos Verdes Drive East. The posted speed limit is 40 mph on the Arterial section. The prima facie speed limit on the Collector section is 25 mph.

Crestridge Road is an east-west Local from Highridge Road to east of Crenshaw Boulevard, with one lane of traffic in each direction. The opposing lanes of traffic are separated by a raised median. The posted speed limit is 40 mph.

Hawthorne Boulevard is an Arterial traversing the entire City in a north-south direction. This roadway provides two lanes of traffic in each direction separated by a raised center median. The posted speed limit on Hawthorne Boulevard is 45 mph.

Highridge Road is a north-south Arterial from Crest Road to Hawthorne Boulevard, with one lane of traffic in each direction. The opposing lanes of traffic are separated by a raised median. The posted speed limit is 35 mph.

Indian Peak Road is a north-south Collector from Crenshaw Boulevard to Hawthorne Boulevard, with one lane of traffic in each direction. The opposing lanes of traffic are separated by a raised median. The posted speed limit is 35 mph.

Miraleste Drive is a north-south Arterial from Palos Verdes Drive East to Western Avenue, with one lane of traffic in each direction. The opposing lanes of traffic are separated by a wide landscaped median from Palos Verdes Drive East to just north of Via Colinita and a two-way left turn lane south of Via Colinita. The posted speed limit on Miraleste Drive is 35 mph.

Palos Verdes Drive East (PVDE) is currently identified as an Arterial. This north-south roadway provides one lane of traffic in each direction, except for the section from Calle Aventura to Ganado Drive, which is four lanes of traffic. Opposing lanes of traffic are generally separated by a double yellow centerline, except on either side of Crest Road, where it is separated by a raised median. The posted speed limit is 40 mph on Palos Verdes Drive East, except in the vicinity of Ganado Dr where it is 35 mph.

Palos Verdes Drive South (PVDS) is an Arterial street within the City. This east-west roadway traverses the entire City. The roadway provides two lanes of traffic in each direction, separated by a raised center median. East of Palos Verdes Drive East, Palos Verdes Drive South generally provides one lane of traffic in each direction with opposing lanes of traffic separated by a double-yellow line. The posted speed limit on Palos Verdes Drive South is 45 mph.

Palos Verdes Drive West (PVDW) is identified as an Arterial. This north-south roadway provides two lanes of traffic in each direction. Opposing lanes of traffic are separated by a raised median. The posted speed limit is 45 mph on Palos Verdes Drive West.

Silver Spur Road is a north-south Collector north of Hawthorne Boulevard, with one lane of traffic in each direction generally separated by a raised median. The posted speed limit is 35 or 45 mph, depending on the section of Silver Spur Road.

Western Avenue is a major north-south arterial street. Western Avenue provides two lanes of traffic in each direction. Opposing lanes of traffic are separated by a raised center median. The posted speed limit on Western Avenue is 35 mph.
Since intersection operations typically define roadway conditions, operating conditions at the 22 study area intersections (listed previously in Section 1) were analyzed during the AM and PM peak hours.

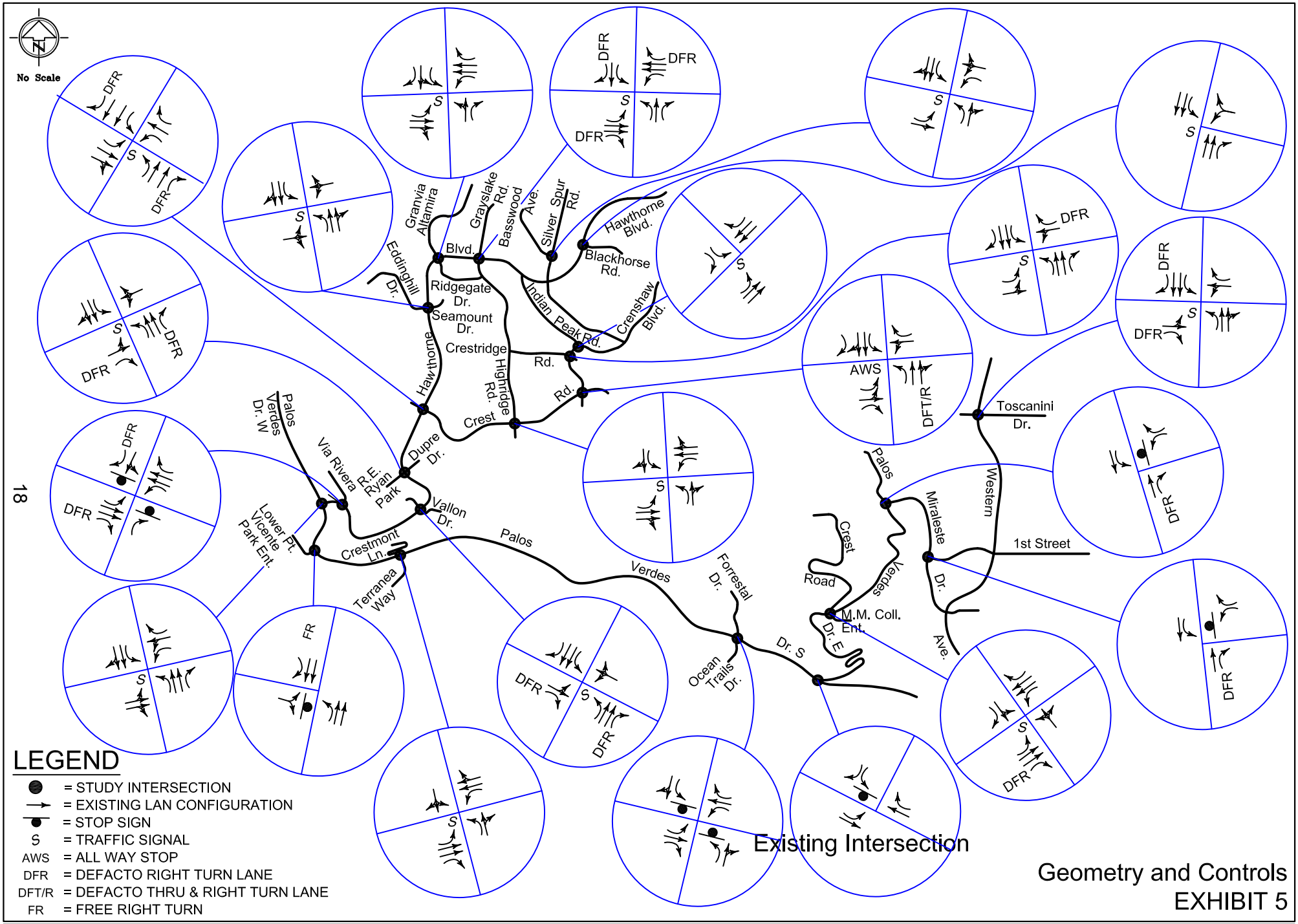
In order to evaluate current operations in the study area, a field review of the study area intersections was performed and traffic counts were collected. ***Exhibit 5*** presents the existing roadway configurations, intersection geometrics, and intersection controls in the project study area, which were observed in the field review.

Existing Traffic Volumes

AM and PM peak period traffic counts were collected from various sources (see **Table D1** in **Appendix D**) and balanced between intersections to provide flow conservation (see **Exhibit D-1** in **Appendix D**). The most recent counts were conducted in 2009. Since traffic at the intersections were balanced, 2009 was assumed to be the base traffic count year. To simulate 2010 existing conditions, a growth rate of 0.646 percent was applied. The growth rate is the same rate used to represent ambient growth and is discussed in more detail in Section III.

The Existing AM and PM peak hour traffic volumes are illustrated on ***Exhibit 6***. The AM and PM peak hour count data is included in ***Appendix D***.

Existing daily traffic volumes on the study area roadways were also collected from various available sources, all counted in 2008. Where the counts were not available, the existing daily traffic volumes were estimated by applying a Daily–to–PM peak hour ratio of 13:1 to the existing PM peak hour traffic volumes. The ratio was derived from the existing traffic counts. To represent 2010 conditions, a growth rate of 0.646 percent per year was applied



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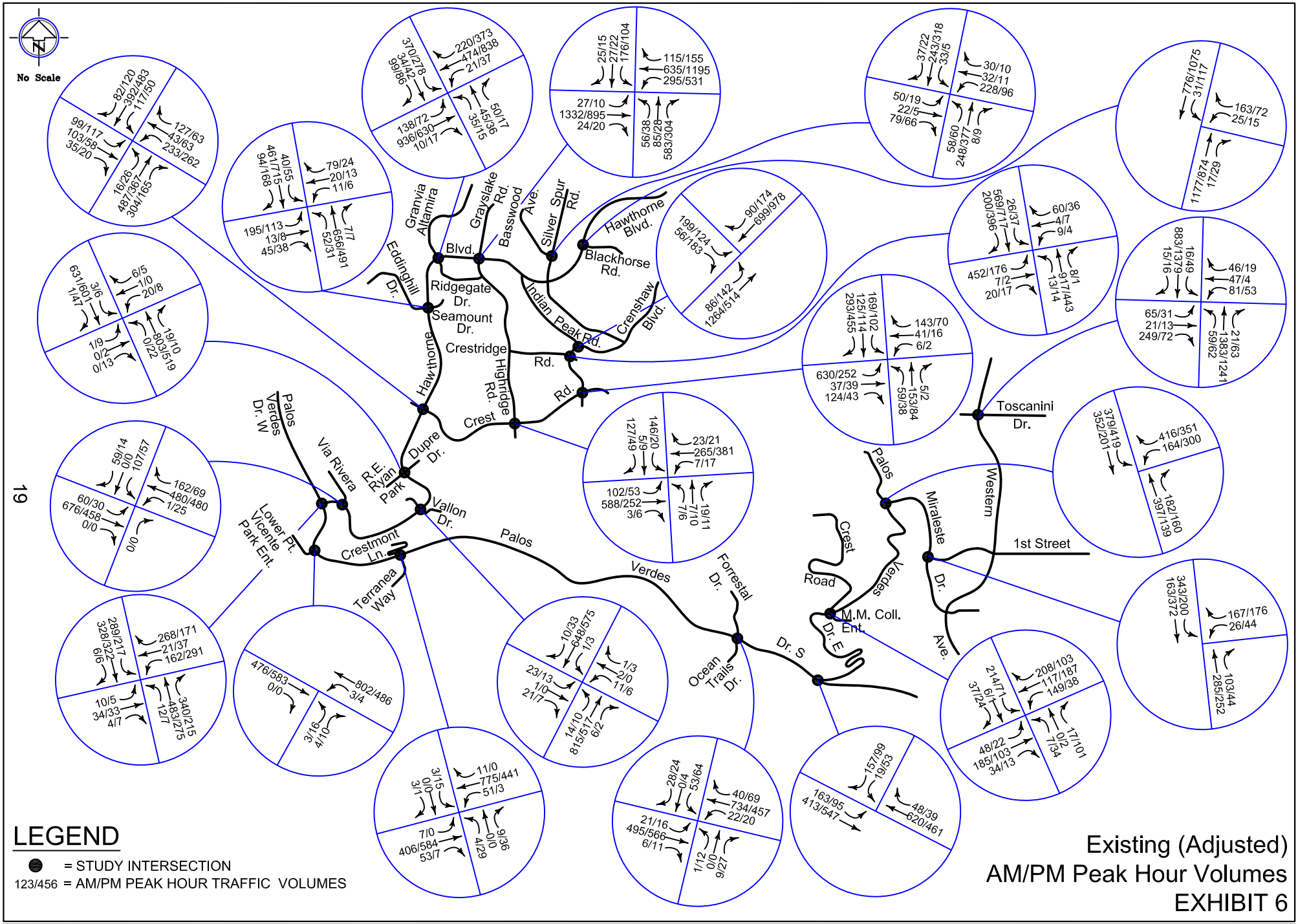
General Plan Circulation Element Update
Traffic Impact Analysis (#100114)
City of Rancho Palos Verdes



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to the existing traffic volumes. Two years of growth were applied to the traffic count volumes and one-year of growth was applied to the estimated traffic volumes. The resulting Existing daily traffic volumes are shown on ***Table 2.***

Existing Conditions Intersection Analysis

The operating conditions at the study intersections were evaluated utilizing the Intersection Capacity Utilization (ICU) and 2000 Highway Capacity Manual (HCM) methodologies described in Section I. ***Table 3*** summarizes the results of the intersection analysis for Existing conditions.

