CITY OF RANCHO PALOS VERDES GENERAL PLAN UPDATE

TRAFFIC IMPACT ANALYSIS

OCTOBER 22, 2018

PREPARED FOR :
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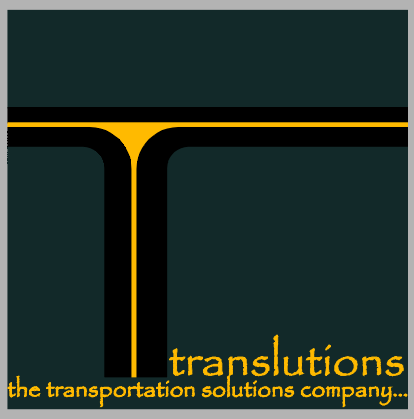

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TABLE OF CONTENTS

APPENDICES

FIGURES AND TABLES

FIGURES

TABLES

1.0 INTRODUCTION

The City of Rancho Palos Verdes (City) is located on the Palos Verdes Peninsula in southwestern Los Angeles County, California. It is generally bounded by the Pacific Ocean and Palos Verdes Estates to the west, the Pacific Ocean to the south, the City of Los Angeles to the east, and Rolling Hills and Rolling Hills Estates to the north. Figure 1 illustrates the regional location of the City.

Like many Cities in Southern California, traffic congestion is a concern for Rancho Palos Verdes residents and businesses. Although traffic on local roads is generally free-flowing, major thoroughfares, particularly the major routes connecting the community to the Palos Verdes Peninsula and to regional freeway systems, experience congestion at key intersections and along several segments during peak traffic hours. Integrated solutions that improve mobility for all modes of travel are needed, including enhancing the efficiency of existing roadways and the ability to walk, bicycle, and use transit.

The City of Rancho Palos Verdes General Plan emphasizes the maintenance of a street system that can meet the demands of the current and planned land uses. This study establishes acceptable levels of service and recommends improvements to maintain acceptable levels of service at major intersections and roadways within the City. The use of alternative travel modes such as transit, walking, and biking are also accommodated in the proposed network.

1.1 Purpose of the TIA and Study Objectives

This report presents the methodology, findings and conclusions of the Traffic Impact Analysis (TIA) conducted for the City of Rancho Palos Verdes General Plan Update. State Law requires that there should be consistency between the different elements of the General Plan. The primary objective of this report is to define a circulation system that supports the development anticipated in the Land Use Element and other elements of the updated General Plan. Thus, the proposed circulation system has been planned to achieve the levels of service (LOS) as described in the Circulation Element of the General Plan. This report also intends to satisfy the requirements for the disclosure of potential impacts and mitigation measures per the California Environmental Quality Act (CEQA).

1.2 Project Location & Study Area

The City is located on the Palos Verdes Peninsula in Los Angeles County, California. The City is approximately 13.5 square miles in total area and is in close proximity to the ports of Long Beach and Los Angeles. The City is bordered by Palos Verdes Estates on the northwest, Rolling Hills and Rolling Hills Estates to the northeast, Los Angeles to the east, and the Pacific Ocean to the south. Regional access to the City is provided by Interstate 110 (I-110), Pacific Coast Highway (State Route 1), and Western Avenue (State Route 213). The study area includes the following intersections and roadway segments:

Intersections

1. Palos Verdes Drive West/Hawthorne Boulevard;
2. Palos Verdes Drive West/Lower Point-Vicente Park Entrance;
3. Via Rivera/Hawthorne Boulevard;
4. Granvia Altamira-Ridgegate Drive/Hawthorne Boulevard;

Figure 1: Regional Project Location

5. Hawthorne Boulevard/Eddinghill Drive-Seamount Drive;
6. Hawthorne Boulevard/Crest Road;
7. Hawthorne Boulevard/Dupre Drive-R.E. Ryan Park Driveway;
8. Hawthorne Boulevard/Vallon Drive;
9. Crestmont Lane-Terranea Way/Palos Verdes Drive South;
10. Grayslake Road-Highridge Road/Hawthorne Boulevard;
11. Highridge Road/Crest Road;
12. Basswood Avenue/Montemalaga Drive;
13. Silver Spur Road/Hawthorne Boulevard;
14. Crenshaw Boulevard/Crestridge Road;
15. Crenshaw Boulevard/Indian Peak Road;
16. Crenshaw Boulevard/Crest Road;
17. Hawthorne Boulevard/Blackhorse Road;
18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South;
19. Palos Verdes Drive East/Palos Verdes Drive South;
20. Palos Verdes Drive East/Crest Road-Marymount College Driveway;
21. Palos Verdes Drive East/Via Canada;
22. Palos Verdes Drive East/Crownview Drive;
23. Palos Verdes Drive East/Miraleste Drive;
24. Miraleste Drive/1st Street;
25. Western Avenue/Avenida Aprenda;
26. Western Avenue/Delasonde Drive;
27. Western Avenue/Toscanini Drive;
28. Western Avenue/Caddington Drive;
29. Western Avenue/Crestwood Street; and
30. Seahill Drive-Tramonto Drive/Palos Verdes Drive South.

Roadway Segments

1. Hawthorne Boulevard between the North City Limit and Blackhorse Road;
2. Hawthorne Boulevard between Blackhorse Road and Silver Spur Road;
3. Hawthorne Boulevard between Grayslake Road - Highridge Road and Indian Peak Road;
4. Hawthorne Boulevard between Grayslake Road - Highridge Road and Granvia Atlamira - Ridgegate Drive;
5. Hawthorne Boulevard between Granvia Atlamira - Ridgegate Drive and Eddinghill Drive - Seamount Drive;
6. Hawthorne Boulevard between Eddinghill Drive - Seamount Drive and Crest Road;
7. Hawthorne Boulevard between Crest Road and Vallon Drive;
8. Hawthorne Boulevard between Vallon Drive and Palos Verdes Drive West;
9. Palos Verdes Drive West between the North City Limit and Hawthorne Boulevard;
10. Palos Verdes Drive West between Hawthorne Boulevard and Palos Verdes Drive South;

11. Palos Verdes Drive South between Palos Verdes Drive West and Crestmont Lane - Terranea Way;
12. Palos Verdes Drive South between Crestmont Lane - Terranea Way and Narcissa Drive;
13. Palos Verdes Drive South between Narcissa Drive and Palos Verdes Drive East;
14. Palos Verdes Drive South between Palos Verdes Drive East and the East City Limit;
15. Palos Verdes Drive East between the North City Limit and Miraleste Drive;
16. Palos Verdes Drive East between Miraleste Drive and Crest Road;
17. Palos Verdes Drive East between Crest Road and Ganado Drive;
18. Palos Verdes Drive East between Ganado Drive and Palos Verdes Drive South;
19. Crenshaw Boulevard between the North City Limit and Indian Peak Road;
20. Crenshaw Boulevard between Indian Peak Road and Crest Road;
21. Crenshaw Boulevard south of Crest Road;
22. Crest Road between Hawthorne Boulevard and Highridge Road;
23. Crest Road between Highridge Road and Crenshaw Boulevard;
24. Crest Road between Ganado Drive and Northern City Limits;
25. Crest Road between Palos Verdes Drive East and Ganado Drive;
26. Crestridge Road between Highridge Road and Crenshaw Boulevard;
27. Highridge Road between Hawthorne Boulevard and the City Limit with Rolling Hills Estates;
28. Indian Peak Road between Crenshaw Boulevard and the City Limit with Rolling Hills Estates;
29. Miraleste Drive between Palos Verdes Drive East and Via Colinita;
30. Miraleste Drive between Via Colinita and City's Limit at 9th Street;
31. Montemalaga Road between Silver Spur Road and Rolling Hills Estates City Limits;
32. Silver Spur Road between the North City Limit and just north of Hawthorne Boulevard;
33. Silver Spur Road between Hawthorne Boulevard and Dry Bank Road;
34. Western Avenue between the North City Limit and Delasonde Drive;
35. Western Avenue between Delasonde Drive and Trudie Drive; and
36. Western Avenue between Trudie Drive and South City Limit.

