4.8 TRAFFIC AND CIRCULATION

The following analysis is partially based on the Traffic Impact Analysis for the Crestridge Project, prepared by Linscott, Law and Greenspan, (LLG) Engineers and dated June 26, 2012. The full study is contained in Appendix G of the EIR.

4.8.1 Setting

a. Existing Street System. The principal local network of streets serving the project site includes Crenshaw Boulevard, Hawthorne Boulevard, Crestridge Road, Crest Road, Highridge Road and Indian Peak Road. The following provides a brief synopsis of these key area streets.

- **Crenshaw Boulevard** is a four-lane, divided roadway oriented in the north-south direction. On-street parking is not permitted along this roadway in the vicinity of the project site. The posted speed limit on Crenshaw Boulevard is 45 miles per hour (mph). Traffic signals control the intersections of Crenshaw Boulevard at Indian Peak Road and Crenshaw Boulevard at Crestridge Road. This roadway is designated as an Arterial (four-lane divided) in the City of Rancho Palos Verdes General Plan Circulation Element and has an existing paved width of 50 feet within a right-of-way of 80 feet. Daily traffic on Crenshaw Boulevard ranges between 14,957 vehicles per day (vpd) and 30,175 vpd on a "typical" weekday.

- **Hawthorne Boulevard** is a four-lane, divided roadway generally oriented in the north-south direction. On-street parking is not permitted along the majority of this roadway in the vicinity of the project. The posted speed limit on Hawthorne Boulevard is 45 mph between Crest Road and Highridge Road, 40 mph between Highridge Road and Indian Peak Road, 35 mph between Indian Peak Road and Silver Spur Road and 45 mph between Silver Spur Road and Palos Verdes Drive. A traffic signal controls the intersection of Hawthorne Boulevard at Highridge Road. This roadway is designated as an Arterial (four-lane divided) in the City of Rancho Palos Verdes General Plan Circulation Element and has an existing paved width of 80 feet within a right-of-way of 100 feet.

- **Crestridge Road** is a two lane, divided roadway oriented in the east-west direction, which borders the project site to the south. A fourteen-foot wide, two-way left-turn lane is provided along Crestridge Road. Crestridge Road would provide access to the project site via a full access unsignalized driveway. On-street parking is permitted along this roadway in the vicinity of the project site. The posted speed limit on Crestridge Road is 40 mph. A traffic signal controls the intersection of Crestridge Road and Crenshaw Boulevard. This roadway is designated as Local (two-lane divided) in the City of Rancho Palos Verdes General Plan Circulation Element and has an existing paved width of 64 feet within a right-of-way of 80 feet. Daily traffic on Crestridge Road totals 7,510 vpd on a "typical" weekday.

- **Crest Road** is a four-lane, divided roadway oriented in the east-west direction. On-street parking is not permitted along this roadway in the vicinity of the project. The posted speed limit on Crest Road is 45 mph. The intersection of Crest Road and Crenshaw Boulevard is controlled by an all-way stop. This roadway is designated as an Arterial

(four-lane divided) in the City of Rancho Palos Verdes General Plan Circulation Element and has an existing paved width of 72 feet within a right-of-way of 100 feet.

- **Highridge Road** is a two-lane, divided roadway oriented in the north-south direction. On-street parking is not permitted along this roadway in the vicinity of the project. The posted speed limit on Highridge Road is 35 mph. The intersection of Highridge Road and Crestridge Road is controlled by an all-way stop. This roadway is designated as an Arterial (four-lane divided) in the City of Rancho Palos Verdes General Plan Circulation Element and has an existing paved width of 80 feet within a right-of-way of 100 feet. Daily traffic on Highridge Road totals 8,219 vpd on a "typical" weekday.

- **Indian Peak Road** is a two-lane, divided roadway oriented in the east-west direction. On-street parking is not permitted along this roadway in the vicinity of the project. The posted speed limit on Indian Peak Road is 40 mph. A traffic signal controls the intersection of Indian Peak Road and Crenshaw Boulevard. This roadway is designated as a Collector (four-lane divided) in the City of Rancho Palos Verdes General Plan Circulation Element and has an existing paved width of 40 feet within a right-of-way of 80 feet. Daily traffic on Indian Peak Road totals 6,633 vpd on a "typical" weekday.

b. Existing Traffic Volumes and Level of Service. Consistent with City of Rancho Palos Verdes guidelines for traffic impact analyses and LA County Congestion Management Program (CMP) requirements, existing traffic conditions in the vicinity of the project area were analyzed using the Intersection Capacity Utilization (ICU) Methodology.

The efficiency of traffic operations at a location is measured in terms of Level of Service (LOS). Level of service is a description of traffic performance at intersections. The level of service concept is a measure of average operating conditions at intersections during an hour. It is based on volume-to-capacity (V/C) ratio. Levels range from A to F with A representing excellent (free-flow) conditions and F representing extreme congestion. The ICU methodology compares the level of traffic during the peak hours at an intersection (volume) to the amount of traffic that the intersection is able to carry (capacity). Intersections with vehicular volumes that are at or near capacity ($V/C \approx 1.0$) experience greater congestion and longer vehicle delays.

Analysis of unsignalized intersections is conducted differently from signalized intersections due to different operating characteristics. Stop-controlled intersections are analyzed using the delay-based Highway Capacity Manual (HCM) method of determining level of service, which measures average vehicle delay to affected vehicles.

Table 4.8-1 describes the six qualitative categories of LOS along with the corresponding ICU value range for signalized intersections. Table 4.8-2 describes the LOS concept and operating conditions for stop-controlled intersections.

Table 4.8-1
Level of Service Definitions for Signalized Intersections
(ICU Methodology)

Level of Service (LOS)	Interpretation	Volume to Capacity Ratio
A	Excellent operation - free-flow	≤ 0.600
B	Very good operation - stable flow, little or no delays	0.601 - 0.700
C	Good operation - slight delays	0.701 - 0.800
D	Fair operation – noticeable delays, queuing observed	0.801 - 0.900
E	Poor operation - long delays, near or at capacity	0.901 - 1.000
F	Forced flow – congestion	> 1.000

Source: Transportation Research Board Circular 212 – Interim Materials on Highway Capacity

Table 4.8-2
Level of Service Criteria for Unsignalized Intersections
(HCM Methodology)

LOS	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	< 10	Little or no delay
B	> 10 and < 15	Short traffic delays
C	> 15 and < 25	Average traffic delays
D	> 25 and < 35	Long traffic delays
E	> 35 and < 50	Very long traffic delays
F	> 50	Severe congestion

Source: Highway Capacity Manual 2000, Chapter 17 (Unsignalized Intersections).

Five key study intersections have been selected for evaluation of existing and future traffic operating conditions based on their potential to be affected by project-generated traffic. These intersections include the following:

1. Crenshaw Boulevard at Indian Peak Road
2. Crenshaw Boulevard at Crestridge Road
3. Crenshaw Boulevard at Crest Road
4. Highridge Road at Hawthorne Boulevard
5. Highridge Road at Crestridge Road

Some portion of potential project-related traffic will pass through each of these intersections, and their analysis will reveal the expected relative impacts of the project. These key intersections were selected for evaluation based on discussions with the City of Rancho Palos Verdes and in consideration of the criteria in the current County of Los Angeles CMP traffic impact guidelines.

Existing daily, AM and PM peak hour traffic volumes for the five key study intersections and roadway segments evaluated in this report were obtained from daily machine and manual peak hour turning movement counts conducted by Transportation Studies Inc. in May 2012.

Table 4.8-3 summarizes the existing peak hour service level calculations for the five key study intersections based on existing traffic volumes and current street geometry. Existing traffic volumes at the study intersections during the weekday AM and PM peak hours are shown in Figures 4.8-1 and 4.8-2, respectively. Figure 4.8-2 also shows the existing average daily traffic volumes for the key roadway segments in the vicinity of the project site.