The following four study intersections are currently operating at unacceptable levels of service during the AM peak hour and/or the PM peak hour:

10. Grayslake Road-Highridge Road/Hawthorne Boulevard
17. Forrestal Drive – Ocean Trails Drive/Palos Verdes Drive South
18. Palos Verdes Drive East/Miraleste Drive
20. Palos Verdes Drive East/Palos Verdes Drive South

The supporting ICU and HCM intersection analyses worksheets can be referenced in ***Appendix E***.

Existing Conditions Roadway Segment Analysis

Daily traffic volumes are not typically used to determine roadway capacity for existing or near-term conditions since intersection capacity/operations more realistically represent roadway operating conditions. For this study, they have been provided for comparison to the General Plan Buildout (2035) conditions.

The Orange County Transportation Authority's (OCTA) Roadway Design Standards Road Capacity Values were used to determine the roadway segment levels of service for existing conditions based on the existing daily traffic volumes for the roadway segments. The results of the analysis are shown in ***Table 4***. ***Table 4*** indicates that 20 of the 28 roadway

TABLE 2

INTERSECTION LEVEL OF SERVICE SUMMARY - EXISTING CONDITIONS

	INTERSECTION	AM PEAK HOUR		PM PEAK HOUR	
		ICU or Delay (sec)	LOS	ICU or Delay (sec)	LOS
1	Palos Verdes Dr. W/Hawthorne Bl.	0.698	B	0.559	A
2	Palos Verdes Dr. W/Lower Pt. Vicente Park Ent.	14.9	B	17.9	C
3	Via Rivera/Hawthorne Bl.	24.0	C	25.1	D
4	Hawthorne Bl./Eddinghill Dr. - Seamount Dr.	0.605	B	0.507	A
5	Hawthorne Bl./Crest Rd.	0.623	B	0.563	A
6	Hawthorne Bl./Dupre Dr. - R. E. Ryan Park Dwy.	0.401	A	0.407	A
7	Hawthorne Bl./Vallon Dr.	0.410	A	0.368	A
8	Crestmont Ln. - Terranea Wy./Palos Verdes Dr. S	0.387	A	0.380	A
9	Gravania Altamira - Ridgegate Dr./Hawthorne Bl.	0.631	B	0.584	A
10	Grayslake Rd. - Highridge Rd./Hawthorne Bl.	1.176	F	0.948	E
11	Highridge Rd./Crest Rd.	0.355	A	0.367	A
12	Silver Spur Rd./Hawthorne Bl.	0.466	A	0.456	A
13	Hawthorne Bl./Blackhorse Rd.	0.552	A	0.438	A
14	Crenshaw Bl./Indian Peak Rd.	0.693	B	0.657	B
15	Crenshaw Bl./Crestridge Rd.	0.637	B	0.519	A
16	Crenshaw Bl./Crest Rd.	31.4	D	13.8	B
17	Forrestal Dr. - Ocean Trails Dr./Palos Verdes Dr. S	79.3	F	62.2	F
18	Palos Verdes Dr. E/Miraleste Dr.	967.8	F	913.6	F
19	Palos Verdes Dr. E/Crest Rd. - Marymount Col. Dwy.	0.442	A	0.328	A
20	Palos Verdes Dr. E/Palos Verdes Dr. S	43.6	E	44.9	E
21	Miraleste Dr./1st St.	17.4	C	17.2	C
22	Western Ave./Toscanini Dr.	0.668	B	0.620	B

ICU = Intersection Capacity Utilization; LOS = Level of Service

TABLE 3

ROADWAY SEGMENT DAILY TRAFFIC VOLUMES

STREET	SEGMENT	DAILY TRAFFIC VOLUMES				
		EXISTING[1] (2010)	AMBIENT GROWTH[3]	RELATED PROJECTS	VACANT PARCELS	GEN PLAN BUILDOUT TOTAL
Crenshaw Blvd.	North City Limit - Indian Peak Rd.	23,413	3,781	3,248	782	31,224
	Indian Peak Rd. - Crest Rd.[2]	15,304	2,663	4,550	800	23,317
Crest Rd.	Hawthorne Blvd - Crenshaw Blvd.	11,178	1,945	3,267	756	17,146
	Palos Verdes Dr. E - Ganado Dr.	2,917	471	96	0	3,484
Crestridge Rd.	Highridge Rd. - Crenshaw Blvd.	8,083	1,305	1,131	16	10,535
Hawthorne Blvd.	North City Limit - Blackhorse Rd.	27,965	4,516	3,992	424	36,897
	Blackhorse Rd. - Indian Peak Rd.	26,068	4,210	4,016	418	34,712
	Indian Peak Rd. - Grayslake Rd./Highridge Rd.	41,160	6,647	4,369	572	52,748
	Grayslake Rd./Highridge Rd. - Granvia Altamira/Ridgegate Dr.	28,436	4,592	3,747	520	37,295
	Granvia Altamira/Ridgegate Dr. - Eddinghill Dr./Seamount Dr.	21,701	3,505	3,340	518	29,064
	Eddinghill Dr./Seamount Dr. - Crest Rd.	16,884	2,727	2,922	518	23,051
	Crest Rd. - Vallon Dr.	17,437	2,816	5,780	1,234	27,267
	Vallon Dr. - Palos Verdes Dr. W	14,769	2,385	5,796	1,214	24,164
Highridge Rd.	Hawthorne Blvd. - City Limit with Rolling Hills Estates[2]	8,634	1,502	262	50	10,448
Indian Peak Rd.	Crenshaw Blvd. - City Limit with Rolling Hills Estates[2]	8,931	1,554	1,994	18	12,497
Miraleste Dr.	Palos Verdes Dr. E - 1st St.	16,088	2,598	194	170	19,050
	1st St. - East City Limit at 9th St.	6,069	980	194	166	7,409
Palos Verdes Dr. E	North City Limit - Miraleste Dr.	14,519	2,345	1,682	494	19,040
	Miraleste Dr. - North of Crest Dr.	10,464	1,690	1,876	448	14,478
	North of Crest Dr. - Ganado Dr.	7,887	1,274	1,874	318	11,353
	Ganado Dr. - Palos Verdes Dr. S	5,010	809	966	318	7,103
Palos Verdes Dr. S	Palos Verdes Dr. W and Crestmont Ln./Terranea Wy.[2]	13,082	2,276	5,330	1,804	22,492
	Crestmont Ln./Terranea Wy. - Forrestal Dr./Ocean Trails Dr.[2]	12,950	2,253	4,494	1,804	21,501
	Forrestal Dr./Ocean Trails Dr. - Palos Verdes Dr. E	15,783	2,549	4,396	1,370	24,098
	Palos Verdes Dr. E - East City Limit	14,440	2,332	4,202	1,258	22,232
Palos Verdes Dr. W	North City Limit - Hawthorne Blvd.	13,096	2,279	1,886	589	17,850
	Hawthorne Blvd. - Palos Verdes Dr. S	14,703	2,558	5,390	1,804	24,455
Silver Spur Rd.	North City Limit - North of Hawthorne Blvd.[2]	9,079	1,525	370	18	10,992
Western Ave.	North City Limit - South City Limit	21,844	3,670	3,786	1,196	30,496

[1] Existing traffic volumes were calculated from 2009 PM peak hour turning movement counts using a daily-to-peak ratio of 13. Volumes include one year of growth at 0.646%/year.

[2] Existing traffic volume derived from traffic count data collected in 2008 for the initial *Traffic Impact Analysis of the City of Rancho Palos Verdes General Plan Update* , prepared by LSA Associates, Inc. in October 2009. Volume reflects 0.646% growth for two years (1.292%) to represent 2010 conditions.

[3] The ambient growth for 25 years at 0.646%/year is 16.15%.

TABLE 4

ROADWAY SEGMENTS LEVEL OF SERVICE SUMMARY - EXISTING CONDITIONS

STREET	SEGMENT	EXISTING LANE CONFIG	EXISTING DAILY VOLS (2010)	LEVEL OF SERVICE (LOS)[1]
Crenshaw Blvd.	North City Limit - Indian Peak Rd.	4D	23,413	B
	Indian Peak Rd. - Crest Rd.	4D	15,502	A
Crest Rd.	Hawthorne Blvd - Crenshaw Blvd.	4D	13,167	A
	Palos Verdes Dr. E - Ganado Dr.	2U	2,917	A
Crestridge Rd.	Highridge Rd. - Crenshaw Blvd.	2D	9,104	A
Hawthorne Blvd.	North City Limit - Blackhorse Rd.	4D	27,965	C
	Blackhorse Rd. - Indian Peak Rd.	4D	26,068	B
	Indian Peak Rd. - Grayslake Rd./Highridge Rd.	4D	41,330	F
	Grayslake Rd./Highridge Rd. - Granvia Altamira/Ridgegate Dr.	4D	28,606	C
	Granvia Altamira/Ridgegate Dr. - Eddinghill Dr./Seamount Dr.	4D	21,884	A
	Eddinghill Dr./Seamount Dr. - Crest Rd.	4D	17,368	A
	Crest Rd. - Vallon Dr.	4D	19,164	A
	Vallon Dr. - Palos Verdes Dr. W	4D	16,849	A
Highridge Rd.	Hawthorne Blvd. - City Limit with Rolling Hills Estates	2D	8,746	A
Indian Peak Rd.	Crenshaw Blvd. - City Limit with Rolling Hills Estates	2D	9,046	A
Miraleste Dr.	Palos Verdes Dr. E - 1st St.	2D	16,088	D
	1st St. - East City Limit at 9th St.	2U	6,069	A
Palos Verdes Dr. E	North City Limit - Miraleste Dr.	2U	14,519	F
	Miraleste Dr. - North of Crest Dr.	2U	10,464	D
	North of Crest Dr. - Ganado Dr.	4U	7,887	A
	Ganado Dr. - Palos Verdes Dr. S	2U	5,010	A
Palos Verdes Dr. S	Palos Verdes Dr. W and Crestmont Ln./Terranea Wy.	4D	13,251	A
	Crestmont Ln./Terranea Wy. - Forrestal Dr./Ocean Trails Dr.	4D	13,117	A
	Forrestal Dr./Ocean Trails Dr. - Palos Verdes Dr. E	4D	16,581	A
	Palos Verdes Dr. E - East City Limit	2U	15,120	F
Palos Verdes Dr. W	North City Limit - Hawthorne Blvd.	4D	13,986	A
	Hawthorne Blvd. - Palos Verdes Dr. S	4D	15,920	A
Silver Spur Rd.	North City Limit - North of Hawthorne Blvd.	2D	9,196	A
Western Ave.	North City Limit - South City Limit	4D	21,844	A

[1] Level of Service based on the Road Capacity Values listed below, from the Orange County Transportation Authority, except for 2 Lanes Divided, which was not included in the table. Values for 2 Lanes Divided were calculated as one-half of the values for 4 Lanes Divided, based on the relationship of the values of 2 Lanes Undivided to 4 Lanes Undivided.