Figure 2 illustrates the study area intersections and roadway segments included in the TIA.

1.3 Analysis Scenarios

This study analyzes existing and the proposed General Plan Build Out (year 2040) conditions. This TIA analyzes weekday a.m. and p.m. peak hour conditions. The a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. The p.m. peak hour is defined as the one hour of highest traffic volumes occurring between 4:00 and 6:00 p.m. At the request of City Staff, intersection traffic operations during the a.m. and midday peak hour conditions on Saturday were also included in this analysis. The a.m. peak hour for Saturday is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. The

midday peak hour for Saturday is defined as the one hour of highest traffic volumes occurring between 11:00 a.m. and 1:00 p.m.

Level of service (LOS) is a measure of the quality of operational conditions within a traffic stream, and is generally expressed in terms of such measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Levels range from A to F, with LOS A representing excellent (free-flow) conditions and LOS F representing extreme congestion. The Los Angeles Congestion Management Program (CMP) uses Intersection Capacity Utilization (ICU) methodologies for traffic analyses. However, ICU is based upon the critical

Figure 2: Study Area Intersections and Roadway Segments

flow ratio (ICU) for the intersection, and is designed to be insensitive to the actual signal timing for the intersection. Since the opportunity of adding more capacity (i.e. more lanes) to improve traffic operations on roadways such as Hawthorne Boulevard is low, transportation system strategies such as signal coordination and prioritization were considered as feasible improvements. The Highway Capacity Manual (HCM) can be used since it is receptive to signal timing and corridor wide analyses to maximize traffic flow. Therefore, based on consultation with City staff, HCM procedures have been used to evaluate levels of service at signalized intersections on Hawthorne Boulevard and at all un-signalized intersections. The remaining signalized intersections use ICU procedures to evaluate levels of service. This section discusses the LOS definitions, procedures, and thresholds used in this report.

2.1 Intersection Levels of Service

The analysis of traffic operations at signalized intersections on Hawthorne Boulevard, Western Avenue, and all un-signalized intersections was conducted according to the Highway Capacity Manual 6th Edition (HCM) delay methodologies, which is described in the Highway Capacity Manual (Transportation Research Board, Washington, D.C., December 2016). Under the HCM methodology, LOS for signalized intersections is based on the average delay experienced by vehicles traveling through an intersection, whereas for un-signalized intersections, the LOS is based on the worst approach where the minor leg has a shared lane and on the worst movement where the minor leg has dedicated turn lanes. Traffic operations at all remaining signalized intersections was conducted according to the ICU methodologies. The ICU values represent volume/capacity (v/c) ratios for the peak hours, providing a measure of system performance. Table A presents a brief description of each level of service letter grade, as well as the HCM range of delays and ICU v/c ratios associated with each grade.

Table A: Levels of Service Criteria

LOS	Description of Drivers ' Perception and Traffic Operation	HCM (Delay in Seconds)		ICU (v/c ratio)
		Unsignalized	Signalized	
A	This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤ 10	≤ 10	0.00-0.60
B	This level is assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	> 10 and ≤ 15	> 10 and ≤ 20	0.61-0.70

C	This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	> 15 and ≤ 25	> 20 and ≤ 35	0.71-0.80
D	This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	> 25 and ≤ 35	> 35 and ≤ 55	0.81-0.90
E	This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	> 35 and ≤ 50	> 55 and ≤ 80	0.91-1.00
F	This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	> 50	> 80	>1.0

Source: *Highway Capacity Manual, 2016/2010 LA County CMP*

2.2 Segment Roadway Levels of Service

The traffic analysis of operations on roadway segments was conducted by comparing the daily traffic volumes to the maximum roadway capacity of each facility type. The maximum roadway capacity is a measure of a streets ability to meet the vehicular demand that is placed on it. Table B identifies the maximum daily capacity values for each roadway type. These daily capacities were developed consistent with HCM *Chapter 16, Urban Street Facilities*, which provides a methodology for developing generalized daily service volumes based on daily volumes and applying k-factors (proportion of daily volume that occurs during the peak hour) and d-factors (proportion of traffic moving in peak direction of travel). The v/c ratios listed in Table A represent the level of service criteria for roadway segments.

Table B: Roadway Segment Capacities

Classification	Maximum Two-Way Daily Traffic Volume (LOS E)
4-Lane Divided Arterial	36,100

2-Lane Divided Arterial	17,900
2-Lane Undivided Arterial	17,000
4-Lane Undivided Collector	34,300
2-Lane Divided Collector	17,900

2.3 Levels of Service Thresholds

The CMP standard level of service for intersections is LOS E. However, local jurisdictions are allowed to use a stricter LOS standard. The City uses LOS D as the minimum level of service standard for roadway segment and intersection operations. Therefore, study intersections and roadway segments operating at LOS E of F are mitigated to LOS D or better.

3.0 REGIONAL PLANS AND PROGRAMS

Circulation is a regional issue and local circulation is always linked with the regional system. Transportation analyses are therefore conducted in cognizance of the regional circulation planning process. The following plans and programs are related to the General Plan:

3.1 County of Los Angeles Congestion Management Program

All urbanized areas within the state of California are required to have a Congestion Management Agency (CMA), whose primary responsibility is to put programs in place to keep traffic operations satisfactory by assisting in the coordination of land use, air quality and transportation planning among the local jurisdictions and to prepare a Congestion Management Program (CMP). The Los Angeles County Metro (Metro) is the CMA for Los Angeles County, and reports annual findings to the Southern California Association of Governments (SCAG) for a finding of regional consistency.

3.2 SCAG Regional Transportation Plan

The Regional Transportation Plan (RTP) is a component of the Regional Comprehensive Plan and Guide prepared by SCAG to address regional issues, goals, objectives, and policies for the Southern California region until 2035. The RTP is periodically updated by SCAG to address changing conditions in the five-county SCAG region (Los Angeles, Riverside, San Bernardino, Orange, and Kern Counties), and is developed with participation from local agencies throughout the region. The RTP sets broad goals for the region and provides strategies to reduce congestion and increase mobility options. On April 4, 2012, the SCAG Regional Council adopted the *2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future*. The SCS is a newly required element of the RTP. The SCS will integrate land use and transportation strategies that will achieve the emissions reduction targets set by the California Air Resources Board (CARB).