Table 4.8-3
Existing Intersection Levels of Service Summary

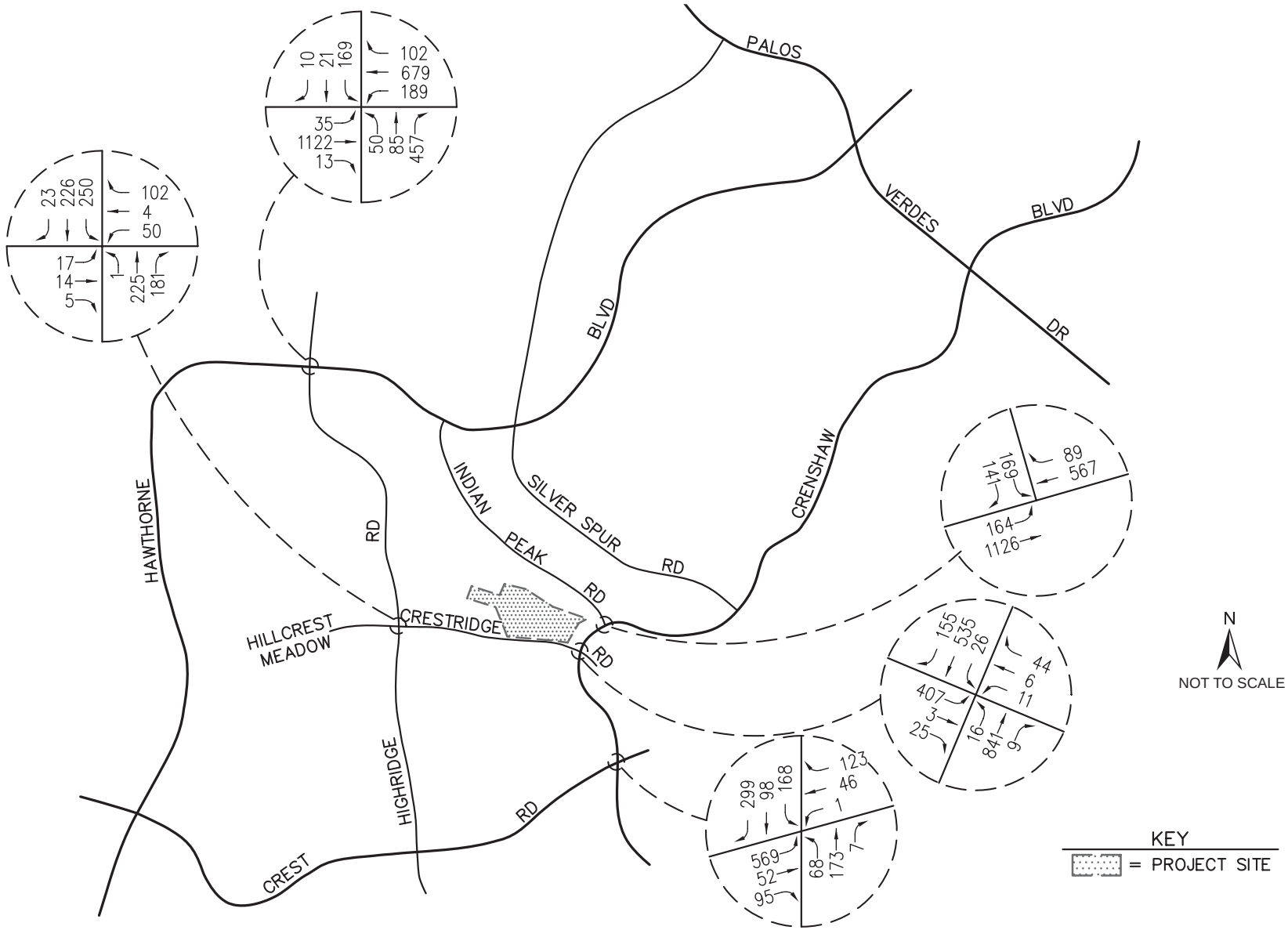
Key Intersection	Time Period	Control Type	ICU/HCM	LOS
Crenshaw Blvd at Indian Peak Rd	AM PM	3Ø Traffic Signal	0.558 0.509	A A
Crenshaw Blvd at Crestridge Rd	AM PM	6Ø Traffic Signal	0.545 0.412	A A
Crenshaw Blvd at Crest Rd	AM PM	All – Way Stop	19.4 sec/veh 11.9 sec/veh	C B
Highridge Rd at Hawthorne Blvd	AM PM	5Ø Traffic Signal	0.847 0.702	D C
Highridge Rd at Crestridge Rd	AM PM	All – Way Stop	13.5 sec/veh 10.4 sec/veh	B B

Source: Linscott, Law and Greenspan, June 2012

According to the City of Rancho Palos Verdes, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours. As shown in Table 4.8-3, all five key study intersections currently operate at acceptable LOS D or better during the AM and PM peak hours.

4.8.2 Impact Analysis

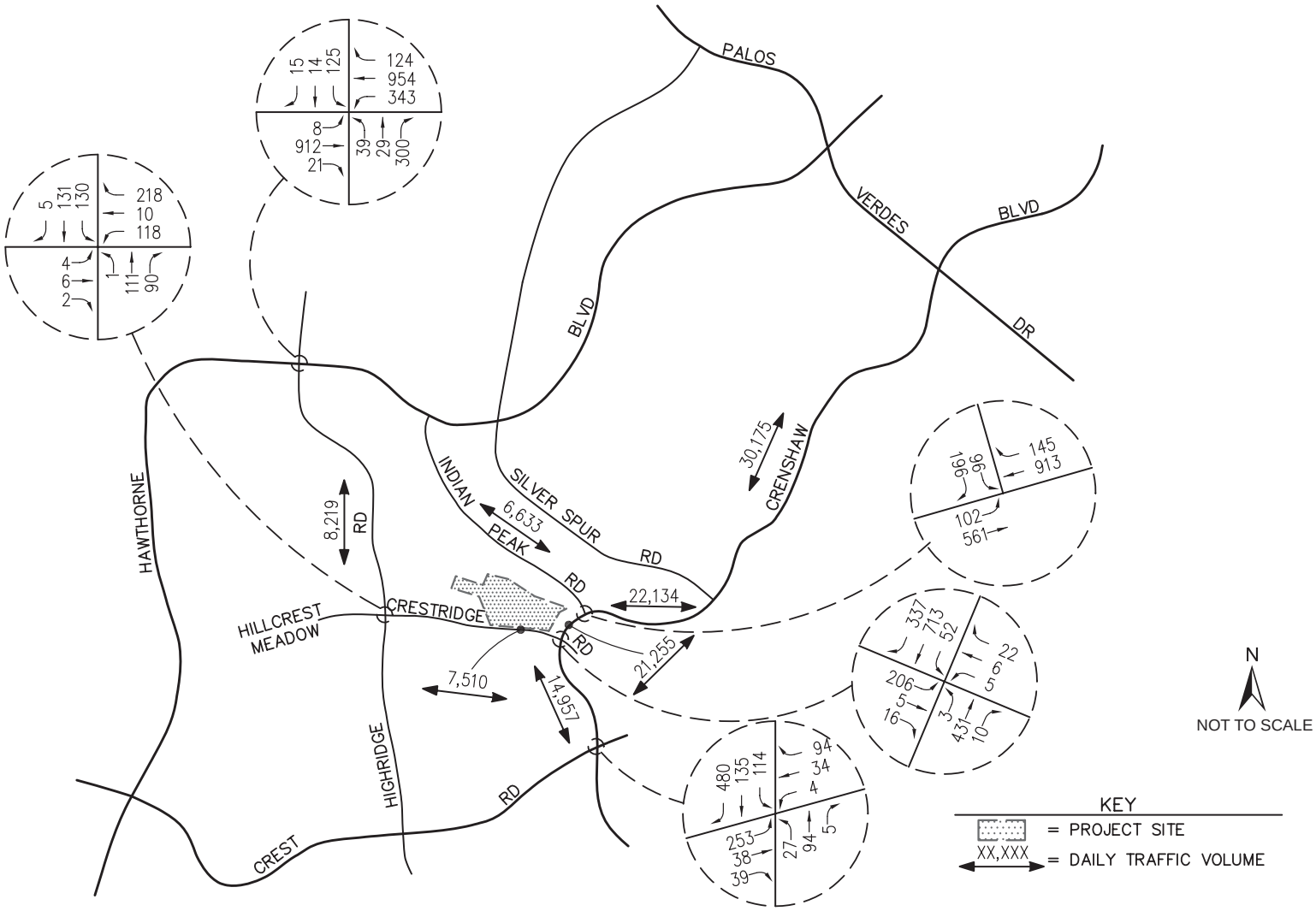
a. Methodology and Significance Thresholds. The traffic impact characteristics of the proposed project are estimated in this analysis through a multi-step process. The first step is trip generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.