	LEVEL OF SERVICE					
TYPE OF ARTERIAL	A	B	C	D	E	F
8 Lanes Divided (8D)	45000	52500	60000	67500	75000	--
6 Lanes Divided (6D)	33900	39400	45000	50600	56300	--
4 Lanes Divided (4D)	22500	26300	30000	33800	37500	--
4 Lanes Undivided (UD)	15000	17500	20000	22500	25000	--
2 Lanes Divided (2D)	11300	13200	15000	16900	18800	--
2 Lanes Undivided (2U)	7500	8800	10000	11300	12500	--

Note: The Road Capacity Values are the maximum Average Daily Traffic for the given Level of Service.

segments are currently operating at level of service (LOS) A, two are operating at LOS B, one is operating at LOS C and two are operating at LOS D. The remaining three roadway segments, listed below, are currently operating at an unacceptable level of service, LOS F.

- Hawthorne Boulevard – Indian Peak Road to Grayslake Road/Highridge Road
- Palos Verdes Drive East – North City Limit to Miraleste Drive
- Palos Verdes Drive West – Palos Verdes Drive East to East City Limit

Existing Conditions Traffic Signal Warrant Analysis

A traffic signal warrant analysis was performed to determine if any of the seven unsignalized study intersections currently meet warrants for a traffic signal. The *California Manual of Uniform Traffic Control Devices* (CA MUTCD*)* Warrant 3, Peak Hour, was used for existing conditions. The analysis showed that the following two intersections currently meet both Part A and Part B for Warrant 3:

- Crenshaw Boulevard (NS) and Crest Road (EW)
- Palos Verdes Drive East and Miraleste Drive (EW)

The traffic signal warrant worksheets are included in ***Appendix H*** The remaining intersections do not currently meet the minimum traffic signal warrants.

III. FUTURE GROWTH

Regional Growth

Since the Palos Verdes Peninsula is isolated from other areas and mostly built-out, it is expected that there would be little regional or ambient growth. To be conservative, however, an ambient growth factor was applied to the existing traffic volumes. A growth rate of 0.646 percent per year was based on regional growth rates for the South Bay area contained in the 2004 *Los Angeles County Congestion Management Program (CMP)*. When expanded out to the analysis year of 2035, a regional growth factor of 1.17 was applied to the existing 2010 traffic counts.

Related Projects

To ensure that all anticipated development by General Plan Buildout in 2035 was included in the study, a list was obtained of related projects from the City of Rancho Palos Verdes, the City of Rolling Hills Estates and the City of Los Angeles. The list was compiled by Linscott, Law and Greenspan Engineers for the 2010 traffic impact analysis for The Annenberg Project at Lower Point Vicente and was updated by the City of Rancho Palos Verdes Planning Department staff. The list includes projects that are pending or approved and that are expected to be in place by 2035. ***Exhibit 7*** lists the related projects used in the analysis and shows their locations. Related project trip generation and available trip distributions from this source were used in the analysis.

Table 5 includes a description of each related project and the trips anticipated to be generated by each of the related projects. The trip distribution for each related project is illustrated on exhibits in ***Appendix F***. The AM and PM peak hour trips generated by the related projects are illustrated on ***Exhibit G-1 in Appendix G***. The related projects' daily trips are shown in previous ***Table 5***.

Vacant Parcels

Since the build-up methodology was used to estimate 2035 traffic volumes, the trips that

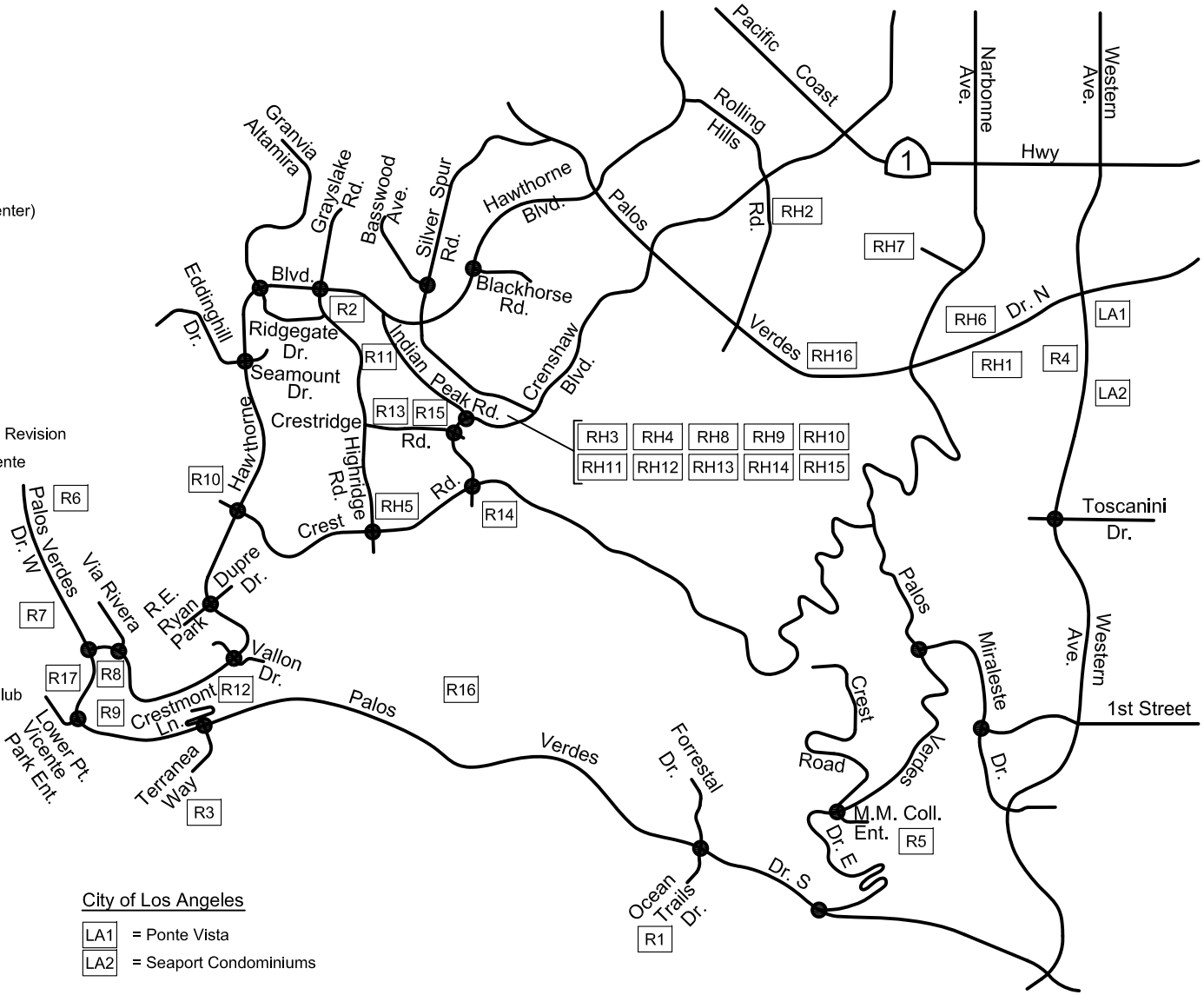
No Scale

City of Rancho Palos Verdes

- R1 = Trump National Golf Club (Ocean Trails)
- R2 = Chevron with Car Wash
- R3 = Terranea Resort and Spa
- R4 = Green Hills Memorial Park
- R5 = Marymount College Facilities Expansion
- R6 = TTM No. 52666
- R7 = Ocean Front Estates
- R8 = Trader Joe's (Golden Cove Shopping Center)
- R9 = Pointe Vicente Animal Hospital
- R10 = Hawthorne/Crest Office Building
- R11 = Highridge Condominiums
- R12 = Salvation Army Crestridge College
- R13 = Crestridge Estate LLC
- R14 = St. John Fisher Church Expansion
- R15 = Mirandella
- R16 = Zone 2 Landslide Moratorium Ordinance Revision
- R17 = The Annenburg Project at Lower Pt. Vicente

City of Rancho Palos Verdes

- RH1 = Rolling Hills Covenant Church
- RH2 = Tanglewood Subdivision
- RH3 = Silver Spur Court
- RH4 = Rolling Hills Villas
- RH5 = Crest Road Building
- RH6 = Butcher Ranch
- RH7 = Chandler Ranch/Rolling Hills Country Club
- RH8 = 627 Deep Valley Drive
- RH9 = Brickwalk LLC Residential
- RH10 = 827 Deep Valley Drive
- RH11 = Mediterranean Village
- RH12 = Silverdes Medical Office
- RH13 = Continental Development
- RH14 = Silver Center
- RH15 = Promenade Peninsula
- RH16 = 2901 Palos Verdes Drive North



City of Los Angeles

- LA1 = Ponte Vista
- LA2 = Seaport Condominiums

LEGEND

- ● = STUDY INTERSECTION
- R1 = RELATED PROJECT LOCATION

Related Projects Location Map
EXHIBIT 7

WILLDAN Engineering

General Plan Circulation Element Update
Traffic Impact Analysis (#100114)
City of Rancho Palos Verdes

TABLE 5

RELATED PROJECTS LIST AND TRIP GENERATION

NO.	DESCRIPTION	STATUS / SIZE	DAILY VOLS	AM PK HR VOLS			PM PK HR VOLS		
				In	Out	Total	In	Out	Total
	City of Rancho Palos Verdes								
R 1	**Trump National Golf Club** (Ocean Trails) Palos Verdes Drive South, west of Shoreline Park	*Partially Built (5 homes built)*	**555**	**11**	**33**	**44**	**38**	**21**	**59**
	- Single Family Detached Housing	59 DU	517	10	31	41	35	20	55
	- Affordable Housing	4 DU	38	1	2	3	3	1	4
R 2	**Chevron with Car Wash** 27774 Hawthorne Boulevard (at Grayslake Road/Highridge Road)	*Proposed*	**917**	**37**	**35**	**72**	**43**	**41**	**84**
	- Gas Station with Convenience Market and Car Wash	6 VFP							
R 3	**Terranea Resort and Spa** 6610 Palos Verdes Drive South	*Built*	**6,263**	**195**	**118**	**313**	**247**	**252**	**499**
	- Resort Hotel	550 Rooms							
	- Condominiums	32 DU							
	- Retail	20,000 GLSF							
	- Restaurant	22,500 GLSF							
	- Fitness Center	22,000 GLSF							
	- Golf Course	9 Holes							
R 4	**Green Hills Memorial Park Master Plan** 27501 S. Western Avenue	*Approved*	**129**	**4**	**1**	**5**	**8**	**15**	**23**
	- Mausoleum (over 50 years)	27.3 Acres (94,525 SF)							
R 5	**Marymount College Facilities Expansion** 30800 Palos Verdes Drive East	*Approved*	**1,931**	**149**	**51**	**200**	**83**	**92**	**175**
	- Junior College Building Expansion	77,504 SF							
	- Demolish Existing Building	-18,022 SF							
	- BA Degree Program (University)	250 STU							
	- Junior College	-250 STU							
	- Jr. College Wkend Enrollment Incr.	67 STU							
R 6	**TTM No. 52666** 3200 Palos Verdes Drive West	*Partially Built (10 homes built)*	**29**	**1**	**1**	**2**	**2**	**1**	**3**
	- Single Family Residential	3 DU							