3.3 California Complete Streets Act

The California Complete Streets Act (2008) requires "*that the legislative body of a city or county, upon any substantive revision of the circulation element of the general plan, modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users [including] motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation….*" This provision of the law went into effect on January 1, 2011. The law also required the Governor's Office of Planning and Research to amend its guidelines for the development of circulation elements so as to assist cities and counties in meeting the requirement.

3.4 Caltrans Complete Streets Implementation Action Plan

State and federal laws require Caltrans and local agencies to promote and facilitate increased bicycling and walking. The California Vehicle Code (CVC) and Streets and Highways Code identify the rights of bicyclists and pedestrians, and establish legislative intent that people of all ages using all types of mobility devices are able to travel on roads. Caltrans manuals and guidance outline statutory requirements, planning policy, and project delivery procedures to facilitate multimodal travel, which includes connectivity to public transit for bicyclists and pedestrians. A complete street matches the needs of travelers to the uses surrounding a street. It provides safe travel for people using any legal mode of travel, including bicycling, walking, riding transit, and driving. As part of the Complete Streets Implementation Action Plan, Caltrans encourages local agencies to include bicycle, pedestrian, and transit elements in regional and local planning documents, including general plans, transportation plans, and circulation elements.

4.0 PROPOSED GENERAL PLAN

The General Plan is a comprehensive update of the 2010 General Plan. While the General Plan update may contain similar goals, policies, or other components of the previous plan, this Plan has been updated to meet the needs and issues of the City at the present time and foreseeable future. The purpose of the General Plan is to provide the City Council, Planning Commission, Staff, and the entire community with a comprehensive and internally consistent plan to guide the City's decision-making and development processes through to the General Plan Horizon Year (2040).

The General Plan update provides an opportunity to formulate a land use plan and associated policies and programs and to inform appropriate land use decisions for the City for the next 20 years. Based on field reconnaissance, a review of existing General Plan and Zoning patterns, and discussion with City staff, the Land Use Plan designates 756 dwelling units for new residential development. The Land Use Map that is included within the Land Use Element establishes the desired pattern of growth in the City of Rancho Palos Verdes and its sphere of influence. It provides guidance to achieve the community's vision for how lands are to be used, the intensity and physical form of growth, and key design expectations. The permitted density and intensity of each land use designation is contained in Appendix A.

5.0 VOLUME DEVELOPMENT METHODOLOGY

Forecast traffic volumes at study intersections were developed based on discussion with City staff and uses the Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) model as the basis. This section discusses the methodology used to develop traffic volumes used in the analysis.

5.1 Existing Weekday and Saturday Intersection Traffic Volumes

Intersection operations during the weekday a.m. and p.m. peak hour conditions and Saturday a.m. and midday peak hour conditions were included in this report. The existing weekday and Saturday intersection traffic volumes are based on a.m. and p.m. peak hour intersection turn movement counts collected by National Data and Surveying Services in November 2016. Saturday counts were conducted on the Saturday of Veteran's Day. Since, Rancho Palos Verdes is a major tourist destination for active transportation users, conducting traffic counts on a long weekend provides higher traffic volumes than a typical weekend day. Count sheets are contained in Appendix B. Vehicle classification counts (e.g., passenger vehicle, 2-axle truck, 3-axle truck, and 4 or more axle truck), including pedestrian and bicycle counts were conducted at all analysis intersections. Passenger car equivalents (PCEs) account for the larger impact of trucks on traffic operations. It does so by assigning trucks a PCE factor that represents the number of passenger vehicles that could travel through an intersection in the same time a truck could. For this analysis, trucks have been assigned a PCE factor of 2.5, which is consistent with the HCM methodologies. Detailed volume development worksheets are included in Appendix C. Figures 3 illustrates the existing intersection geometrics and stop control at the study area intersections. The existing weekday a.m. and p.m. peak hour traffic volumes for the study area intersections are illustrated in Figure 4. The existing Saturday a.m. and midday peak hour traffic volumes for six study area intersections are illustrated in Figure 5.

Figure 3: Existing Intersection Geometrics and Stop Control

Figure 4: Existing Weekday Peak Hour Intersection Traffic Volumes

Figure 5: Existing Saturday Peak Hour Intersection Traffic Volumes

5.2 Existing Weekday Roadway Segment Traffic Volumes

The existing weekday traffic volumes at study area roadway segments are based on traffic counts collected by National Data and Surveying Services in November 2016. Count sheets are contained in Appendix B. Vehicle classification counts (e.g., passenger vehicle, 2-axle truck, 3-axle truck, and 4 or more axle truck) were conducted at all analysis roadway segments. Trucks have been assigned a PCE factor of 2.5. Detailed volume development worksheets are included in Appendix C.

Table C shows the existing weekday traffic volumes at study area roadway segments.

5.3 General Plan Build Out Weekday and Saturday Intersection Traffic Volumes

The proposed General Plan Build Out traffic volume forecasts were developed using future traffic projections from the 2012 Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) and refined to include data from the City of Rancho Palos Verdes Land Use Element. The Traffic Analysis Zone structure within the City was refined to include updated zone boundaries based on current and future land uses.

The intersection traffic volumes for General Plan Build Out weekday conditions were developed using the 2012 SCAG RTP base year and future year model networks. Raw traffic model data from the 2012 SCAG RTP base and future year model runs were post-processed using National Cooperative Highway Research Program (NCHRP) 255 methodologies to develop peak-hour turning movement volumes at each study area intersection. The following describes the methodology used to post-process model volumes to develop peak hour intersection volumes for General Plan Build Out conditions:

The base year for the traffic model is 2008 and the forecast year is 2035. The difference between the modeled 2008 and 2035 peak period directional arterial traffic volumes (for each intersection approach and departure) was identified from loaded network model plots. This difference defines the growth in traffic over the 27-year period. This incremental growth in peak period approach and departure volumes was factored to develop the incremental change in peak hour volumes. The 2012 SCAG RTP uses a three-hour a.m. peak period and a four-hour p.m. peak period. SCAG, the regional Metropolitan Transportation Organization (MPO) has established that the a.m. peak hour comprises 38 percent of the a.m. peak period and that the p.m. peak hour comprises 28 percent of the p.m. peak period. Therefore, the incremental changes in peak period volumes were multiplied by the appropriate factor to develop incremental changes in peak hour volumes. The incremental growth in approach and departure volumes between 2008 and 2035 was factored to reflect the forecast growth between the year of the ground counts (2016) and 2040. For this purpose, linear growth between 2008 and forecast 2035 (and beyond) was assumed. Since the increment between 2016 and 2040 is 24 years of the 27-year time span, a factor of 0.89 (i.e., 24/27) was used. This forecast growth in approach

and departure volumes were added to the 2016 ground counts, resulting in post-processed General Plan Build Out 2040 link volumes.