Existing A.M. Peak Hour Traffic Volumes

Figure 4.8-1

Source: Lanscott Law & Greenspan, June 21, 2012.



Existing P.M. Peak Hour and Daily Traffic Volumes

Figure 4.8-2

Source: Lanscott Law & Greenspan, June 21, 2012.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

Project Traffic Generation. Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are typically found in the 8th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE) [Washington, D.C., 2008]. For this analysis, three different trip generation rates were considered in forecasting the trip generation potential of the proposed project. These include: Condominium/Townhomes rates from the *Los Angeles County Traffic Impact Analysis Guidelines* (January 1, 1997); ITE Land Use 230: Residential Condominium/Townhouse rates; and ITE Land Use 252: Senior Housing – Attached rates. The City of Rancho Palos Verdes ultimately decided to estimate the traffic generation potential of the proposed project using the Los Angeles County Condominium/ Townhomes rates, rather than use the ITE rates, in order to provide the most conservative analysis, even though the condominiums would be an age-restricted (55 plus) senior condominium development. (Please note that the proposed community recreation area and the community service center would not generate any new traffic; these facilities are ancillary uses to the proposed project and would primarily be used by its residents.)

Table 4.8-4 presents the proposed project's forecast peak hour and daily traffic volumes based on the Los Angeles County Condominium/Townhomes rates. Review of the table indicates that the proposed project is forecast to generate approximately 480 daily trips, with 33 trips (4 inbound, 29 outbound) produced in the AM peak hour and 44 trips (28 inbound, 16 outbound) produced in the PM peak hour on a "typical" weekday.

Project Traffic Distribution and Assignment. Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- Site's proximity to major traffic carriers (i.e. Crenshaw Blvd, Hawthorne Blvd, etc.)
- Expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals
- Existing intersection traffic volumes
- Ingress/egress availability at the site
- Input from City of Rancho Palos Verdes staff

Table 4.8-4
Project Traffic Generation Forecast

Land Use	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Generation Factor Condominium/Townhomes (TE/DU)[1]	8.00	0.06	0.48	0.54	0.47	0.26	0.73
Generation Forecast Crestridge Project (60 DU)	480	4	29	33	28	16	44
Total Trip Generation Potential	**480**	**4**	**29**	**33**	**28**	**16**	**44**

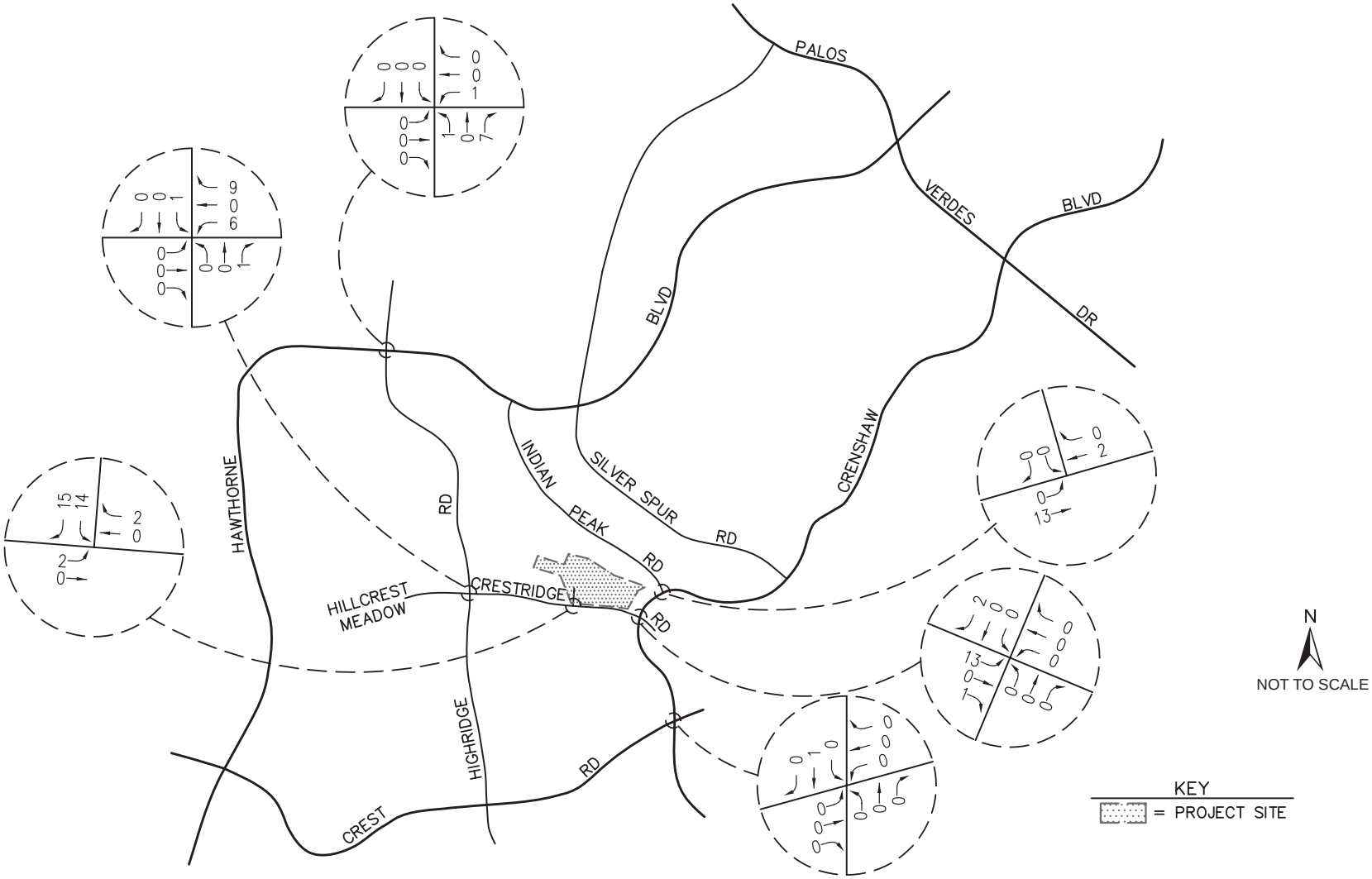
TE/DU = Trip ends per dwelling units of development
[1] *Generation Factor from* Los Angeles County Traffic Impact Analysis Report Guidelines, *dated January 1, 1997*
Source: Linscott, Law and Greenspan, June 2012

The anticipated AM and PM peak hour project volumes associated with the proposed project are presented in Figures 4.8-3 and 4.8-4, respectively. Figure 4.8-4 also presents the average daily traffic volumes for the key roadway segments forecast to be generated by the proposed project.

Intersection Methodology. As discussed above in *Setting*, existing AM and PM peak hour operating conditions for the five key study intersections were evaluated using the Intersection Capacity Utilization (ICU) methodology for signalized intersections and the methodology outlined in Chapter 17 of the *Highway Capacity Manual 2000* (HCM2000) for unsignalized intersections.

As part of the traffic study prepared for the project, existing daily, AM and PM peak hour traffic volumes for the five key study intersections and roadway segments were obtained from daily machine and manual peak hour turning movement counts in May 2012. The manual counts were conducted by traffic count subconsultants at the study intersections from 7:00 to 9:00 AM to determine the weekday AM peak commuter hour, and from 4:00 to 6:00 PM to determine the weekday PM peak commuter hour.