TABLE 3

(Page 2 of 5)

RELATED PROJECTS LIST AND TRIP GENERATION (Cont)

NO.	DESCRIPTION	STATUS / SIZE	DAILY VOLS	AM PK HR VOLS			PM PK HR VOLS		
				In	Out	Total	In	Out	Total
City of Rancho Palos Verdes (cont)									
R 7	**Ocean Front Estates**								
	Seaward side of Palos Verdes Dr. W.	*Partially Built*							
	at terminus of Hawthorne Boulevard	*(74 homes built)*	**48**	**1**	**3**	**4**	**3**	**2**	**5**
	- Single Family Detached Housing	5 DU							
R 8	**Trader Joe's**								
	Golden Cove Shopping Center	*Built*							
	31176 Hawthorne Boulevard	*(Opened 4/10)*	**1,125**	**24**	**15**	**39**	**59**	**57**	**116**
	- Supermarket	11,000 GLSF							
R 9	**Point Vicente Animal Hospital**								
	31270 Palos Verdes Drive West	*Approved*	**270**	**17**	**6**	**23**	**11**	**16**	**27**
	- Animal Hospital	5,759 GSF							
R 10	**Hawthorne/Crest Office Building**	*Permit Expired*							
	29941 Hawthorne Boulevard	*(10/09)*	**80**	**10**	**1**	**11**	**2**	**9**	**11**
	- Office	7,232 GSF							
R 11	**Highridge Condominiums**								
	28220 Highridge Road	*Approved*	**163**	**2**	**10**	**12**	**10**	**5**	**15**
	- Condominiums	27 DU							
R 12	**Salvation Army Crestridge College**	*Built*							
	30840 Hawthorne Boulevard	*(Opened 4/04)*	**133**	**2**	**8**	**10**	**8**	**4**	**12**
	- Apartment (Campus Housing)	20 DU							
R13	**Crestridge Estate LLC**								
	5601 Crestridge Road	*Proposed*	**542**	**14**	**14**	**28**	**14**	**15**	**29**
	- Senior Condominiums	90 DU	313	4	8	12	8	6	14
	- Senior Center	10,000 GSF	229	10	6	16	6	9	15
R 14	**St. John Fisher Church Expansion**								
	5448 Crest Road	*Approved*	**380**	**24**	**20**	**44**	**22**	**23**	**45**
	- Day Care Center	40 STU	179	17	15	32	16	17	33
	- Proposed new building area	32,426 GSF	295	11	7	18	9	9	18
	- Existing to be demolished	-10,329 GSF	-94	-4	-2	-6	-3	-3	-6
R 15	**Mirandella**								
	Northwest corner of								
	Crenshaw Blvd./Crestridge Rd.	*Under Construction*	**272**	**2**	**16**	**18**	**16**	**9**	**25**
	- Senior Apartments	34 DU							

TABLE 3

(Page 3 of 5)

RELATED PROJECTS LIST AND TRIP GENERATION (Cont)

NO.	DESCRIPTION	STATUS / SIZE	DAILY VOLS	AM PK HR VOLS			PM PK HR VOLS		
				In	Out	Total	In	Out	Total
City of Rancho Palos Verdes (cont)									
R 16	**Zone 2 Landslide Moratorium Ordinance Revision** North of Palos Verdes Drive South btwn Narcissa Dr. and Peppertree Dr.	*Approved*	**450**	**9**	**20**	**29**	**30**	**17**	**47**
	- Single-Family Detached Housing	47 DU							
R 17	**The Annenberg Project at Lower Point Vicente** 31501 Palos Verdes Drive West	*Proposed*	**596**	**81**	**30**	**111**	**51**	**59**	**110**
	- Educational Interpretive Center	35,200 GSF							
City of Rolling Hills Estates									
RH-1	**Rolling Hills Covenant Church** 2221-2222 Palos Verdes Drive North	*Proposed*	**1,000**	**68**	**28**	**96**	**41**	**59**	**100**
	- Church	1,650 Seats							
RH-2	**Tanglewood Subdivision** Rolling Hills Rd. & Tanglewood Ln.	*Proposed*	**29**	**1**	**1**	**2**	**2**	**1**	**3**
	- Single Family Detached Housing	3 DU							
RH-3	**Silver Spur Court** 981 Silver Spur Rd.	*Built/Partially Occupied*	**105**	**1**	**7**	**8**	**6**	**3**	**9**
	- Condominiums	18 DU							
RH-4	**Rolling Hills Villas** 901 Deep Valley Drive	*Built/Partially Occupied*	**209**	**3**	**4**	**7**	**7**	**6**	**13**
	- Senior Housing - Detached	41 DU	*143*	*2*	*3*	*5*	*4*	*3*	*7*
	- Retail	1.215 GLSF	*66*	*1*	*1*	*2*	*3*	*3*	*6*
RH-5	**Crest Road Building** 5883 Crest Road	*Approved*	**102**	**7**	**1**	**8**	**3**	**9**	**12**
	- Office	4,545 GSF	50	6	1	7	1	6	7
	- Retail	1,215 GLSF	52	1	0	1	2	3	5
RH-6	**Butcher Ranch** Palos Verdes Dr. N & Montecillo Dr.	*Proposed*	**105**	**2**	**6**	**8**	**7**	**4**	**11**
	- Single Family Detached Housing	11 DU							

TABLE 3

(Page 4 of 5)

RELATED PROJECTS LIST AND TRIP GENERATION (Cont)

NO.	DESCRIPTION	STATUS / SIZE	DAILY VOLS	AM PK HR VOLS			PM PK HR VOLS		
				In	Out	Total	In	Out	Total
	City of Rolling Hills Estates (cont)								
RH 7	**Chandler Ranch/Rolling Hills Country Club**								
	26311 & 27000 Palos Verdes Dr. E.	*Proposed*	**1,486**	**24**	**42**	**66**	**152**	**70**	**222**
	- Single Family Detached Housing	114 DU							
	- Quality Restaurant	338 Seats							
	- Health/Fitness Club	7,150 GSF							
	- Tennis Courts	5 Courts							
	- New Social Club Members	100 Members							
	- (Existing Quarry Removed)								
RH 8	**627 Deep Valley Drive**	*Approved*	**636**	**-2**	**15**	**13**	**30**	**21**	**51**
	- Condominiums	58 DU							
	- Retail	5.810 GLSF							
	- 10% Pass-By								
	- 10% Internal Capture								
RH 9	**Brickwalk LLC Residential**								
	655-693 Deep Valley Drive & 924-950 Indian Peak Road	*Proposed*	**1,470**	**20**	**59**	**79**	**78**	**52**	**130**
	- Condominiums	148 DU	860	11	54	65	52	25	77
	- Retail	14,200 GLSF	610	9	5	14	26	27	53
RH 10	**827 Deep Valley Drive**	*Approved*	**93**	**1**	**6**	**7**	**5**	**3**	**8**
	- Senior Condominiums	16 DU							
RH 11	**Mediteranean Village**								
	927 Deep Valley Drive	*Approved*	**522**	**7**	**28**	**35**	**29**	**17**	**46**
	- Condominiums	75 DU	436	6	27	33	26	13	39
	- Retail	2,000 GLSF	86	1	1	2	3	4	7
RH 12	**Silverdes Medical Office**								
	828 Silver Spur Road	*Approved*	**942**	**55**	**14**	**69**	**26**	**73**	**99**
	- Medical Office	24,518 GSF	886	48	13	61	25	66	91
	- General Office	5,124 GSF	56	7	1	8	1	7	8
RH 13	**Continental Development**								
	627 Silver Spur Road	*Proposed*	**737**	**46**	**32**	**78**	**32**	**49**	**81**
	- Condominiums	70 DU	407	5	26	31	24	12	36
	- Commercial	30,000 GLSF	330	41	6	47	8	37	45

TABLE 3

(Page 5 of 5)

RELATED PROJECTS LIST AND TRIP GENERATION (Cont)

NO.	DESCRIPTION	STATUS / SIZE	DAILY VOLS	AM PK HR VOLS			PM PK HR VOLS		
				In	Out	Total	In	Out	Total
City of Rolling Hills Estates (cont)									
RH 14	**Silver Center**								
	449 Silver Spur Road	*Approved*	**204**	**3**	**2**	**5**	**9**	**9**	**18**
	- Commercial	4,745 GLSF							
RH 15	**Promenade Peninsula**								
	550 Deep Valley Drive	*Proposed*	**1,097**	**15**	**31**	**46**	**53**	**43**	**96**
	- Condominiums	66 DU	383	5	24	29	23	11	34
	- Retail	16,620 GLSF	714	10	7	17	30	32	62
RH 16	**2901 Palos Verdes Drive North**	*Proposed*	**29**	**1**	**1**	**2**	**2**	**1**	**3**
	- Single Family Detached Housing	3 DU							
City of Los Angeles									
LA 1	**Ponte Vista**								
	26900 S. Western Avenue	*Proposed*	**7,270**	**90**	**386**	**476**	**380**	**190**	**570**
	- Multi-Family	385 DU	2,256	29	140	169	134	66	200
	- Condominiums	630 DU	3,692	47	230	277	220	108	328
	- Senior Housing	300 DU	1,322	14	16	30	26	16	42
LA 2	**Seaport Condominiums**								
	Western Avenue at Avenida Aprenda	*Built/Partially Occupied*	**813**	**11**	**51**	**62**	**49**	**24**	**73**
	- Condominiums	230 DU							

DU = Dwelling Units, VFP = Vehicle Fueling Positions, SF = Square Feet, GSF = Gross Square Feet, GLSF = Gross Leasable Square Feet, STU = Students

Source: City of Rancho Palos Verdes and the *Revised Draft Traffic Impact Study, The Annenberg Project at Lower Point Vicente* , prepared by Linscott, Law & Greenspan, Engineers, May 4, 2010