General Plan Build Out weekday turn volumes were developed using existing turn volumes and the future approach and departure volumes, based on the methodologies contained in *National Cooperative Highway Research Program Report (NCHRP) 255: Highway Traffic Data for Urbanized Area Project Planning and Design* (Transportation

Table C: Existing Weekday Roadway Segment Daily Traffic Volumes

Research Board, December 1982). At some locations, forecast turning movements were forecast to be less than those under existing conditions. This can be attributed to network improvements or changes in land use. To present a more conservative analysis, General Plan Build Out turning movements lower than those forecasted based on the 2012 SCAG RTP have been adjusted by applying a growth rate based on the average growth rates forecast in the Los Angeles County CMP for Palos Verdes. The General Plan Build Out Saturday turn volumes were developed based on the average growth rates forecast in the Los Angeles County CMP for Palos Verdes. Detailed volume development worksheets are included in Appendix C.

The General Plan Build Out weekday a.m. and p.m. peak hour traffic volumes for the study area intersections are illustrated in Figure 6. The General Plan Build Out Saturday a.m. and midday peak hour traffic volumes for six study area intersections are illustrated in Figure 7.

5.4 General Plan Build Out Roadway Segment Traffic Volumes

The roadway segment volumes for General Plan Build Out conditions were developed using the same methodology described under “General Plan Build Out Weekday and Saturday Intersection Traffic Volumes”. Detailed volume development worksheets are included in Appendix C.

Table D shows the General Plan Build Out weekday traffic volumes at study area roadway segments.

6.0 EXISTING CONDITIONS ANALYSIS

This section discusses the existing transportation conditions in the study area.

6.1 Existing Roadway Network Conditions

As stated earlier, regional access to the City is provided by the I-110, Pacific Coast Highway, and SR-213. The roadway network within the City can be classified into four categories according to the type of service they are intended to provide. The four basic roadway classifications are described below:

Freeway: Although there are no freeways in the City, access to I-110 and I-405 are key links to commuters who travel regionally.

Arterial: An Arterial roadway is a roadway primarily for through traffic to which access from abutting property is kept at a minimum. Arterials in the City are two-lane and four-lane roadways with raised or painted medians. Arterials usually connect to other Arterials and highways and disperse traffic from Collector roadways.

Collector: A Collector roadway is intended to serve residential areas or commercial areas and convey traffic through an area to roads of equal or higher classification. Collectors are two-lane and four-lane undivided roadways in the City.

Local: A Local roadway provides access to abutting property with driveway access and are two-lane undivided roadways.

Figure 6: General Plan Build Out Weekday Peak Hour Intersection Traffic Volumes

Figure 7: General Plan Build Out Saturday Peak Hour Intersection Traffic Volumes

Table D: General Plan Build Out Weekday Roadway Segment Daily Traffic Volumes

The major roadways within the City are discussed below:

Hawthorne Boulevard runs in a north-south direction within the City. Hawthorne Boulevard is a four-lane divided Arterial roadway with turn lanes at some intersections and a posted speed limit of 45 miles per hour (mph).

Palos Verdes Drive West: Palos Verdes Drive West runs in a north-south direction within the City. Palos Verdes Drive West is a four-lane divided Arterial roadway with turn lanes at some intersections and a posted speed limit of 45 mph.

Palos Verdes Drive South: Palos Verdes Drive South runs in an east-west direction within the City. Palos Verdes Drive South is a four-lane divided Arterial roadway from Palos Verdes Drive West to Crestmont Lane-Terranea Way and a two-lane divided Arterial roadway from Narcissa Drive to the Eastern City limits. The posted speed limit on Palos Verdes Drive South is 45 mph.

Palos Verdes Drive East: Palos Verdes Drive East runs in a north-south direction within the City. Palos Verdes Drive East is a two-lane undivided Arterial roadway from the Northern City limits to Crest Road, a two-lane divided Arterial from Crest Road to Ganado Drive, and a two-lane undivided Arterial from Ganado Drive to Palos Verdes Drive South. The posted speed limit on Palos Verdes Drive East ranges from 30 to 40 mph.

Crenshaw Boulevard: Crenshaw Boulevard runs in an east-west direction within the City. Crenshaw Boulevard is a four-lane divided Arterial roadway from the Northern City limits to Crest Road and a two-lane undivided Arterial south of Crest Road. The posted speed limit on Crenshaw Boulevard is 45 mph.

Crest Road: Crest Road runs in an east-west direction within the City. Crest Road is a four-lane Arterial roadway from Hawthorne Boulevard to Crenshaw Boulevard, a two-lane undivided Arterial from Ganado Drive to the Northern City limits, and a four-lane undivided Collector from Palos Verdes Drive East to Ganado Drive. The posted speed limit on Crest Road is 40 mph on the Arterial roadway and 25 mph on the Collector roadway.

Crestridge Road: Crestridge Road runs in an east-west direction within the City. Crestridge Road is a two-lane undivided Arterial roadway. The posted speed limit on Crestridge Road is 40 mph.

Highridge Road: Highridge Road runs in a north-south direction within the City. Highridge Road is a two-lane undivided Arterial roadway with a posted speed limit of 35 mph.

Indian Peak Road: Indian Peak Road runs in a north-south direction within the City. Indian Peak Road is two-lane divided Collector roadway with a posted speed limit of 35 mph.

Miraleste Drive: Miraleste Drive runs in a north-south direction within the City. Miraleste Drive is a two-lane divided Arterial roadway with a posted speed limit of 35 mph.

Montemalaga Road: Montemalaga Road runs in an east-west direction within the City. Montemalaga Road is a two-lane divided Arterial roadway with a posted speed limit of 35 mph.

Silver Spur Road: Silver Spur Road runs in a north-south direction within the City. Silver Spur Road is a three-lane divided Arterial roadway from the Northern City limits to Hawthorne Boulevard and a four-lane Arterial roadway from Hawthorne Boulevard to Dry Bank Road. The posted speed limit ranges from 35 to 45 mph.

Western Avenue: Western Avenue runs in a north-south direction. Western Avenue is a four-lane divided Arterial roadway with a posted speed limit of 35 mph.

Figure 8 shows the major roadways and their classifications in the City.

6.2 Existing Transit Service

Public transportation services for residents within the City and Palos Verdes Peninsula are provided by fixed-route and demand-response services. Fixed-route services include transit services in which vehicles run along an established path at preset times. Demand-response services are any non-fixed-route services that transport individuals with advanced scheduling by the rider. These services are further described below.

Fixed-route services in the City are provided by the Palos Verdes Peninsula Transit Authority (PVPTA). Services provided by PVPTA are funded by the Cities of Palos Verdes Estates, Rancho Palos Verdes, Rolling Hills Estates, Los Angeles County and the City of Los Angeles. The PVPTA services include the following fixed-routes:

- The Blue/Silver/White fixed-route lines provide local bus service generally in a north/south direction throughout the Palos Verdes Peninsula between 7:00 AM and 9:00 PM Monday through Friday with no weekend service.
- The Green/Green Eastview fixed-route lines provide local bus service generally in an east/west direction throughout the Palos Verdes Peninsula between 7:00 AM and 6:00 PM Monday through Friday with no weekend service.
- The Gold/Orange fixed-route lines provide local bus service generally in an east/west direction throughout the Palos Verdes Peninsula between 6:30 AM and 5:30 PM Monday through Friday with no weekend service.
- The 225/226 fixed-route lines provide local/regional bus service generally in a north/south direction throughout the Palos Verdes Peninsula between 6:00 AM and 9:00 PM Monday through Friday with no weekend service.