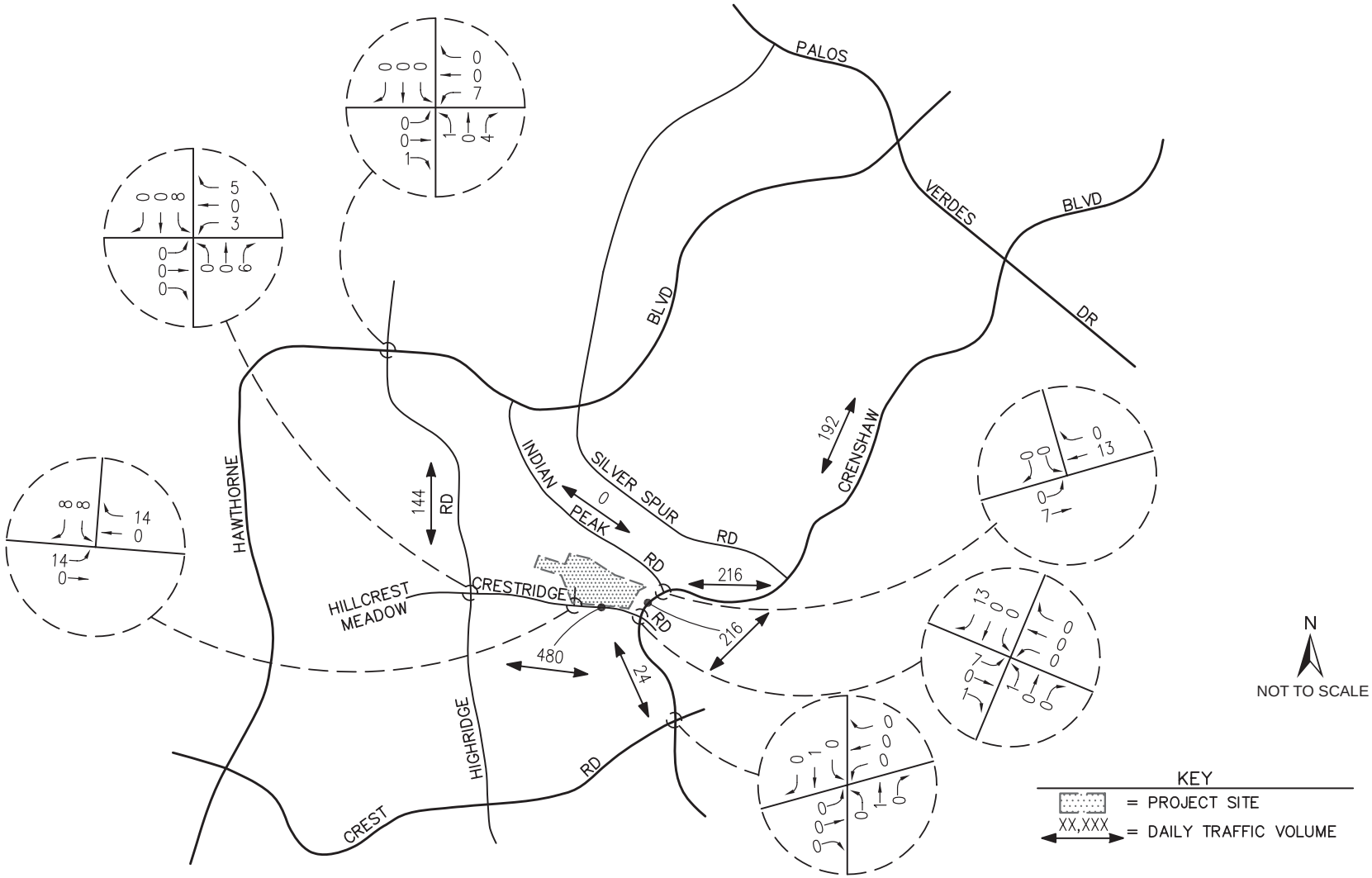
Intersection Capacity Utilization Method of Analysis. The City of Rancho Palos Verdes and the Los Angeles County Congestion Management Program (CMP) require existing weekday AM and PM peak hours operating conditions for signalized study intersections be evaluated using the Intersection Capacity Utilization (ICU) method. The ICU methodology is intended for signalized intersection analyses and estimates the volume-to-capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU analysis methodology describes the operation of a signalized intersection using a range of LOS from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on corresponding V/C ratios.



A.M. Peak Hour Project Traffic Volumes

Figure 4.8-3

Source: Lanscott Law & Greenspan, June 21, 2012.



P.M. Peak Hour and Daily Project Traffic Volumes

Figure 4.8-4

Source: Lanscott Law & Greenspan, June 21, 2012.

The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. The ICU value translates to a LOS estimate, which is a relative measure of an intersection's performance. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in Table 4.8-5. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements.

Table 4.8-5
Level of Service Criteria for Signalized Intersections

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.600	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.601 – 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901 – 1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

Pursuant to Los Angeles County CMP requirements, the ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn, through, and right-turn lanes, and a dual left-turn capacity of 2,880 vph. Additionally, a clearance adjustment factor of 0.10 was added to each LOS calculation to account for time devoted to the yellow and all-red intervals.

Highway Capacity Manual Method of Analysis (Unsignalized Intersections). The 2000 HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. For all-way stop controlled intersections, the overall average control delay measured in seconds per vehicle, and level of service is then calculated for the entire intersection. For one-way and two-way stop-controlled (minor street stop-controlled) intersections, this methodology estimates the worst side street delay, measured in seconds per vehicle and determines the level of service for that approach. The HCM control delay value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in Table 4.8-6.

Table 4.8-6
Level of Service Criteria for Unsignalized Intersections (HCM)

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

Significance of Impacts on Intersection Operation. The significance of the potential project-generated traffic impacts during the AM and PM peak hours was evaluated based on analysis of future operating conditions at the five key study intersections without, then with, the proposed project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection. The significance of the potential impacts of the proposed project at each key intersection was then evaluated using the City's LOS standards and significant transportation impact criteria. A significant transportation impact is determined based on the sliding scale criteria presented in Table 4.8-7.

Table 4.8-7
Signalized Intersection Impact Threshold Criteria

Pre-Project ICU	Level of Service	Project Related Increase in ICU
≥ 0.71 - 0.80	C	equal to or greater than 0.04
≥ 0.81 - 0.90	D	equal to or greater than 0.02
≥ 0.91 or more	E/F	equal to or greater than 0.01

Source: Traffic Impact Analysis Report Guidelines, Los Angeles County Department of Public Works, 1997

As indicated in Table 4.8-7, the project-related increase in ICU value for the signalized intersections that defines a significant impact varies with LOS. At LOS C or LOS D, the threshold of significance is an increase of 0.04 or greater or 0.02 or greater, respectively, in the ICU value for signalized intersections. This is reduced to 0.01 or greater under LOS E and F. Similarly, for the unsignalized intersections, a decrease in LOS by one level or more is considered significant for those locations operating at LOS D or E.

Future Traffic Volume and Distribution. Horizon year background traffic growth estimates were calculated using an ambient growth factor. The ambient traffic growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the

study area. The future growth in traffic volumes has been calculated at one percent (1%) per year. Application of the ambient growth factor to existing Year 2012 traffic volumes results in a three percent (3.0%) increase growth in existing volumes to the horizon Year 2015.

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed project, the status of other known development projects (cumulative projects) within a three-mile radius of the site has been researched at the City of Rancho Palos Verdes, the City of Rolling Hills Estates and the City of Los Angeles. With this information, the potential impact of the proposed project can be evaluated within the context of the cumulative impact of all ongoing development.

There are 15 cumulative projects in the City of Rancho Palos Verdes, nine cumulative projects in the City of Rolling Hills Estates and one cumulative project in the City of Los Angeles that have either been built, but not yet fully occupied, or are being processed for approval. These 25 cumulative projects have been included as part of the cumulative background setting.

Traffic volumes expected to be generated by the related projects were calculated either using the respective studies, which are on file with the City or was derived from the 8th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2008]. The related projects' respective traffic generation for the weekday AM and PM peak hours, as well as on a daily basis for a typical weekday, is summarized in Table 4.8-8.