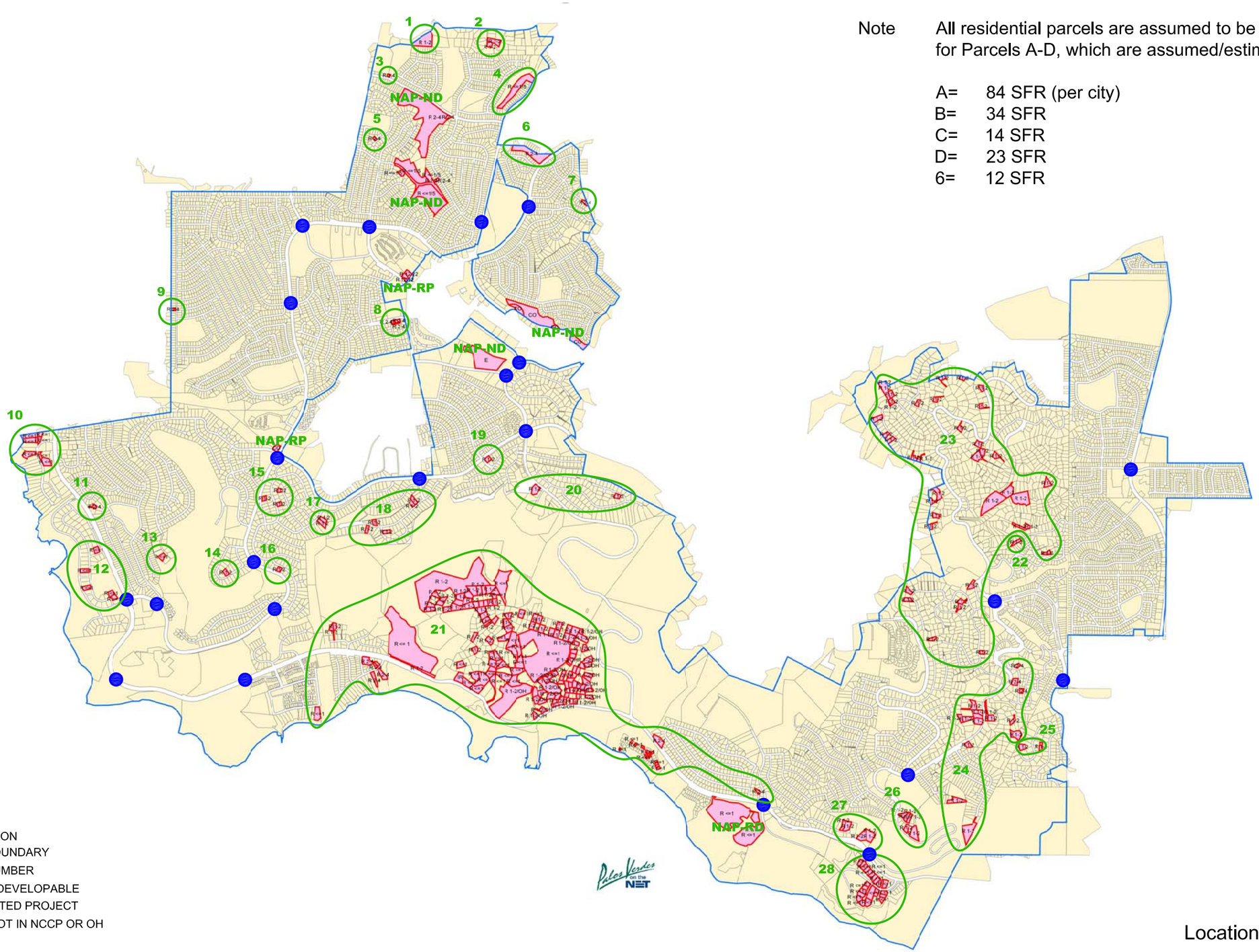
could be generated by the vacant parcels were also included in the analysis. Using the City's GIS system to identify the vacant parcels, City Planning staff developed a map of the vacant parcels with their land uses, and noted any parcels that are undevelopable due to the severe terrain or that are already included on the related projects list (see ***Exhibit 8***). Most parcels would be developed as individual single family residences. For the larger parcels, estimates were made of the number of homes that could reasonably be developed given the terrain and permitted housing density. The parcels were grouped into analysis zones and summarized in ***Table 6***. Over half of the parcels are in the Portuguese Bend area, which is currently of steep terrain and subject to landslides. Although these parcels cannot currently be developed, they were included in the analysis with the assumption that by 2035 a way of stabilizing the slopes to allow development would be discovered.

The trip generation rates for the vacant parcel land uses are from the Institute of Transportation Engineers (ITE) *Trip Generation*, 8th Edition and are listed in ***Table 7***. The trips anticipated to be generated by the vacant parcels are summarized in ***Table 8.*** The exhibits illustrating the trip distribution for each vacant parcel are included in ***Appendix F***. The AM and PM peak hour trips generated by the vacant parcels are illustrated on ***Exhibit G-2 in Appendix G***. The vacant parcels' daily trips are shown in previous ***Table 2.***

No Scale

Note All residential parcels are assumed to be one dwelling unit, except for Parcels A-D, which are assumed/estimated to be as follows:

A= 84 SFR (per city)
B= 34 SFR
C= 14 SFR
D= 23 SFR
6= 12 SFR



LEGEND

- = STUDY INTERSECTION
- = ANALYSIS ZONE BOUNDARY
- 23 = ANALYSIS ZONE NUMBER
- NAP-ND = NOT A PART - NOT DEVELOPABLE
- NAP-RP = NOT A PART - RELATED PROJECT
- = VACANT PARCEL NOT IN NCCP OR OH
- = PARCEL

Vacant Parcels
Location Map and Analysis Zones
EXHIBIT 8

TABLE 6

SUMMARY OF VACANT DEVELOPABLE PARCELS[1]

ANALYSIS ZONE	NUMBER OF VACANT PARCELS, BY LAND USE								TOTAL RESID	TOTAL PARCELS
	R <= 1/5	R <= 1	R 1-2	R 1-2/OH	R 2-4	R 4-6	IE	IR		
1			1						1	1
2			2						2	2
3					1				1	1
4	1								1	1
5					1				1	1
6					12				12	12
7					1				1	1
8					3				3	3
9					1				1	1
10		7							7	7
11					1				1	1
12		5							5	5
13		1							1	1
14			1						1	1
15			3						3	3
16			1						1	1
17			2						2	2
18			5						5	5
19			1						1	1
20			2						2	2
21		127	79	78	7			1	291	292
22			1						1	1
23			38			1			39	39
24			15		3				18	18
25			2						2	2
26			5				2		5	7
27			5						5	5
28		23							23	23
TOTAL	***1***	***163***	***163***	***78***	***30***	***1***	***2***	***1***	***436***	***439***

R <= 1/5 is Residential <= 1 DU/5Acres; R <= 1 is Residential <= 1 DU/Acre; R 1-2 is Residential 1-2 DU/Acre; R 1-2/OH is Residential 1-2/ Open Space; R 2-4 is Residential 2-4 DU/Acre; R 4-6 is Residential 4-6 DU/Acre; IE = Institutional - Educational; IR = Institutional - Religious; DU = Dwelling Unit

[1] Based on information provided by the City of Rancho Palos Verdes.

TABLE 7

VACANT PARCELS TRIP GENERATION RATES[1]

LAND USE	ITE CODE	UNITS[2]	DAILY	AM PEAK HOUR RATES			PM PEAK HOUR RATES		
				In	Out	Total	In	Out	Total
Single Family Residential	210	DU	9.57	0.19	0.56	0.75	0.64	0.37	1.01
Church	560	TSF	9.11	0.35	0.21	0.56	0.26	0.29	0.55
Day Care Center	565	STU	4.48	0.42	0.38	0.80	0.39	0.43	0.82

[1] Source: Institute of Transportation Engineers (ITE) *Trip Generation*, 8th Edition, 2008

[2] DU = Dwelling Unit; TSF = Thousand Square Feet; STU = Student

TABLE 8

VACANT PARCELS TRIP GENERATION[1]

ZONE	LAND USE	QUAN-TITY	UNITS	DAILY VOLS	AM PK HR VOLS			PM PK HR VOLS		
					In	Out	Total	In	Out	Total
1	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
2	Single Family Detached Housing	2	DU	19	0	1	1	1	1	2
3	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
4	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
5	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
6	Single Family Detached Housing	12	DU	115	2	7	9	8	4	12
7	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
8	Single Family Detached Housing	3	DU	29	1	2	3	2	1	3
9	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
10	Single Family Detached Housing	7	DU	67	1	4	5	4	3	7
11	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
12	Single Family Detached Housing	5	DU	48	1	3	4	3	2	5
13	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
14	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
15	Single Family Detached Housing	3	DU	29	1	2	3	2	1	3
16	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
17	Single Family Detached Housing	2	DU	19	0	1	1	1	1	2
18	Single Family Detached Housing	5	DU	48	1	3	4	3	2	5
19	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
20	Single Family Detached Housing	2	DU	19	0	1	1	1	1	2
21	Single Family Detached Housing	291	DU	2,785	55	163	218	186	108	294
	Institutional - Religious	30	TSF	273	11	6	17	8	9	17
	Subtotal			3,058	66	169	235	194	117	311
22	Single Family Detached Housing	1	DU	10	0	1	1	1	0	1
23	Single Family Detached Housing	39	DU	373	7	22	29	25	14	39
24	Single Family Detached Housing	18	DU	172	3	10	13	12	7	19
25	Single Family Detached Housing	2	DU	19	0	1	1	1	1	2
26	Single Family Detached Housing	5	DU	48	1	3	4	3	2	5
	Institutional - Education (2-Day Care)	10	STU	45	4	4	8	4	4	8
	Subtotal			93	5	7	12	7	6	13
27	Single Family Detached Housing	5	DU	48	1	3	4	3	2	5
28	Single Family Detached Housing	23	DU	220	4	13	17	15	9	24
TOTAL				***4,486***	***93***	***260***	***353***	***293***	***172***	***465***

DU = Dwelling Units, TSF = Thousand Square Feet, STU = Student

[1] Based on information regarding vacant developable parcels provided by the City of Rancho Palos Verdes.

IV. GENERAL PLAN BUILDOUT (2035) CONDITIONS

General Plan Buildout (2035) Conditions Intersection Analysis

General Plan Buildout (2035) conditions consist of the sum of the existing traffic volumes plus regional growth plus related project traffic volumes plus vacant parcels traffic volumes. The General Plan Buildout (2035) conditions AM and PM peak hour traffic volumes are shown on ***Exhibit 9***, and were used to estimate the intersection level of service for the study intersections.

It was assumed that planned intersection improvements, along with traffic signals at intersections where existing and projected 2035 warrants were met, would be constructed by 2035. These improvements, listed below and illustrated on ***Exhibit 10***, were included in the analysis.

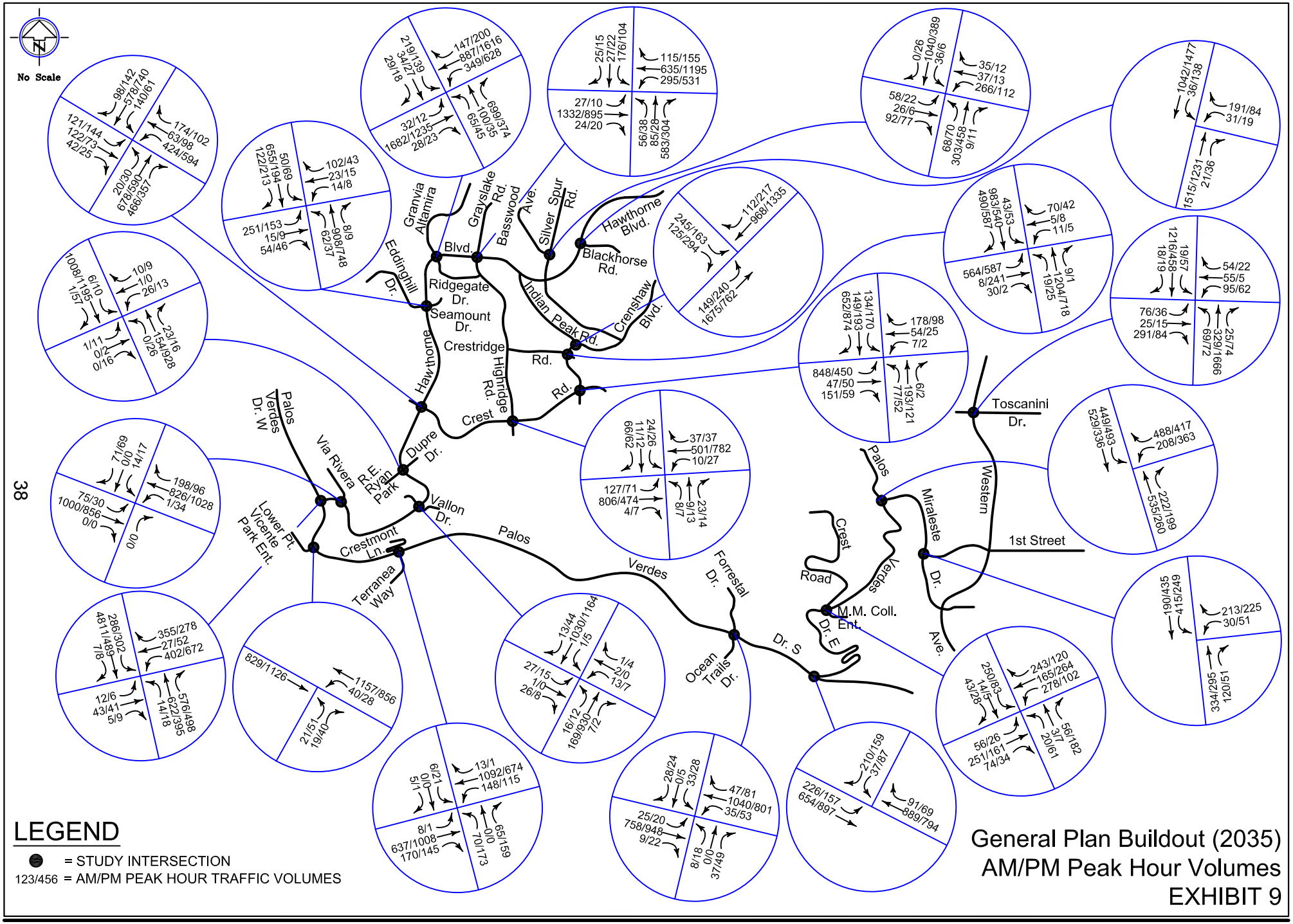
Planned Intersection Improvements (by intersection number)