Demand-response services include Dial-A-Ride, an origin to destination reservation transportation service. Dial-A-Ride vehicles travel throughout the Palos Verdes Peninsula seven days a week/24 hours a day and include destinations off the Palos Verdes Peninsula for medical purposes only.

Figure 9 illustrates the fixed-route transit services and bus stop locations. As shown in Figure 9, fixed-route services are available on most major roadways within the City.

6.3 Existing Bicycle Facilities

The City's vision for bicycle mobility includes a planned system that promotes a safe and efficient network that provides connectivity within the City and Peninsula, but also to the regional bicycle facilities of adjacent jurisdictions. Bicyclists need to travel on a seamless bicycle network and need to feel safe when using the facilities by having

Figure 8: Existing Roadway Classifications

Figure 9: Public Transit

sufficient separation from vehicles. The *Three Feet for Safety Act,* which was incorporated into the California Vehicle Code in September 2014, requires motorists overtaking or passing a bicycle in the same direction to leave a minimum distance of three feet between the motor vehicle and bicyclist. By designing bicycle facilities that include 3-foot buffers, bike stations, water facilities, and other desirable amenities, the promotion of commuter travel by bicycle is encouraged.

The City's existing bicycle facilities are documented in the *Conceptual Bikeways Plan* adopted by the City Council in 1990 and revised in 1996. The bicycle classifications included are discussed below:

- **Class I:** A Class I bikeway is a special pathway designated for the exclusive use of bicycles. Crossflows by pedestrians and motorists are minimized. It is usually separated from motor vehicle facilities by a space or physical barrier. It is usually grade separated, but it may have street crossings at designated traffic markings. It can be used in both directions and is located on one side of the street. Class I bikeways are also referred to as "bike paths".
- **Class II:** A Class II bikeway, or "bike lane", is a lane on the paved area of a road for preferential use by bicycles. It is usually located along the edge of the paved area outside the traveled lanes or between the parking lane and the first motor vehicle lane. It is identified by limited "bike lane" or "bike route" signing, special lane lines, bicycle symbols or "bikes only" stencils on the pavement, and other pavement markings or signs deemed appropriate to give adequate instructions to bicyclists. Bike lanes are used only in the same direction of motor vehicle flow and, therefore, must be on both sides of the street.
- **Class III:** A Class III bikeway, or "shared route", is a roadway identified as a bicycle facility by "bike route" signing only. There are no special lane markings, and bicycle traffic shares the roadway with motor vehicles. Special regulations may be enacted and posted along such facilities to control motor vehicular speeds or restrict parking to enhance bicycle safety. Class III lanes are mainly to provide continuity in the bikeway system by connecting discontinuous segments of Class I and/or Class II facilities, or to provide a link to specific destination points. Bike lane, is a lane on the paved area of a road for preferential use by bicycles. It is usually located along the edge of the paved area outside the traveled lanes or between the parking lane and the first motor vehicle lane. It is identified by limited "bike lane" or "bike route" signing, special lane lines, bicycle symbols, or "bikes only" stencils on the pavement, and other pavement markings or signs deemed appropriate to give adequate instructions to bicyclists. Bike lanes are used only in the same direction of motor vehicle flow and, therefore, must be on both sides of the street.

The existing weekday a.m. and p.m. peak hour bicycle volumes for the study area intersections are illustrated in Figure 10. As shown in Figure 10, the peak hour bicycle volumes at the study area intersections are low. The existing bicycle facilities are illustrated in Figure 11. As shown in Figure 11, the majority of the study area roadway segments include existing bicycle facilities. However, gaps in bicycle facilities on major roadways are located on Hawthorne Boulevard from

the northern City limits to Indian Peak Road, Crenshaw Boulevard from the northern City limits to Crest Road, Silver Spur Road from Montemalaga Road to Hawthorne Boulevard, and Miraleste Drive from Palos Verdes Drive East to Via Colinita.

6.4 Existing Trail Facilities

The City offers pedestrian, bicycle, equestrian, and multi-purpose trails that connect recreational, commercial, and education activity centers with the vast areas of open space and natural preserves

Figure 10: Existing Weekday Peak Hour Bicycle Volumes

Figure 11: Bicycle Facilities

throughout the City and Peninsula. The City's trail network is planned and implemented through several documents including the Public Use Master Plan, the Coast Vision Plan, the Natural Community Conservation Plan, and the Conceptual Trails Plan. Figure 12 illustrates the trails within the City and Peninsula. As shown in Figure 12, there are equestrian trails throughout the Peninsula including the Equestrian Zone on Palos Verdes Drive East, which has a high presence of equestrians that utilize the trail system.

Pedestrian circulation in Rancho Palos Verdes is also provided via sidewalks. Sidewalks provide safe passage for pedestrians by creating a right-of-way that is separate from vehicular traffic. They provide direct connections to activity centers throughout the City including schools, shopping centers, recreation areas, and government buildings. Sidewalks also provide pedestrian connections to transit services since most transit trips begin and end with pedestrian trips.

The existing pedestrian sidewalks on study area roadway segments are illustrated in Figure 13. As shown in Figure 13, study are roadway segments that currently don't include pedestrian sidewalks are located on Palos Verdes Drive West, Palos Verdes Drive South, Hawthorne Boulevard, Palos Verdes Drive East, and Crest Road. The existing weekday a.m. and p.m. peak hour pedestrian volumes for the study area intersections are illustrated in Figure 14.

6.5 Vehicular and Pedestrian Collisions

Vehicular collision data within Rancho Palos Verdes for 2015 was obtained from the City and contained in Appendix E. The traffic accident data from 2015 was reviewed to determine if any clusters of accidents occur that may indicate a traffic collision problem area. Figure 15 illustrates the location of vehicle-only collisions in the City. As shown in Figure 15, three or more multiple vehicle-only collisions occurred at the following locations:

- Granvia Altamira-Ridgegate Drive/Hawthorne Boulevard;
- Grayslake Road-Highridge Road/Hawthorne Boulevard;
- Ravenspur Drive/Hawthorne Boulevard;
- Hawthorne Boulevard/Eddinghill Drive-Seamount Drive;
- Hawthorne Boulevard/Crest Road;
- Crenshaw Boulevard/Crestridge Road;
- Crenshaw Boulevard/Crest Road;
- Palos Verdes Drive West/Hawthorne Boulevard;
- Palos Verdes Drive West/Lower Point-Vicente Park Entrance;
- Peninsula Racquet Club Entrance/Hawthorne Boulevard;
- Western Avenue/Delasonde Drive;
- Western Avenue/Caddington Drive; and
- Miraleste Drive/Via Colinita.

The City's unique location, topography, and recreational facilities attract numerous bicyclists and pedestrians every year. These bicyclists and pedestrians together with heavy traffic on major roadways can result in vehicle/pedestrian

Figure 12: Trails Network

Figure 13: Existing Sidewalks

Figure 14: Existing Weekday Peak Hour Pedestrian Volumes

Figure 15: Vehicle and Pedestrian Collisions

conflicts. Traffic accident data from 2015 was reviewed to determine if any locations where vehicle-pedestrian collisions occurred may indicate a problem area. Figure 15 illustrates the location of vehicle-pedestrian collisions in the City.