Table 4.8-8
Cumulative Projects Traffic Generation Forecast

Cumulative Projects Description	Daily 2-way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Rancho Palos Verdes Development							
1. Trump National Golf Club	555	11	33	44	38	21	59
2. Ocean Front Estates	48	1	3	4	3	2	5
3. Tentative Tract Map No. 52666	10	0	1	1	1	0	1
4. Marymount College Facilities Expansion	1,931	149	51	200	83	92	175
5. Hawthorne/Crest Office Building	80	10	1	11	2	9	11
6. Peninsula Community Church	25	2	0	2	1	2	3
7. Green Hills Master Plan Revision	129	4	1	5	8	15	23
8. Highridge Condominium Project	216	2	13	15	13	7	20
9. St. John Fisher Church Expansion	380	24	20	44	22	23	45
10. Point Vicente Animal Hospital	280	18	7	25	11	17	28
11. Zone 2 Landslide Moratorium Ordinance Revision	450	9	26	35	30	17	47
12. Chevron Gas Station and Car Wash	917	37	35	72	43	41	84
13. Grandview Park Master Plan	199	49	44	93	44	49	93
14. Lower Hesse Park Master Plan	129	7	6	13	8	8	16
15. Point View Master Plan	313	0	0	0	100	4	104

Table 4.8-8
Cumulative Projects Traffic Generation Forecast

Cumulative Projects Description	Daily 2-way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Rolling Hills Estates Development							
16. Rolling Hills Covenant Church	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal	Nominal
17. Butcher Subdivision	124	2	7	9	8	5	13
18. Chandler Ranch	1,486	24	42	66	152	70	222
19. Deep Valley Condos	636	-2	15	13	30	21	51
20. 827 Deep Valley Drive Condos	128	1	8	9	8	4	12
21. Mediterranean Village	689	6	37	43	37	23	60
22. Brickwalk LLC Condominiums	1,813	18	77	95	87	59	146
23. Chase Bank Project	652	30	24	54	57	57	114
24. Tanglewood Subdivision	20	1	1	2	1	1	2
Los Angeles Development							
25. Ponte Vista Project	7,270	90	386	476	380	190	570
Total Cumulative Projects Trip Generation Potential	**18,480**	**493**	**838**	**1,331**	**1,167**	**737**	**1,904**

Source: Linscott, Law and Greenspan, June 2012

Congestion Management Program Analysis. The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Los Angeles County Metropolitan Transportation Authority (LACMTA). The purpose of the CMP is to develop a coordinated approach to managing and decreasing traffic congestion by linking the various transportation, land use and air quality planning programs throughout the County. The CMP for Los Angeles County requires that the traffic impact of individual development projects of potential regional significance be analyzed. A specific system of arterial roadways plus all freeways comprise the CMP system.

As required by the current CMP for Los Angeles County, a review has been made of designated monitoring locations on the CMP highway system for potential impact analysis. Per CMP TIA criteria, the geographic area examined in the TIA must include the following, at a minimum:

- All CMP arterial monitoring intersections, including freeway on and off-ramp intersections, where the project will add 50 or more trips during either the AM or PM weekday peak hours

- Mainline freeway-monitoring stations where the project will add 150 or more trips, in either direction, during the AM or PM weekday peak hours

The following CMP intersection monitoring locations have been identified in the vicinity of the proposed project:

CMP Station	*Location*
58	Pacific Coast Highway at Western Avenue
84	Western Avenue at 9th Street
128	Western Avenue at Toscanini Drive
151	Pacific Coast Highway at Crenshaw Boulevard
152	Pacific Coast Highway at Hawthorne Boulevard
153	Pacific Coast Highway at Palos Verdes Boulevard

In addition, as required by the current CMP for Los Angeles County, a review has been made of the potential impacts of the project on transit service. The Palos Verdes Peninsula Transit Authority currently provides transit service in the vicinity of the proposed project.

The project trip generation, as shown in Table 4.8-4, was adjusted by values set forth in the CMP (i.e. person trips equal 1.4 times vehicle trips, and transit trips equal 3.5 percent of the total person trips) to estimate transit trip generation. Pursuant to the CMP guidelines, the proposed project is forecast to generate demand for two transit trips during the weekday AM peak hour and two transit trips during the weekday PM peak hour. Over a 24-hour period, the proposed Project is forecast to generate demand for 24 daily transit trips. The calculations are as follows:

- AM Peak Hour = 33 × 1.4 × 0.035 = 2 Transit Trips
- PM Peak Hour = 44 × 1.4 × 0.035 = 2 Transit Trips
- Daily Trips = 480 × 1.4 × 0.035 = 24 Transit Trips

Traffic Impact Assessment Scenarios. The analysis scenarios included in the impact discussion include:

- *Existing + Project Conditions*
- *Cumulative + Project Conditions*

b. Project Impacts and Mitigation Measures.

Impact T-1 Project-generated traffic would increase traffic volumes and incrementally reduce levels of service at each of the five study intersections. However, the level of service impact would not exceed City thresholds at any intersection. Therefore, impacts to study area intersections would be Class III, *less than significant*.

As previously presented in Table 4.8-3, the five key study intersections currently operate at LOS D or better during the AM and PM peak hours.

Table 4.8-9 shows the existing and existing plus project ICU or delay, levels of service, and the respective V/C increases for study area intersections during the AM and PM peak hours. Table 4.8-10 shows the existing, Year 2015 cumulative development and Year 2015 cumulative development plus project ICU or delay, levels of service, and the respective V/C increases for study area intersections during the AM and PM peak hours. See Figures 5-4, 5-5, 6-6 and 6-7 in the Traffic Impact Analysis, in Appendix G of this document, for illustrations of the existing

plus project AM and PM peak hour traffic volumes and Year 2015 cumulative plus project AM and PM peak hour traffic volumes at each study area intersection.

As shown in Tables 4.8-9 and 4.8-10 on the following page, all study area intersections would continue to operate at an acceptable LOS under existing plus project conditions and under Year 2015 cumulative development plus project conditions. The five key intersections currently operate and are forecast to operate at an acceptable level of service during the AM and PM peak hours with the existing of project generated traffic to both the existing and cumulative traffic scenarios.

Mitigation Measures. As discussed above, the proposed project would result in less than significant impacts to intersection operations both in combination with existing conditions and cumulative Year 2015 traffic conditions. As impacts would be less than significant, no mitigation measures would be required.

Significance After Mitigation. Impacts are less than significant without implementation of mitigation.

Impact T-2 Project-generated traffic would not exceed LOS standards for Crestridge Road. Therefore, impacts to street segments would be Class III, *less than significant*.

A roadway level of service analysis was prepared for Crestridge Road between Highridge Road and Crenshaw Boulevard pursuant to City of Rancho Palos Verdes requirements. The roadway level of service analysis is based on the two-lane roadway criteria contained in the *Los Angeles County Traffic Impact Analysis Guidelines* dated January 1, 1997.

Peak hour traffic volumes were developed for all City required traffic volume scenarios. Under Year 2015 traffic conditions (existing traffic plus ambient growth traffic plus cumulative projects traffic plus project traffic), Crestridge Road would continue to operate at LOS A in the Year 2015 during the AM and PM peak hours, without or with traffic from the proposed project. This conclusion is based on a roadway capacity of 2,500 passenger cars per hour. Current peak hour volumes are approximately 612 trips in the AM peak hour and 573 trips in the PM peak hour, and future (2015) cumulative scenario volumes plus project traffic are forecasted at approximately 650 trips in the AM peak hour and 616 trips in the PM peak hour. With addition of project-generated trips in either scenario, V/C increases would be under 0.01 and LOS would be maintained at LOS A, thus resulting in a less than significant impact. For further detail, see the Traffic Impact Analysis for the Crestridge Project, prepared by Linscott, Law and Greenspan, (LLG) Engineers, included as Appendix G in this EIR.

Mitigation Measures. As impacts would be less than significant, mitigation would not be required.