2. Modifications to the intersection of Palos Verdes Drive West/Lower Point Vicente Park Entrance to realign the driveway to be more perpendicular to Palos Verdes Drive West and a traffic signal, to be funded by the City.

3. A traffic signal at the intersection of Hawthorne Boulevard/Via Rivera, a mitigation measure for The Annenberg Project at Lower Point Vicente. It was assumed that with the traffic signal, full turning movements would be allowed for vehicles exiting the parking lot on the south leg of the intersection.

16. An anticipated traffic signal or equivalent improvment at the intersection of Crenshaw Boulevard/Crest Road as the result of a traffic study of the intersection operations, to be funded by the City.

17. A traffic signal at the intersection of Forrestal Drive-Ocean Trails Drive/Palos Verdes Drive South, a mitigation measure for The Annenberg Project at Lower Point Vicente.

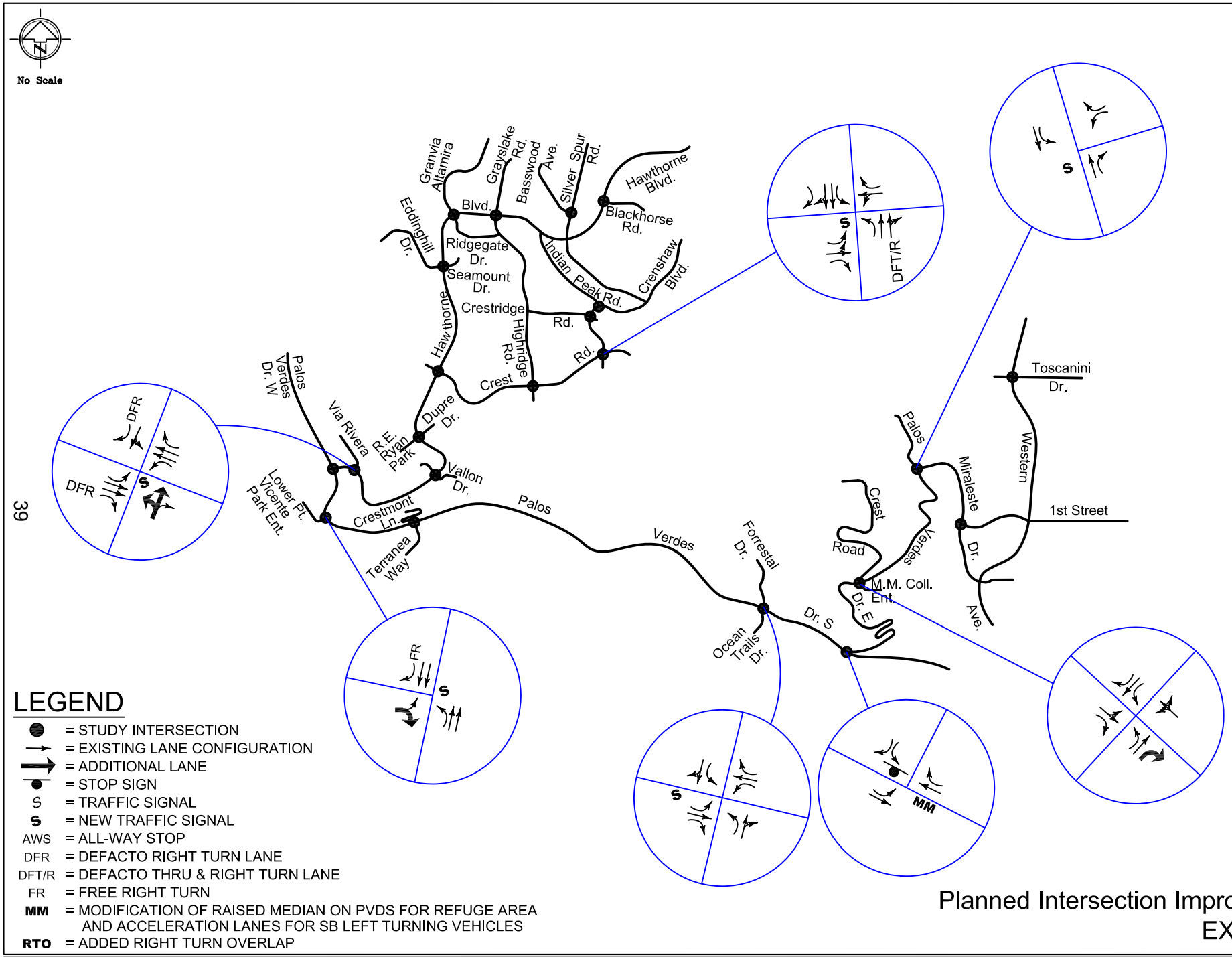


LEGEND

● = STUDY INTERSECTION

123/456 = AM/PM PEAK HOUR TRAFFIC VOLUMES

General Plan Buildout (2035)
AM/PM Peak Hour Volumes
EXHIBIT 9



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LEGEND

- = STUDY INTERSECTION
- = EXISTING LANE CONFIGURATION
- = ADDITIONAL LANE
- = STOP SIGN
- S = TRAFFIC SIGNAL
- **S** = NEW TRAFFIC SIGNAL
- AWS = ALL-WAY STOP
- DFR = DEFACTO RIGHT TURN LANE
- DFT/R = DEFACTO THRU & RIGHT TURN LANE
- FR = FREE RIGHT TURN
- **MM** = MODIFICATION OF RAISED MEDIAN ON PVDS FOR REFUGE AREA AND ACCELERATION LANES FOR SB LEFT TURNING VEHICLES
- **RTO** = ADDED RIGHT TURN OVERLAP

Planned Intersection Improvements
EXHIBIT 10

18 A traffic signal at the intersection of Palos Verdes Drive East/Miraleste Drive, with right turn overlap phasing for westbound, mitigation measures for the Marymount College Expansion project.

20 A modification to the raised median at the intersection of Palos Verdes Drive East/Palos Verdes Drive South to provide a median refuge area for vehicles making left turns onto Palos Verdes Drive South from Palos Verdes Drive East, plus an acceleration lane for the same vehicles to more easily enter eastbound traffic on Palos Verdes Drive East, a mitigation measure for the Marymount College Expansion project.

The results of the intersection analysis are summarized in ***Table 9***. As shown in ***Table 9***, the five intersections listed below would operate at LOS E or F. The CMP intersection would operate at LOS D/C.

1. Palos Verdes Drive West/Hawthorne Boulevard
10. Grayslake Road-Highridge Road/Hawthorne Boulevard
14. Crenshaw Boulevard/Indian Peak Road
18. Palos Verdes Drive East/Miraleste Drive
20. Palos Verdes Drive East/Palos Verdes Drive South

Additional improvements were developed to bring the five intersections to acceptable levels of service, as listed below and shown on ***Exhibit 11***.

1. Add right turn overlap phasing for the northbound right turn at the intersection of Palos Verdes Drive West/Hawthorne Boulevard.

10. Construct a third through lane for eastbound and westbound Hawthorne Boulevard at Grayslake Road-Highridge Road. Also add right turn overlap phasing for the northbound right turn.

TABLE 9

INTERSECTION LEVEL OF SERVICE SUMMARY - GENERAL PLAN BUILDOUT (2035) CONDITIONS

		2035 GP BUILDOUT WITH PLANNED IMPROVEMENTS				2035 GP BUILDOUT WITH PLANNED IMPROVEMENTS			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	INTERSECTION	ICU or Delay (sec)	LOS	ICU or Delay (sec)	LOS	ICU or Delay (sec)	LOS	ICU or Delay (sec)	LOS
1	Palos Verdes Dr. W/Hawthorne Bl.	0.947	**E**	0.909	**E**	0.706	C	0.705	C
2	Palos Verdes Dr. W/Lower Pt. Vicente Park Ent.	0.507	A	0.536	A				
3	Via Rivera/Hawthorne Bl.	0.488	A	0.519	A				
4	Hawthorne Bl./Eddinghill Dr. - Seamount Dr.	0.729	C	0.641	B				
5	Hawthorne Bl./Crest Rd.	0.855	D	0.821	D				
6	Hawthorne Bl./Dupre Dr. - R. E. Ryan Park Dwy.	0.522	A	0.569	A				
7	Hawthorne Bl./Vallon Dr.	0.528	A	0.521	A				
8	Crestmont Ln. - Terranea Wy./Palos Verdes Dr. S	0.535	A	0.652	B				
9	Gravania Altamira - Ridgegate Dr./Hawthorne Bl.	0.760	C	0.731	C				
10	Grayslake Rd. - Highridge Rd./Hawthorne Bl.	1.531	**F**	1.295	**F**	0.867	D	0.711	C
11	Highridge Rd./Crest Rd.	0.439	A	0.482	A				
12	Silver Spur Rd./Hawthorne Bl.	0.533	A	0.525	A				
13	Hawthorne Bl./Blackhorse Rd.	0.790	C	0.681	B				
14	Crenshaw Bl./Indian Peak Rd.	0.836	D	0.916	**E**	0.836	D	0.827	D
15	Crenshaw Bl./Crestridge Rd.	0.780	C	0.927	B				
16	Crenshaw Bl./Crest Rd.	0.680	B	0.578	A				
17	Forrestal Dr. - Ocean Trails Dr./Palos Verdes Dr. S	0.900	D	0.864	D				
18	Palos Verdes Dr. E/Miraleste Dr.	0.909	**E**	0.859	D	0.795	C	0.691	B
19	Palos Verdes Dr. E/Crest Rd. - Marymount Col. Dwy.	0.692	B	0.527	A				
20	Palos Verdes Dr. E/Palos Verdes Dr. E	341.9	**F**	771.6	**F**	0.883	D	0.805	D
21	Miraleste Dr./1st St.	27.1	D	26.0	D				
22	Western Ave./Toscanini Dr.	0.822	D	0.771	C				