6.6 Existing Weekday Intersection Levels of Service

An intersection level of service analysis was conducted for existing weekday conditions to determine current circulation system performance. The existing weekday levels of service for the study area intersections are summarized in Table E. Level of service calculation worksheets are contained in Appendix D. As shown in Table E, all study area intersections are currently operating at satisfactory levels of service, with the exception of the following intersections:

3. Via Rivera/Hawthorne Boulevard - a.m. and p.m. peak hours;
18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South - a.m. and p.m. peak hours;
19. Palos Verdes Drive East/Palos Verdes Drive South - a.m. and p.m. peak hours;
21. Palos Verdes Drive East/Via Canada - a.m. peak hour; and
23. Palos Verdes Drive East/Miraleste Drive - a.m. and p.m. peak hours.

Figures 16 and 17 illustrate the locations of the study area intersections and corresponding a.m. and p.m. peak hour levels of service under existing weekday conditions.

6.7 Existing Saturday Intersection Levels of Service

An intersection level of service analysis was conducted for six study intersections under existing Saturday conditions to determine current circulation system performance. The existing Saturday levels of service for the study area intersections are summarized in Table E. Level of service calculation worksheets are contained in Appendix D. As shown in Table E, all study area intersections are currently operating at satisfactory levels of service, with the exception of the following:

18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South - midday peak hour; and
19. Palos Verdes Drive East/Palos Verdes Drive South - midday peak hour.

Figures 18 and 19 illustrate the locations of the study area intersections and corresponding a.m. and p.m. peak hour levels of service under existing Saturday conditions.

6.8 Existing Weekday Roadway Segment Levels of Service

A level of service analysis was conducted at study area roadway segments for existing weekday conditions to determine current circulation system performance. The existing weekday levels of service for the study area roadway segments are summarized in Table F. Level of service calculation worksheets are contained in Appendix D. As shown in Table F, all study area roadway segments are currently operating at satisfactory levels of service, with the exception of the following roadway segments:

Table E: Existing Intersection Levels of Service

Figure 16: Existing Weekday AM Peak Hour Intersection Levels of Service

Figure 17: Existing Weekday PM Peak Hour Intersection Levels of Service

Figure 18: Existing Saturday AM Peak Hour Intersection Levels of Service

Figure 19: Existing Saturday Midday Peak Hour Intersection Levels of Service

Table F: Existing Weekday Roadway Segment Levels of Service

3. Hawthorne Boulevard: Between Silver Spur Road and Grayslake Road-Highridge Road and Indian Peak Road;
19. Crenshaw Boulevard: Between the Northern City limits and Indian Peak Road;
34. Western Avenue: Between the Northern City Limits and Delasonde Drive;
35. Western Avenue: Between Delasonde Drive and Trudie Drive; and
36. Western Avenue: Between Trudie Drive and the Southern City limits.

Figure 20 illustrates the locations of the study area roadway segments and existing weekday levels of service.

7.0 GENERAL PLAN BUILD OUT CONDITIONS

This section discusses General Plan Build Out transportation conditions in the study area.

7.1 General Plan Build Out Roadway Conditions

General Plan Build Out roadway conditions are assumed to be the same as those under existing conditions with the exception of the intersection of Western Avenue/Avenida Aprenda, which includes an additional northbound through movement and an east leg due to the Ponte Vista at San Pedro Specific Plan development. Figure 21 illustrates the General Plan Build Out intersection geometrics and stop control at the study area intersections.

7.2 General Plan Build Out Transit Service

The expansion of transit services through the City and Palos Verdes Peninsula is a goal of the City as the region's population increases. Future regional transit options are discussed below.

The South Bay Metro Green Line Extension is a project planned to examine extending rail service to the South Bay. The project will improve mobility in the southwestern Los Angeles County by accessing the regional rail network through connections to the Metro Blue Line and the proposed Crenshaw/LAX Transit Corridor. Measure R will provide $272 million for the rail extension to Redondo Beach with a possible connection to Torrance through Los Angeles Metro.

The Airport Metro Connector 96th Street Transit Station is a project by Metro that will connect the regional transit system to Los Angeles International Airport's Central Terminal Area with an Automated People Mover. The station will be served by the Metro Green and Crenshaw/LAX Lines and will feature a bus plaza for buses, passenger pick-up/drop-off, and amenities for pedestrians and bicyclists.

The Metro Crenshaw/LAX Line is an extension of the Metro Exposition Line at Crenshaw and Exposition Boulevards and will travel to the Metro Green Line and serve the cities of Los Angeles, Inglewood, El Segundo, and Los Angeles County with eight stations.





Figure 20: Existing Weekday Roadway Segment Levels of Service

Figure 21: General Plan Build Out Intersection Geometrics and Stop Control

7.3 General Plan Build Out Bicycle Facilities

Figure 11 illustrates the planned bicycle facilities within the City and Peninsula. As shown in Figure 11, planned bicycle facilities within the City include segments on Crenshaw Boulevard from Indian Peak Road to Burrell Lane, Hawthorne Boulevard from Indian Peak Road to the northern City limits, Silver Spur Road from Montemalaga Road to Hawthorne Boulevard, Miraleste Drive from Palos Verdes Drive East to 1st Street, Western Avenue from Caddington Drive to the northern City limits, and Yacht Harbor Drive.

7.4 General Plan Build Out Trail Facilities

The City's Trails Network Plan is being updated to include modifications to the five geographical sections within the City. Modifications to the plan include conceptual trails, proposed trails, and removal of trails throughout the City. Figure 12 illustrate the modifications to the trail facilities in the City.

7.5 General Plan Build Out Weekday Intersection Levels of Service

An intersection level of service analysis was conducted for General Plan Build Out weekday conditions to determine the projected circulation system performance. The General Plan Build Out weekday levels of service for the study area intersections are summarized in Table G. Level of service calculation worksheets are contained in Appendix D. As shown in Table G, all study area intersections are projected to operate at satisfactory levels of service, with the exception of the following intersections:

3. Via Rivera/Hawthorne Boulevard - a.m. and p.m. peak hours;
10. Grayslake Road-Highridge Road/Hawthorne Boulevard - a.m. peak hour;
16. Crenshaw Boulevard/Crest Road - a.m. peak hour;
18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South - a.m. and p.m. peak hours;
19. Palos Verdes Drive East/Palos Verdes Drive South - a.m. and p.m. peak hours;
21. Palos Verdes Drive East/Via Canada - a.m. peak hour;
23. Palos Verdes Drive East/Miraleste Drive - a.m. and p.m. peak hours;
25. Western Avenue/Aveue Aprenda - a.m. peak hour; and
30. Seahill Drive-Tramonto Drive/Palos Verdes Drive South - a.m. and p.m. peak hours.

Figures 22 and 23 illustrate the locations of the study area intersections and corresponding a.m. and p.m. peak hour levels of service under General Plan Build Out weekday conditions.