Significance after Mitigation. Impacts would be less than significant without mitigation.

Table 4.8-9 Existing Plus Project Intersection Capacity Analysis

Intersection	Time Period	Existing Conditions		Existing Plus Project Traffic Conditions		Project Significant Impact?	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM Increase	Y/N
Crenshaw Blvd at Indian Peak Rd	AM PM	0.558 0.509	A A	0.562 0.513	A A	0.004 0.004	No No
Crenshaw Blvd at Crestridge Rd	AM PM	0.545 0.412	A A	0.549 0.415	A A	0.004 0.003	No No
Crenshaw Blvd at Crest Rd	AM PM	19.4 sec/veh 11.9 sec/veh	C B	19.4 sec/veh 11.9 sec/veh	C B	0.0 sec/veh 0.0 sec/veh	No No
Highridge Rd at Hawthorne Blvd	AM PM	0.851 0.702	D C	0.851 0.707	D C	0.004 0.005	No No
Highridge Rd at Crestridge Rd	AM PM	13.5 sec/veh 10.4 sec/veh	B B	13.7 sec/veh 10.5 sec/veh	B B	0.2 sec/veh 0.1 sec/veh	No No

Source: Linscott, Law and Greenspan, June 2012

Table 4.8-10 Year 2015 Peak Hour Intersection Capacity Analysis

Intersection	Time Period	Existing Traffic Conditions		Year 2015 Cumulative Traffic Conditions		Year 2015 Cumulative Plus Project Traffic Conditions		Project Significant Impact?	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM Increase	Y/N
Crenshaw Blvd at Indian Peak Rd	AM PM	0.558 0.509	A A	0.588 0.543	A A	0.592 0.547	A A	0.004 0.004	No No
Crenshaw Blvd at Crestridge Rd	AM PM	0.545 0.412	A A	0.568 0.438	A A	0.572 0.441	A A	0.004 0.003	No No
Crenshaw Blvd at Crest Rd	AM PM	19.4 sec/veh 11.9 sec/veh	C B	23.4 sec/veh 13.3 sec/veh	C B	23.4 sec/veh 13.4 sec/veh	C B	0.0 sec/veh 0.1 sec/veh	No No
Highridge Rd at Hawthorne Blvd	AM PM	0.847 0.702	D C	0.892 0.764	D C	0.896 0.768	D C	0.004 0.004	No No
Highridge Rd at Crestridge Rd	AM PM	13.5 sec/veh 10.4 sec/veh	B B	14.3 sec/veh 10.8 sec/veh	B B	14.5 sec/veh 10.9 sec/veh	B B	0.2 sec/veh 0.1 sec/veh	No No

Source: Linscott, Law and Greenspan, June 2012

Impact T-3 Project-generated traffic would not affect vehicle storage capacity at the intersection of Crenshaw Boulevard/Crestridge Road. Storage capacity for the westbound left-turn lane at the intersection of Highridge Road/Hawthorne Boulevard is currently inadequate and would remain inadequate in the Year 2015 scenario. However, project generated traffic would not exacerbate issues with storage capacity. Therefore, impacts to intersection queuing would be Class III, *less than significant*.

An evaluation of the stacking/storage requirements of specific turn lanes for the key study intersections of Crenshaw Boulevard/Crestridge Road and Highridge Road/Hawthorne Boulevard was conducted. The queuing evaluation was based on the Highway Capacity Manual (HCM) signalized methodology. For a detailed description of the methodology used to perform this assessment see Appendix G, *Traffic Impact Analysis*, of this EIR.

The following locations were evaluated:

- Eastbound left-turn lane for the Crenshaw Boulevard/Crestridge Road intersection;
- Eastbound shared left-through lane for the Crenshaw Boulevard/Crestridge Road intersection; and
- Westbound left-turn lane for the Highridge Road/Hawthorne Boulevard intersection.

Based on the results of the queuing analysis, under the Existing plus Project scenario the eastbound left-turn lane and eastbound shared left-through lane at the intersection of Crenshaw Boulevard/Crestridge Road currently provide and are forecast to continue to provide adequate storage during the AM and PM peak hours with the addition of traffic from the proposed project under both the Existing plus Project and Year 2015 plus Project scenarios. Though the striped storage capacity for the eastbound left-turn lane is 250 feet, vehicles can store beyond the storage reservoir due to the presence of a two-way-left-turn-lane along Crestridge Road. See Table 14-4 in the *Traffic Impact Analysis,* included as Appendix G, for more detail. Similarly, the striped storage capacity for the eastbound shared left-through lane is 75 feet, however vehicles can store beyond the storage reservoir due to this lane continuing as the through lane along Crestridge Road. See Table 14-5 in the *Traffic Impact Analysis,* included as Appendix G, for more detail.

The queuing analysis also determined that the westbound left-turn lane at the intersection of Highridge Road/Hawthorne Boulevard does not currently provide adequate storage during the AM and PM peak hours. Although this location does not currently provide adequate storage, it should be noted that the proposed project would not exacerbate the existing deficient storage capacity for the westbound left-turn lane. Under the Existing scenario, the queue remains 264 feet during the AM peak hour and 418 feet during the PM peak hour both without and with the proposed project. Under the Year 2015 scenario, the queue remains 308 feet during the AM peak hour and 506 feet during the PM peak hour both without and with the proposed project.

Mitigation Measures. As impacts would be less than significant, mitigation would not be required.

Significance after Mitigation. Impacts would be less than significant without mitigation.

Impact T-4 Vehicles exiting and entering the site would experience delays equivalent to LOS B during the AM and PM peak period for Year 2015 traffic conditions. In addition, review of the current site plan indicates that the proposed project driveway would provide an adequate storage reservoir to accommodate vehicles entering the site. The internal circulation system is also deemed to be adequate. Therefore, impacts related to site access and internal circulation would be Class III, *less than significant*.

As described previously, access to the proposed project will be provided via one full-access unsignalized gated driveway located along Crestridge Road. As described previously, access to the proposed project would be provided via one full-access unsignalized gated driveway located along Crestridge Road. Review of the proposed site plan presented in Figure 2-4 in Chapter 2.0, *Project Description*, shows that the proposed project driveway is located opposite existing driveways for the Peninsula Community Church. It should be noted that the church typically experiences its heaviest vehicular activity on Sundays, while the proposed project would generally experience its heaviest vehicular activity during the weekday AM and PM peak hours. In order to validate that the Church's weekday traffic activity is minimal and that the heaviest vehicular activity is on Sunday, church administration staff was contacted to obtain information on its weekday programs. As provided by church staff, a pre-school program is provided on site Monday through Friday between 9:00 AM and 12:00 PM for approximately 30 children. Approximately 25 to 30 vehicles arrive and depart the site just before 9:00 AM and just after 12:00 PM for the preschool program. On Wednesdays, the Peninsula Community Church has an evening program between 6:30 PM and 8:30 PM for children/youths/adults. Approximately 50 vehicles arrive 15 minutes prior to 6:30 PM and leave 15 minutes after 8:30 PM for the Wednesday evening program. As a result, based on the above weekday programs, the church's weekday traffic activity is minimal and conflicts between vehicles making a left-turn out of the project site and vehicles making a left-turn out of the existing Peninsula Community Church driveway across the street and to the east would be minimal.

Level of service calculations were performed at the driveway for the proposed project in order to determine the delay for vehicles waiting to turn left into the site and the delay for vehicles waiting to turn left or right out of the site assuming a one-way stop. The LOS calculations for the proposed project driveway are based on Year 2015 plus Project AM peak hour and PM peak hour traffic volumes. The results of the analysis indicate that vehicles making a left-turn into the site would experience a delay of 7.6 seconds per vehicle (LOS A) during the AM peak hour and a delay of 8.2 seconds per vehicle (LOS A) during the PM peak hour. Vehicles making a left-turn or right-turn out of the site would experience a delay of 11.3 seconds per vehicle (LOS B) during the AM peak hour and a delay of 12.3 seconds per vehicle (LOS B) during the PM peak hour. Overall, the proposed project driveway is forecast to operate at LOS B during the AM and PM peak hours for Year 2015 traffic conditions. As such, motorists entering and exiting the site would be able to do so comfortably, safely, and without undue congestion.