ICU = Intersection Capacity Utilization; LOS = Level of Service;

Related Intersection Improvements

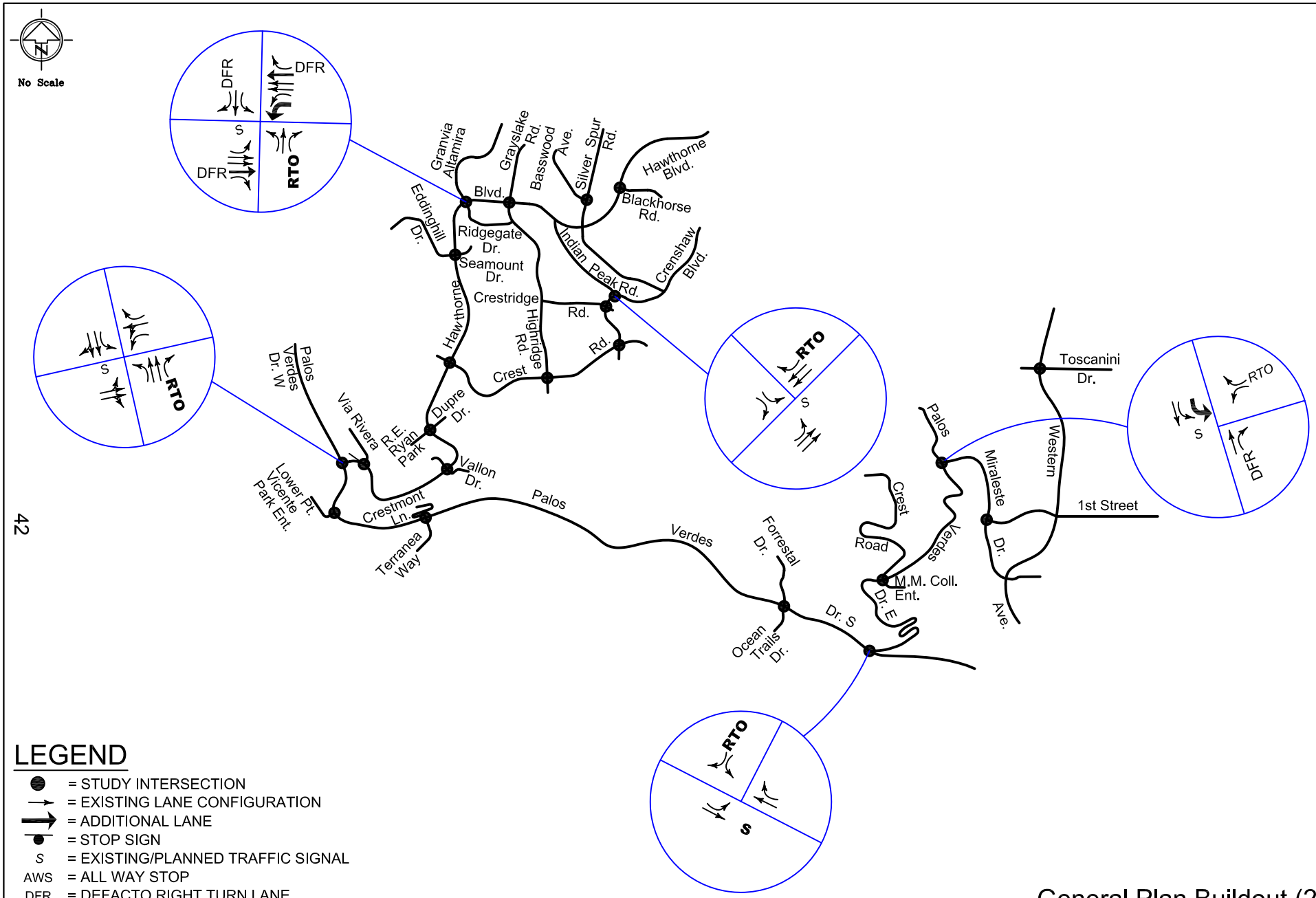
1 Add Right Turn Overlap Phasing to NB right turn lane on Palos Verdes Drive West

10 Add Right Turn Overlap Phasing to NB right turn lane on Highridge Road.

14 Add Right Turn Overlap Phasing to EB right turn lane on Indian Peak Road

18 Construct a second southbound left turn lane on Palos Verdes Drive East and add Right Turn Overlap Phasing to WB right turn lane on Miraleste Drive

20 Install a traffic signal at the intersection with Right Turn Overlap Phasing for the SB right turn lane



LEGEND

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- *S* = EXISTING/PLANNED TRAFFIC SIGNAL
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- *RTO* = PLANNED RIGHT TURN OVERLAP PHASING
- **RTO** = ADDED RIGHT TURN OVERLAP PHASING
- **S** = NEW TRAFFIC SIGNAL

General Plan Buildout (2035)
Additional Required Intersection Improvements
EXHIBIT 11

WILLDAN Engineering

14. Add right turn overlap phasing for the southbound right turn at the intersection of Crenshaw Boulevard/Indian Peak Road.

18. Construct a second southbound left turn lane at the intersection of Palos Verdes Drive East/Miraleste Drive.

20. Signalize the intersection of Palos Verdes Drive East/Palos Verdes Drive South and add right turn overlap phasing for the southbound right turn.

The levels of service as a result of the additional improvements are shown in ***Table 9***. The supporting ICU and HCM intersection analyses worksheets can be referenced in ***Appendix G.***

General Plan Buildout (2035) Conditions Roadway Segment Analysis

For General Plan Buildout conditions, daily traffic volumes are used to help determine the number of through lanes that will be needed for major circulation system roadways to meet the forecast traffic demand. The estimated daily traffic volumes for General Plan Buildout (2035) conditions are shown in previous ***Table 2***.

Planned Roadway Improvements

The City is planning several roadway improvements before 2035, particularly concerning Palos Verdes Drive East. The one that would affect the capacity of a study intersection is the reduction of through lanes on Palos Verdes Drive East from four lanes to two lanes with a median barrier, in the vicinity of Crest Road. It results in the new roadway classification of 2 Lane Divided, which was used in the General Plan Buildout analysis.

Roadway Segment Level of Service Analysis

The results of the roadway segment level of service analysis for General Plan Buildout (2035) conditions are summarized in ***Table 10***. ***Table 10*** shows that 10 of the segments are expected to continue to operate at LOS A, seven would operate at LOS B, two at LOS

TABLE 10

ROADWAY SEGMENTS LEVEL OF SERVICE SUMMARY

GENERAL PLAN BUILDOUT (2035) CONDITIONS WITH POSSIBLE IMPROVEMENTS[1]

STREET	SEGMENT	POSSIBLE LANE CONFIG	EXISTING DAILY VOLS (2010)	LEVEL OF SERVICE (LOS)[2]
Hawthorne Blvd.	North City Limit - Blackhorse Rd.	6D	36,897	B
	Blackhorse Rd. - Indian Peak Rd.	6D	34,712	B
	Indian Peak Rd. - Grayslake Rd./Highridge Rd.	8D	52,748	C
	Grayslake Rd./Highridge Rd. - Granvia Altamira/Ridgegate Dr.	6D	37,295	B
Miraleste Dr.	Palos Verdes Dr. E - 1st St.	4D	19,050	A
Palos Verdes Dr. E	North City Limit - Miraleste Dr.	4U	19,040	C
	Miraleste Dr. - North of Crest Dr.	2D	14,478	C

[1] Configuration required to achieve acceptable LOS of D or better.

[2] Level of Service based on the Road Capacity Values listed below, from the Orange County Transportation Authority, except for 2 Lanes Divided, which was not included in the table. Values for 2 Lanes Divided were calculated as one-half of the values for 4 Lanes Divided, based on the relationship of the values of 2 Lanes Undivided to 4 Lanes Undivided.

	LEVEL OF SERVICE					
TYPE OF ARTERIAL	A	B	C	D	E	F
8 Lanes Divided (8D)	45000	52500	60000	67500	75000	--
6 Lanes Divided (6D)	33900	39400	45000	50600	56300	--
4 Lanes Divided (4D)	22500	26300	30000	33800	37500	--
4 Lanes Undivided (UD)	15000	17500	20000	22500	25000	--
2 Lanes Divided (2D)	11300	13200	15000	16900	18800	--
2 Lanes Undivided (2U)	7500	8800	10000	11300	12500	--

Note: The Road Capacity Values are the maximum Average Daily Traffic for the given Level of Service.

C, three at LOS D, three at LOS E and four at LOS F. The segments that would operate at unacceptable LOS E are as follows:

- Hawthorne Boulevard – North City Limit to Blackhorse Road (Existing = LOS C)
- Hawthorne Boulevard – Blackhorse Road to Indian Peak Road (Existing = LOS B)
- Hawthorne Boulevard – Grayslake Road/Highridge Road to Granvia Altamira/ Ridgegate Drive (Existing = LOS C)

The segments that would operate at unacceptable LOS F are as follows:

- Hawthorne Boulevard – Indian Peak Road to Grayslake Road/Highridge Road (Existing = LOS F)
- Miraleste Drive – Palos Verdes Drive East to 1st Street (Existing = LOS D)
- Palos Verdes Drive East – North City Limit to Miraleste Drive (Existing = LOS F)
- Palos Verdes Drive East – Miraleste Drive to North of Crest Drive (Existing = LOS D)

Table 10 shows the lane improvements that would be needed for the levels of service of all roadway segments to meet the acceptable standard.

Daily traffic volumes have traditionally been used to determine levels of service for long-range or General Plan level conditions since transportation modeling of long-range conditions can only be approximated. In more recent years, however, transportation modeling has advanced, and intersection modeling of future conditions is typically used to determine future intersection improvements. Since, intersection capacity, rather than roadway segment capacity, usually determines the level of service of the roadways, the current practice in southern California is to primarily use the lane requirements established by the intersection analysis to determine future roadway needs.

Since one of the intersection improvements would require the possible roadway segment lane improvements shown in ***Table 10***, the third through lane in each direction at the

intersection of Grayslake Road-Highridge Road/Hawthorne Boulevard, it is recommended that the adjacent segments of Indian Peak Road to Grayslake Road/Highridge Road and Grayslake Road/Highridge Road to Granvia Altamira be upgraded to the 6 Lane Divided designation. Although the segment of Indian Peak Road to Grayslake Road/Highridge Road would be projected to operate at unacceptable LOS E with the upgrade, the intersection analysis indicates that the six lanes should be sufficient. It is recommended that none of the other possible improvements in ***Table 10*** be implemented. The roadway segments should operate at acceptable levels of service without additional roadway segment improvements.

General Plan Buildout (2035) Conditions Traffic Signal Warrant Analysis

A traffic signal warrant analysis was conducted for five unsignalized study intersections under General Plan Buildout (2035) conditions. The five intersections did not meet the traffic signal warrants for existing conditions.

The *California Manual of Uniform Traffic Control Devices* (CA MUTCD*)* Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form), to be used for new intersections or locations where it is not reasonable to count (such as future conditions), was used for General Plan Buildout (2035) conditions. The signal warrant analysis was based on the estimated daily traffic volumes for 2035 General Plan Buildout conditions. The analysis showed that the following four intersections meet this warrant:

- Hawthorne Boulevard (EW) and Via Rivera (NS)
- Palos Verdes Drive South (EW) and Forrestal Dr./Ocean Trails Dr. (NS)
- Palos Verdes Drive South (EW) and Palos Verdes Drive East (NS)
- Miraleste Drive (NS) and 1st Street (EW)

The traffic signal warrant worksheets are included in ***Appendix H***. The remaining intersection of Palos Verdes Drive South and Lower Point Vicente Park Entrance did not meet the traffic signal warrant.