Table G: General Plan Build Out Intersection Levels of Service

Figure 22: General Plan Build Out Weekday AM Peak Hour Intersection Levels of Service

Figure 23: General Plan Build Out Weekday PM Peak Hour Intersection Levels of Service

7.6 General Plan Build Out Saturday Intersection Levels of Service

An intersection level of service analysis was conducted for six study intersections under General Plan Build Out Saturday conditions to determine the projected circulation system performance. The General Plan Build Out Saturday levels of service for the study area intersections are summarized in Table G. Level of service calculation worksheets are contained in Appendix D. As shown in Table G, all study area intersections are projected to operate at satisfactory levels of service, with the exception of the following:

18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South - midday peak hour; and
19. Palos Verdes Drive East/Palos Verdes Drive South - midday peak hour.

Figures 24 and 25 illustrate the locations of the study area intersections and corresponding a.m. and p.m. peak hour levels of service under General Plan Build Out Saturday conditions.

7.7 General Plan Build Out Weekday Roadway Segment Levels of Service

A level of service analysis was conducted at study area roadway segments for General Plan Build Out weekday conditions to determine the projected circulation system performance. The General Plan Build Out weekday levels of service for the study area roadway segments are summarized in Table H. Level of service calculation worksheets are contained in Appendix D. As shown in Table H, all study area roadway segments are projected to operate at satisfactory levels of service, with the exception of the following roadway segments:

3. Hawthorne Boulevard: Between Silver Spur Road and Grayslake Road-Highridge Road and Indian Peak Road;
13. Palos Verdes Drive South: Between Narcissa Drive and Palos Verdes Drive East;
19. Crenshaw Boulevard: Between the Northern City limits and Indian Peak Road;
34. Western Avenue: Between the Northern City Limits and Delasonde Drive;
35. Western Avenue: Between Delasonde Drive and Trudie Drive; and
36. Western Avenue: Between Trudie Drive and the Southern City limits.

Figure 26 illustrates the locations of the study area roadway segments and General Plan Build Out weekday levels of service.

8.0 CIRCULATION IMPROVEMENTS

The General Plan strives to maintain a level of service of LOS D at intersections and roadway segments within the City. To support the proposed Land Use Element, the following improvements are recommended to restore all intersections and roadway segments to satisfactory conditions.

8.1 General Plan Build Out Weekday Intersection Improvements

Under General Plan Build Out weekday conditions, nine intersections will not meet the City's minimum level of service standard. The following improvements are recommended to restore all intersections to satisfactory conditions:

Figure 24: General Plan Build Out Saturday AM Peak Hour Intersection Levels of Service

Figure 25: General Plan Build Out Saturday Midday Peak Hour Intersection Levels of Service

Table H: General Plan Build Out Weekday Roadway Segment Levels of Service

Figure 26: General Plan Build Out Weekday Roadway Segment Levels of Service

3. Via Rivera/Hawthorne Boulevard: Install a traffic signal. An intersection signal warrant analysis was conducted at this location for the a.m. and p.m. peak hours. This analysis is based on the *2012 California Manual of Uniform Traffic Control Devices* (Warrant 3 - Peak Hour). The analysis is included in Appendix F, and shows that a signal is warranted during the a.m. and p.m. peak hours.

10. Grayslake Road-Highridge Road/Hawthorne Boulevard: Add an eastbound right-turn lane.

16. Crenshaw Boulevard/Crest Road: Install a traffic signal. An intersection signal warrant analysis was conducted at this location for the a.m. and p.m. peak hours. This analysis is based on the *2012 California Manual of Uniform Traffic Control Devices* (Warrant 3 - Peak Hour). The analysis is included in Appendix F, and shows that a signal is warranted during the a.m. and p.m. peak hours.

18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South: Add a two-way left-turn lane on Palos Verdes Drive South. A two-way left-turn lane provides a deceleration and storage area for vehicles traveling in either direction that are making left-turns at an intersection.

19. Palos Verdes Drive East/Palos Verdes Drive South: Add a two-way left-turn lane on Palos Verdes Drive South. A two-way left-turn lane provides a deceleration and storage area for vehicles traveling in either direction that are making left-turns at an intersection.

21. Palos Verdes Drive East/Via Canada: Install a traffic signal. An intersection signal warrant analysis was conducted at this location for the a.m. and p.m. peak hours. This analysis is based on the *2012 California Manual of Uniform Traffic Control Devices* (Warrant 3 - Peak Hour). The analysis is included in Appendix F, and shows that a signal is warranted during the a.m. and p.m. peak hours.

23. Palos Verdes Drive East/Miraleste Drive: Add a two-way left-turn lane on Palos Verdes Drive East. A two-way left-turn lane provides a deceleration and storage area for vehicles traveling in either direction that are making left-turns at an intersection.

25. Western Avenue/Avenida Aprenda: Add an eastbound left-turn lane.

30. Seahill Drive-Tramonto Drive/Palos Verdes Drive South: Add a two-way left-turn lane on Palos Verdes Drive South. An intersection traffic signal warrant analysis was conducted at this location for the a.m. and p.m. peak hours to determine if a traffic signal was a viable mitigation measure. This analysis is based on the *2012 California Manual of Uniform Traffic Control Devices* (Warrant 3 - Peak Hour). The analysis is included in Appendix F, and shows that the a.m. peak hour is just below the minimum volume threshold on the minor street. A traffic signal as the mitigation measure would operate at LOS C with a delay of 22.4 seconds in the a.m. peak hour and LOS C with a delay of 26.7 seconds in the p.m. peak hour.

Table I summarizes the General Plan Build Out weekday conditions with the recommended intersection improvements. Level of service worksheets are included in Appendix D. Figures 27 illustrate the resulting intersection geometrics and stop control. Figures 28 and 29 illustrate the locations of the study area intersections and corresponding a.m. and p.m. peak hour levels of

service under General Plan Build Out weekday conditions with the recommended intersection improvements.

Table I: General Plan Build Out With Improvements Intersection Levels of Service

Figure 27: General Plan Build Out With Improvements Intersection Geometrics and Stop Control

Figure 28: General Plan Build Out With Improvements Weekday AM Peak Hour Intersection Levels of Service

Figure 29: General Plan Build Out With Improvements Weekday PM Peak Hour Intersection Levels of Service

8.2 General Plan Build Out Saturday Intersection Improvements

Under General Plan Build Out weekday conditions, nine intersections will not meet the City's minimum level of service standard. The following improvements are recommended to restore all intersections to satisfactory conditions:

18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South: Add a two-way left-turn lane on Palos Verdes Drive South. A two-way left-turn lane provides a deceleration and storage area for vehicles traveling in either direction that are making left-turns at an intersection.
19. Palos Verdes Drive East/Palos Verdes Drive South: Add a two-way left-turn lane on Palos Verdes Drive South. A two-way left-turn lane provides a deceleration and storage area for vehicles traveling in either direction that are making left-turns at an intersection.