In addition, an assessment of the required storage reservoir for the proposed project's gated entry along Crestridge Road was undertaken. Experience has proven that poorly designed gated entries with inadequate storage capacities often times create an adverse effect on the operating characteristics of the street network. For a detailed description of the methodology used to perform this assessment see Appendix G, *Traffic Impact Analysis*, of this EIR.

Based on the vehicular stacking analysis undertaken, the proposed project driveway along Crestridge Road is expected to have a maximum queue of two "visitor/guest" vehicles during the AM and PM peak hours. This queue would require a storage reservoir length of approximately 44 feet between the call box and the back of the sidewalk to satisfy the maximum vehicle queue. Review of the proposed project site plan (Figure 2-2) shows that the proposed project driveway would provide adequate storage. See Table 9-1 in the *Traffic Impact Analysis* in Appendix G for further detail.

Finally, the on-site circulation layout of the proposed project was examined and found to be adequate on an overall basis. Curb return radii have been confirmed and are generally adequate for small service/delivery (FedEx, UPS) trucks, trash trucks and fire trucks.

Mitigation Measures. Impacts related to site access and internal circulation would be less than significant; therefore, no mitigation measures would be required. However, the following mitigation measure is *recommended* to further improve site circulation and access.

T-4 **Site Access.** Install a stop sign and stop bar at the proposed project driveway on Crestridge Road. This feature shall be shown on all project plans submitted for building permit review.

Significance After Mitigation. Impacts would be less than significant without implementation of mitigation.

Impact T-5 **Adequate vertical sight distance would be provided from the proposed project driveway to the crest on Crestridge Road. However, a motorist's sight distance could be obstructed by future project landscaping and/or hardscape along the project frontage. This is a Class II, *significant but mitigable* impact.**

A sight distance evaluation was prepared for the proposed project driveway along Crestridge Road. The posted speed limit on Crestridge Road is 40 mph; however, to be conservative a design speed of 50 mph was utilized in the sight distance evaluation. Minimum stopping sight distance was utilized for this evaluation and is defined in the Caltrans Highway Design Manual (HDM) as the distance required by the driver of a vehicle, traveling at a given speed, to bring his/her vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eyes, which are assumed to be 3.5 feet above the pavement surface, to an object 0.5-foot high on the roadway. Based on the criteria set forth in Table 201.1 of the Caltrans HDM, a minimum stopping sight distance of 430 feet is required.

To determine the impact of the vertical crest on Crestridge Road, a field investigation was conducted at the site to determine the distance between the proposed project driveway and the crest on Crestridge Road. The field study revealed that a sight distance of approximately 520

feet is provided between the mid-point of the proposed project driveway and the crest. With a minimum of 520 feet of sight distance provided between the proposed project driveway and the crest, adequate vertical sight distance would be provided.

Figure 4.8-5 presents a schematic of the sight distance evaluation performed at the proposed driveway, which illustrates the actual sight distances and corresponding limited use areas. As shown, a motorist's sight distance may be obstructed by future project landscapes and/or hardscapes along project frontage. This is considered a significant but mitigable impact.

Mitigation Measure. The following mitigation measure is required to ensure adequate sight distance is maintained at the proposed project driveway.

T-5 **Maintain Sight Distance.** Final project plans shall show that landscaping and/or hardscape at or near the proposed project driveway is designed such that a driver's clear line of sight is not obstructed.

Significance After Mitigation. Following implementation of the above mitigation measure, impacts related to sight distance at the proposed project driveway would be reduced to less than significant.

Impact T-6 **Project-generated trips at identified Congestion Management Program (CMP) locations would be below CMP thresholds for arterial monitoring intersection locations. Also, there are no CMP freeway monitoring locations in the vicinity of the proposed project. In addition, the existing transit service in the project area would adequately accommodate the increase of project generated transit trips. Impacts would therefore be Class III, *less than significant*.**

As stated previously, the CMP guidelines require that arterial monitoring intersection locations must be examined if the proposed project will add 50 or more trips during either the AM or PM weekday peak hours (of adjacent street traffic) at CMP monitoring intersections. Based on the proposed project's trip generation potential, trip distribution and trip assignment, the proposed project would not add 50 or more trips at the identified CMP intersections during either the weekday AM peak hour or PM peak hour. Therefore, a CMP intersection traffic impact analysis is not required. Also, there are no CMP freeway monitoring locations in the vicinity of the proposed project. Therefore, a CMP freeway traffic impact analysis is not required.

Also required by the current CMP is a review of the potential impacts of the project on transit service. Based on the proposed project's forecast demand for 24 daily transit trips, as outlined in previously in *Methodology*, the existing transit service in the project area would adequately accommodate the increase of project generated transit trips. In addition, based on the calculated number of generated transit trips, no project impacts on future transit services in the project area would be expected to occur. Based on this, the proposed project would have a less than significant impact on the LA County CMP.

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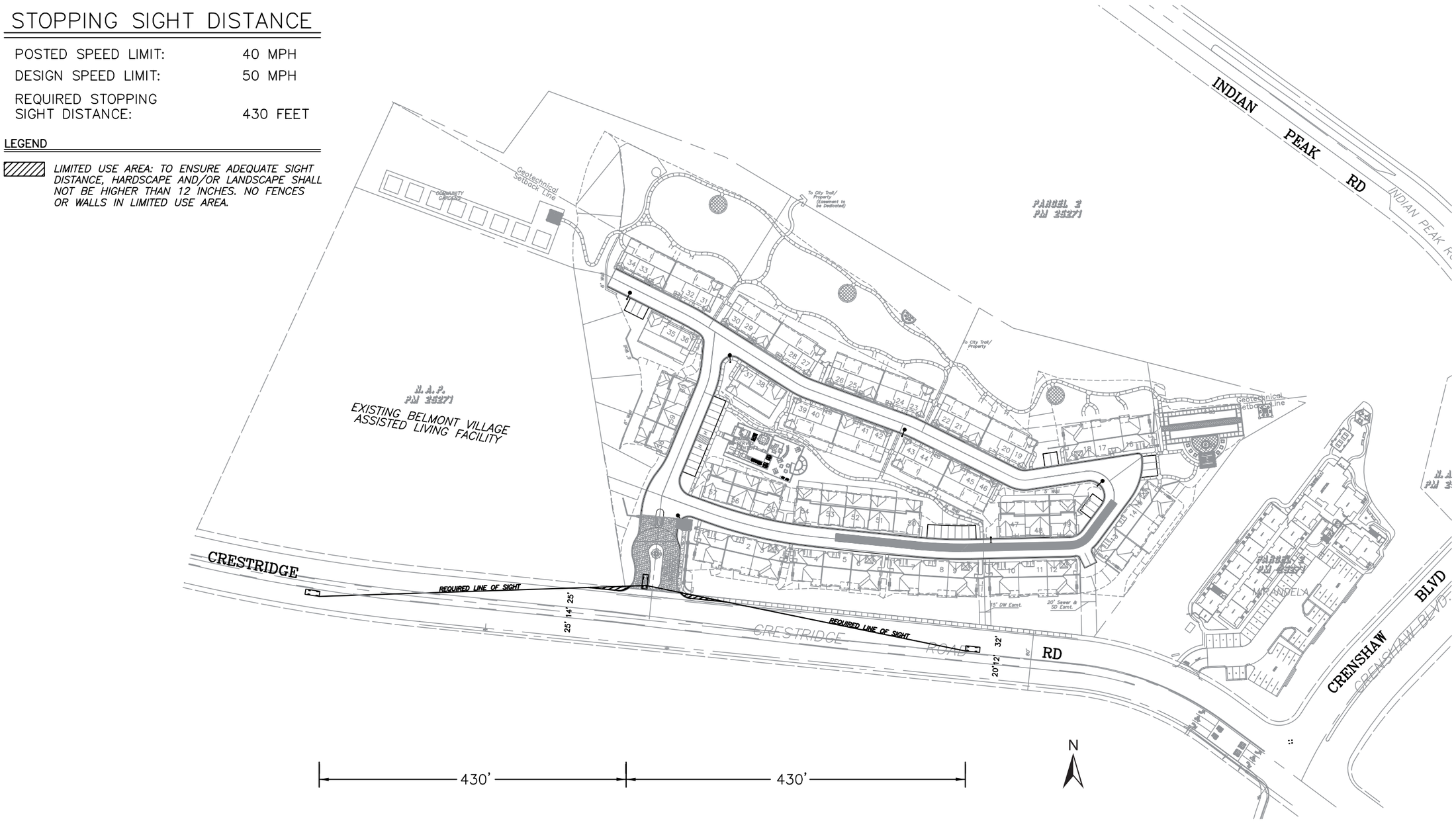

Sight Distance Evaluation
Crestridge Road at Proposed
Project Driveway

Figure 4.8-5

Source: Lanscott Law & Greenspan, June 21, 2012.