V. ALTERNATE TRANSPORTATION MODES

Public Transit

Public bus transit services that currently operate in the City of Rancho Palos Verdes and serve the Palos Verdes Peninsula include Palos Verdes Transit, Los Angeles County Metro, City of Los Angeles Department of Transportation's Commuter Express and Beach Cities Transit. The bus routes, which service every major street in Rancho Palos Verdes, are illustrated on ***Exhibit 12***.

Trails (Bikeways, Pedestrian and Equestrian)

Conceptual Trails Plan and Conceptual Bikeways Plan

In 1993, the City Council approved the revised *Conceptual Trails Plan* for the City of Rancho Palos Verdes, which primarily focuses on equestrian and pedestrian trails. The *Conceptual Trails Plan* divides the City into five geographical sections although many trails traverse more than one section. The section maps, which illustrate the trails, are included in ***Appendix I***. The *Conceptual Bikeways Plan*, which was adopted in 1990 and revised in1996, complements the *Conceptual Trails Plan*. ***Exhibit 13*** illustrates the bikeway network developed in the *Conceptual Bikeways Plan*.

Preserve Trails Plan

In April 2008, the City Council adopted the *Preserve Trails Plan* (PTP) for the Palos Verdes Nature Preserve, which consists of 10 reserves. The *Preserve Trails Plan*, which was the initial and largest component of the *Public Use Master Plan* (PUMP), identifies the trail routes and trail uses in the Nature Preserve. The map of the Palos Verdes Nature Preserve, showing each reserve, and maps of the reserves are included in ***Appendix I***.

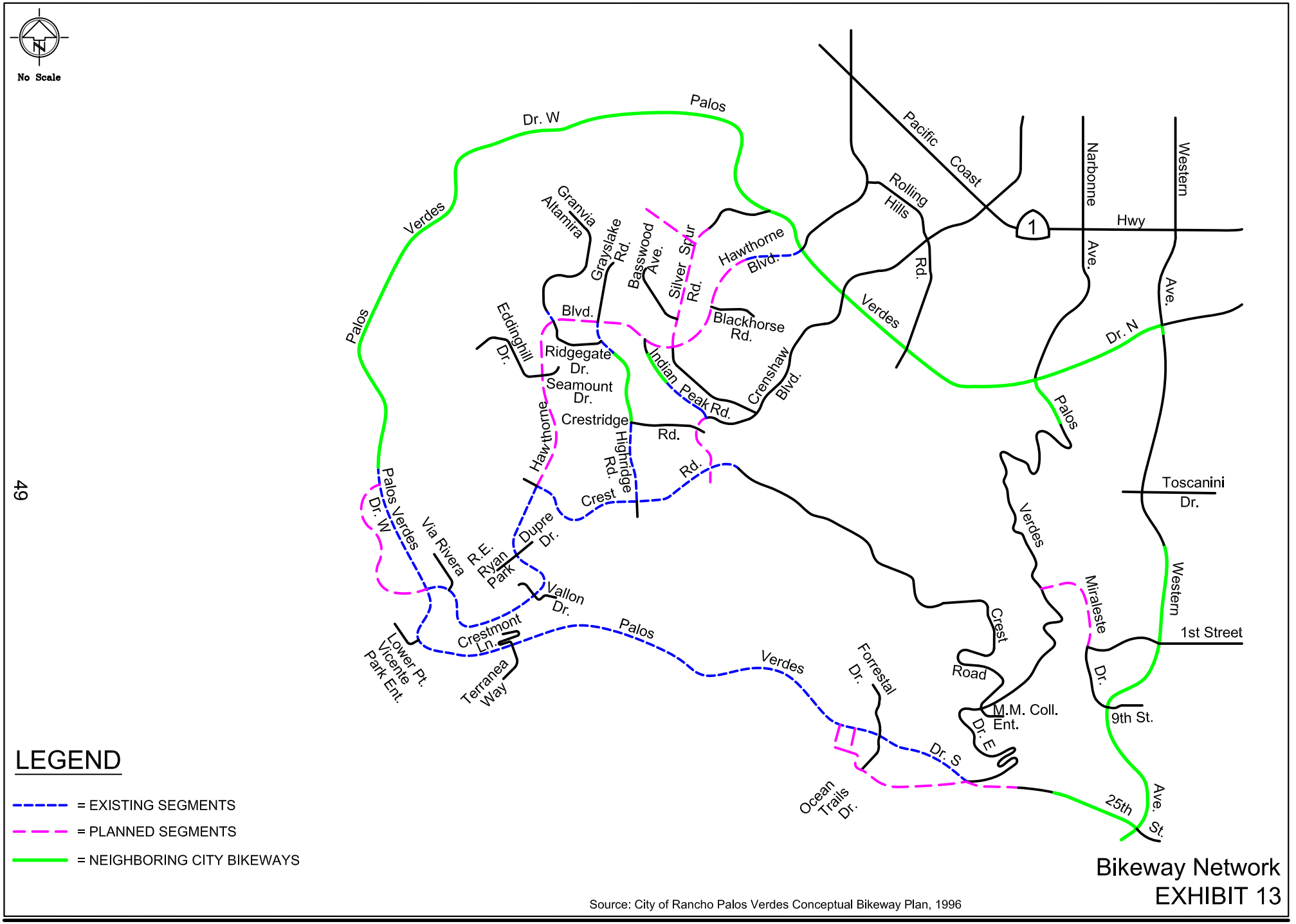
Rancho Palos Verdes Coast Vision Plan

The City's latest effort to enhance access to the City's natural areas is the Coast Vision Plan, which provides a vision, goals, concept designs and design guidance to be used to "cohesively link the key open space properties and public lands along the coast, including

No Scale

Existing Public Transit Routes
EXHIBIT 12

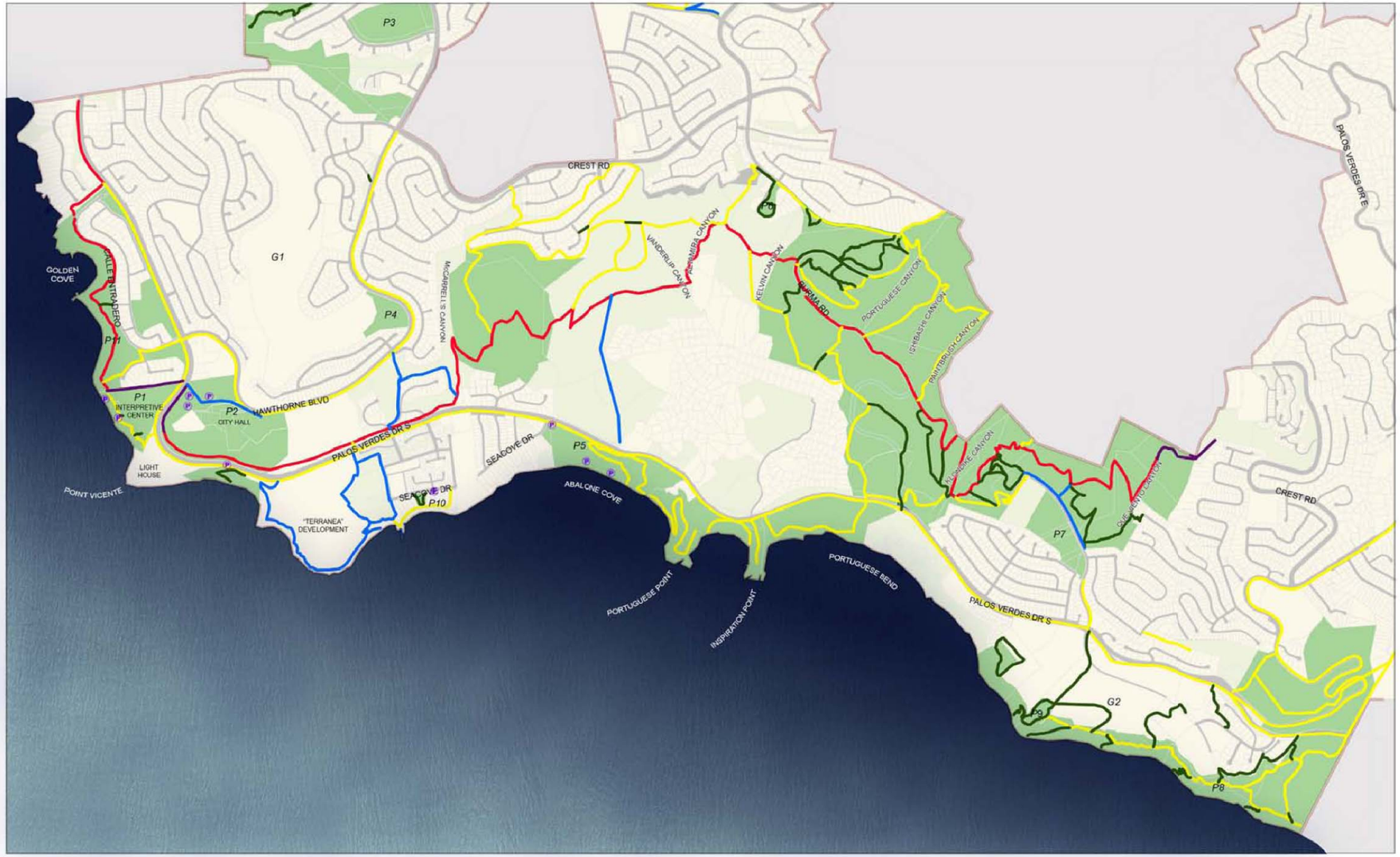
Source: Metropolitan Transit Authority (Metro)



Source: City of Rancho Palos Verdes Conceptual Bikeway Plan, 1996

Bikeway Network
EXHIBIT 13

the NCCP properties located within the Palos Verdes Nature Preserve. The public trails that have been incorporated into the Coast Vision Plan are shown on ***Exhibit 14***, from the Plan.



Conceptual Trails Plan
Conceptual Trails Plan: Loop Trail
Existing Trails: Not in Conceptual Trails Plan
Conceptual Trails Plan: Proposed Loop Trail
Conceptual Trails Plan: Proposed Trails

Public Open Space (City parks and NCCP land)
Public Parking Lots
Privately owned open space

P1 Lower Point Vicente Park
P2 Upper Point Vicente Park
P3 Hesse Park
P4 Ryan Park
P5 Abalone Cove Shoreline Park
P6 Del Cerro Park
P7 Ladera Linda Park
P8 Palos Verdes Shoreline Park
P9 Founders Park
P10 Frank A. Vanderlip, Sr. Park
P11 Oceanfront Park

G1 Los Verdes Golf Course
G2 Trump National Golf Course

ACCESS AND CIRCULATION

0' 1000' 2000' 3000' 4000' 5000'
0 1/4 mile 1/2 mile 3/4 mile 1 mile

N

RANCHO PALOS VERDES VISION PLAN & PUBLIC USE MASTER PLAN (PUMP)

EXISTING CONDITIONS

MELÉNDREZ

City of Rancho Palos Verdes
Palos Verdes Land Conservancy

SOURCE: THE RANCHO PALOS VERDES ***COAST VISION PLAN***, AUGUST 2008 DRAFT

Public Trails
EXHIBIT 14