Table I summarizes the General Plan Build Out Saturday conditions with the recommended intersection improvements. Level of service worksheets are included in Appendix D. Figures 27 illustrate the resulting intersection geometrics and stop control. Figures 30 and 31 illustrate the locations of the study area intersections and corresponding a.m. and p.m. peak hour levels of service under General Plan Build Out Saturday conditions with the recommended intersection improvements.

8.3 General Plan Build Out Roadway Segment Improvements

Under General Plan Build Out weekday conditions, six roadway segments will not meet the City's minimum level of service standard. The following improvements are recommended to restore all roadway segments to satisfactory conditions:

3. Hawthorne Boulevard: Between Silver Spur Road and Grayslake Road-Highridge Road and Indian Peak Road: Convert roadway segment from 4-lane Divided Arterial to 5-lane Divided Arterial.
13. Palos Verdes Drive South: Between Narcissa Drive and Palos Verdes Drive East: The improvement necessary to maintain satisfactory Levels of Service at this roadway segment is to convert it to a 4-Lane Divided Arterial. However, this improvement would require elimination of bicycle lanes and may not be feasible.
19. Crenshaw Boulevard: Between the Northern City limits and Indian Peak Road: Convert roadway segment from 4-lane Divided Arterial to 5-lane Divided Arterial.
34. Western Avenue: Between the Northern City Limits and Delasonde Drive: Convert roadway segment from 4-lane Divided Arterial to 5-lane Divided Arterial.
35. Western Avenue: Between Delasonde Drive and Trudie Drive: Convert roadway segment from 4-lane Divided Arterial to 5-lane Divided Arterial.
36. Western Avenue: Between Trudie Drive and the Southern City limits: Convert roadway segment from 5-lane Divided Arterial to 6-lane Divided Arterial.

Figure 30: General Plan Build Out With Improvements Saturday AM Peak Hour Intersection Levels of Service

Figure 31: General Plan Build Out With Improvements Saturday Midday Peak Hour Intersection Levels of Service

Table J summarizes the General Plan Build Out weekday conditions with the recommended roadway segment improvements. Level of service worksheets are included in Appendix D.

The circulation improvements recommended above are to maintain LOS D or better. The Los Angeles County Congestion Management Program (CMP) designates the maximum acceptable level of service on arterial roads (i.e., major, secondary, and limited secondary highways) as LOS E, except where base year LOS is worse than LOS E, in which case, the base year LOS is the standard. Based on the current analysis, the segments forecast to operate at unsatisfactory LOS under future conditions on Hawthorne Boulevard and Western Avenue currently operate at LOS F. All other segments operate at LOS E or better under future conditions. From a CMP compliance perspective, all roadway segments are forecast to operate at or better than the minimum thresholds set by the CMP. Therefore, it is entirely up to the City if the above improvements are constructed or not.

It should also be noted that under General Plan Law, "Level of service standard" is a threshold that defines a deficiency on the congestion management program highway and roadway system which requires the preparation of a deficiency plan. It is the intent of the Legislature that the agency shall use all elements of the program to implement strategies and actions that avoid the creation of deficiencies and to improve multimodal mobility. "Multimodal" means the utilization of all available modes of travel that enhance the movement of people and goods, including, but not limited to, highway, transit, nonmotorized, and demand management strategies including, telecommuting. The availability and practicality of specific multimodal systems, projects, and strategies may vary by county and region in accordance with the size and complexity of different urbanized areas. Therefore, it is within the City's power to accept a lower automobile level of service for certain roadways to enhance other modes of travel.

8.4 General Plan Build Out Recommended Roadway Classifications

Figure 32 illustrates the recommended General Plan Build Out roadway classifications based on the proposed Land Use Element.

9.0 SUMMARY & CONCLUSIONS

Under existing weekday conditions, the following five study intersections and five roadway segments operate at unsatisfactory levels of service:

Intersections

3. Via Rivera/Hawthorne Boulevard - a.m. and p.m. peak hours;
18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South - a.m. and p.m. peak hours;
19. Palos Verdes Drive East/Palos Verdes Drive South - a.m. and p.m. peak hours;
21. Palos Verdes Drive East/Via Canada - a.m. peak hour; and
23. Palos Verdes Drive East/Miraleste Drive – a.m. and p.m. peak hours.

Table J: General Plan Build Out With Improvements Roadway Segment Levels of Service

Figure 32: General Plan Build Out Recommended Roadway Classifications

Roadway Segments

3. Hawthorne Boulevard: Between Silver Spur Road and Grayslake Road-Highridge Road and Indian Peak Road;
19. Crenshaw Boulevard: Between the Northern City limits and Indian Peak Road;
34. Western Avenue: Between the Northern City Limits and Delasonde Drive;
35. Western Avenue: Between Delasonde Drive and Trudie Drive; and
36. Western Avenue: Between Trudie Drive and the Southern City limits.

Under existing Saturday conditions, the following two study intersections operate at unsatisfactory levels of service:

18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South – midday peak hour; and
19. Palos Verdes Drive East/Palos Verdes Drive South – midday peak hour.

Under General Plan Build Out weekday conditions, the following nine intersections and six roadway segments are projected to operate at unsatisfactory levels of service:

Intersections

3. Via Rivera/Hawthorne Boulevard - a.m. and p.m. peak hours;
10. Grayslake Road-Highridge Road/Hawthorne Boulevard - a.m. peak hour;
16. Crenshaw Boulevard/Crest Road - a.m. peak hour;
18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South - a.m. and p.m. peak hours;
19. Palos Verdes Drive East/Palos Verdes Drive South - a.m. and p.m. peak hours;
21. Palos Verdes Drive East/Via Canada - a.m. peak hour;
23. Palos Verdes Drive East/Miraleste Drive – a.m. and p.m. peak hours;
25. Western Avenue/Avenida Aprenda – a.m. peak hour; and
30. Seahill Drive-Tramonto Drive/Palos Verdes Drive South – a.m. and p.m. peak hours.

Roadway Segments

3. Hawthorne Boulevard: Between Silver Spur Road and Grayslake Road-Highridge Road and Indian Peak Road;
13. Palos Verdes Drive South: Between Narcissa Drive and Palos Verdes Drive East;
19. Crenshaw Boulevard: Between the Northern City limits and Indian Peak Road;
34. Western Avenue: Between the Northern City Limits and Delasonde Drive;
35. Western Avenue: Between Delasonde Drive and Trudie Drive; and
36. Western Avenue: Between Trudie Drive and the Southern City limits.

Under General Plan Build Out Saturday conditions, the following two intersections are projected to operate at unsatisfactory levels of service:

18. Forrestal Drive-Trump National Drive/Palos Verdes Drive South – midday peak hour; and
19. Palos Verdes Drive East/Palos Verdes Drive South – midday peak hour.

With the implementation of the recommended circulation improvements, all intersections and roadway segments will maintain the City's threshold of LOS D.

APPENDIX A:
LAND USE CHARACTERISTICS

APPENDIX B:
TRAFFIC COUNTS

APPENDIX C:
VOLUME DEVELOPMENT WORKSHEETS

APPENDIX D:
LEVEL OF SERVICE WORKSHEETS

APPENDIX E:
VEHICLE AND PEDESTRIAN COLLISION DATA

APPENDIX F:
PEAK HOUR SIGNAL WARRANTS