Mitigation Measures. Mitigation would not be required.

Significance after Mitigation. Impacts on the CMP would be less than significant without mitigation.

Impact T-7 Access to Crestridge Road and the project site during project grading and construction would be provided via Highridge Road and Crenshaw Boulevard. Although there would be an increase of traffic during grading and construction, construction traffic would not result in any significant impacts to key study intersections. Therefore, impacts relating to construction traffic would be Class III, *less than significant.*

Construction of the proposed project is estimated to require export of approximately 143,000 cubic yards of soil as a result of planned grading. Construction activities associated with soil export include: 1) clearing and grubbing; 2) rough grading; and 3) precise grading/site preparation/underground. Table 4.8-11 shows the assumptions made in order to forecast the potential construction related trips associated with the soil export construction activities at the project site for each of these three construction phases.

Table 4.8-11
Soil Export Traffic Assumptions

Construction Phase	Assumptions
Clearing and Grubbing	• 7,150 cubic yards to be exported • Five-day work week (Monday through Friday from 8:15 AM to 4:15 PM) • Anticipated to last approximately 20 days • All trucks have 20 cubic yards capacity • Total of 5 employees on-site Monday through Friday from 8:15 AM to 4:15 PM
Rough Grading	• 114,400 cubic yards to be exported • Five-day work week (Monday through Friday from 8:15 AM to 4:15 PM) • Anticipated to last approximately 80 days. • All trucks have 20 cubic yards capacity • Total of 10 employees on-site Monday through Friday from 8:15 AM to 4:15 PM
Precise Grading/Site Preparation/Underground	• 21,450 cubic yards to be exported • Five-day work week (Monday through Friday from 8:15 AM to 4:15 PM) • Anticipated to last approximately 80 days • All trucks have 20 cubic yards capacity • Total of 10 employees on-site Monday through Friday from 8:15 AM to 4:15 PM

In addition to the assumptions in Table 4.8-11 for each construction phase requiring soil export, the following assumptions were utilized for truck trips and employee trips:

- Each truckload requires an inbound trip and an outbound trip
- The daily number of truck trips was averaged over the eight-hour workday to obtain the number of peak hour truck trips (50% entering and 50% exiting)
- All truck trips were converted to passenger car equivalents (P.C.E.) using a P.C.E. factor of 3.0.
- Each employee would make 4 trips per day (one during the AM peak hour, two during the lunch hour and one during the PM peak hour).

Using all of the assumptions listed above, Table 4.8-12 provides a summary of the forecast construction peak hour and daily traffic volumes for each of the three soil export phases of construction. As shown in the table, the greatest amount of construction-related traffic will be generated during the rough grading phase, generating 472 daily trips with 64 trips produced during both the AM and PM peak hours. As a result, the following assessment focuses on the potential impacts associated with the rough grading construction phase as a worst-case scenario.

Table 4.8-12
Construction-Related (Soil Export) Traffic Generation

Construction Phase	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Clearing and Grubbing							
Construction Truck Traffic (3 Trucks)	36	3	2	5	3	2	5
Passenger Car Equivalent Factor [1]	3	3	3	3	3	3	3
Subtotal	108	9	6	15	9	6	15
Employees (5 Employees)	20	5	0	5	0	5	5
Total Clearing and Grubbing	**128**	**14**	**6**	**20**	**9**	**11**	**20**
Rough Grading							
Construction Truck Traffic (9 Trucks)	144	9	9	18	9	9	18
Passenger Car Equivalent Factor [1]	3	3	3	3	3	3	3
Subtotal	432	27	27	54	27	27	54
Employees (10 Employees)	40	10	0	10	0	10	10
Total Rough Grading	**472**	**37**	**27**	**64**	**27**	**37**	**64**
Precise Grading/Site Preparation/Underground							
Construction Truck Traffic (2 Trucks)	28	2	2	4	2	2	4
Passenger Car Equivalent Factor [1]	3	3	3	3	3	3	3
Subtotal	84	6	6	12	6	6	12
Employees (10 Employees)	40	10	0	10	0	10	10
Total Precise Grading/Site Prep/UG	**124**	**16**	**6**	**22**	**6**	**16**	**22**

[1] A passenger car equivalent factor of 3.0 was applied to the truck trips to convert them into passenger car trips
Source: Linscott, Law and Greenspan, June 2012

Rough Grading Construction-Traffic. The City of Rancho Palos Verdes has identified the following haul route for all construction and rough grading trucks.

- All loaded trucks shall use Crestridge Road to Highridge Road to Hawthorne Boulevard to export all materials.
- All unloaded trucks shall use Crenshaw Boulevard to Crestridge Road to access the site.

Based on the anticipated AM and PM peak hour construction traffic volumes associated with the rough grading construction component shown in Table 14.8-12, the existing plus construction traffic level of service analysis at the five key study intersections for the rough grading phase was undertaken. The results of this analysis are summarized in Table 14.8-13.

Table 4.8-13 Existing Plus Construction Traffic Peak Hour Intersection Capacity Analysis - Rough Grading Phase

Intersection	Time Period	Existing Conditions		Existing Plus Construction Traffic Conditions		Significant Impact?	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM Increase	Y/N
Crenshaw Blvd at Indian Peak Rd	AM PM	0.558 0.509	A A	0.558 0.518	A A	0.000 0.009	No No
Crenshaw Blvd at Crestridge Rd	AM PM	0.545 0.412	A A	0.545 0.417	A A	0.000 0.005	No No
Crenshaw Blvd at Crest Rd	AM PM	19.4 sec/veh 11.9 sec/veh	C B	19.4 sec/veh 11.9 sec/veh	C B	0.0 sec/veh 0.0 sec/veh	No No
Highridge Rd at Hawthorne Blvd	AM PM	0.847 0.702	D C	0.864 0.702	D C	0.017 0.000	No No
Highridge Rd at Crestridge Rd	AM PM	13.5 sec/veh 10.4 sec/veh	B B	13.8 sec/veh 10.7 sec/veh	B B	0.3 sec/veh 0.3 sec/veh	No No

Source: Linscott, Law and Greenspan, June 2012

As shown in Table 14.8-13, all five key study intersections are forecast to operate at acceptable levels of service during the AM and PM peak hours for existing plus construction traffic conditions; therefore, no construction traffic impacts associated with the rough grading phase are anticipated. Given that no construction traffic impacts are anticipated for the rough grading phase, it can be concluded that the remaining construction phases (i.e. clearing/grubbing and precise grading/site preparation/underground) would also have no significant impacts at the five key study intersections, as they have a lesser trip generation potential than that of the rough grading phase.

Mitigation Measures. Mitigation is not required.

Significance After Mitigation. Impacts would be less than significant without mitigation. Please sections 4.2, *Air Quality*, 4.6, *Hydrology and Water Quality*, and 4.7, *Noise* for a discussion of additional impacts related to project grading and construction.

c. Cumulative Impacts. The analyses under Impacts T-1 and T-2 consider cumulative growth through the Year 2015. As noted under those discussions, cumulative growth would

not result in cumulative impacts at any of the five key study intersections or result in significant impacts to the Crestridge Road roadway segment.