APPENDIX H

TRANSPORTATION

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MEMORANDUM

To:	Kenneth A. Ehrlich Jeffer Mangels Butler & Mitchell, LLP	Date:	October 22, 2013
From:	David S. Shender, P.E. Corinna M. Gutierrez Linscott, Law & Greenspan, Engineers	LLG Ref:	5-13-0064-1
Subject:	**Traffic and Parking Assessment for the Broad Beach Restoration Project**		

This memorandum has been prepared by Linscott, Law, & Greenspan, Engineers (LLG) to summarize our traffic and parking assessment for the proposed Broad Beach Restoration Project ("the Project") located in the City of Malibu, California. The Project entails the hauling of 600,000 cubic yards of sand to Broad Beach from an off-site quarry to restore the beach and protect it from further erosion. The purpose of the following traffic and parking assessment is to determine traffic operations to and from the site and evaluate potential traffic and parking related impacts.

Project Description

Broad Beach is located in the City of Malibu, approximately two miles east of State Route 23 (SR-23) and north of Zuma Beach. Due to the current erosion of Broad Beach, the Broad Beach Geologic Hazard Abatement District (BBGHAD) has been tasked to restore Broad Beach by hauling approximately 600,000 cubic yards of sand to the beach over a period of six months. Trucks will haul sand from up to three quarries located in the Fillmore, Simi Valley, and Moorpark areas and dump the sand near the north Zuma Beach parking lot (County Lot 12). Lot 12 is located along the south side Pacific Coast Highway (PCH), approximately 1,000 feet east of the Trancas Canyon Road/Pacific Coast Highway intersection. Lot 12 will be temporarily utilized as a staging area and dump site during the six month hauling period, and therefore closed to the general public. The construction period would start no earlier than mid/late September and be completed prior to the following summer peak beach visitation period. The Project site general vicinity and location are shown in ***Figure 1***. The Project site staging area is shown in ***Figure 2***.

Construction Assumptions

The type and number of equipment needs, both on-site and off-site, as well as anticipated number of construction worker trips associated with the hauling phase of the Project have been determined based on information provided by the Project applicant and its consultants. It is estimated that 15 construction workers will be on-site during the hauling phase of the Project. As previously mentioned, it is assumed that hauling would occur over a period of six months. The estimated amount of sand to be imported is approximately 600,000 cubic yards of material. It is anticipated that equipment storage and construction worker parking during the hauling phase will

occur on the Project site, either within the Zuma Beach parking lot staging area or on Broad Beach itself.

Haul trucks are anticipated to travel to the site five days a week (Monday through Friday), 11 hours per day (beginning approximately at 7:00 AM and ending approximately at 6:00 PM). Double trailer bottom dump trucks with a capacity of 20 cubic yards of material carrying 14 cubic yards of sand are planned to be used for the Project. It is estimated that 30 trucks will arrive at and depart the staging area every hour, which is equivalent to approximately 330 trucks per day, or 660 truck *trips* per day (330 inbound trips and 330 outbound trips).

Site Circulation and Temporary Traffic Improvements

As previously noted, Lot 12 will be utilized as a staging area and dumping ground for the imported sand. Currently, vehicular access to Lot 12 is provided by the main primary Zuma Beach internal circulation roadway. However, during construction, it is proposed that this circulation road be closed south of the existing structure located south of Lot 12 to prevent general public access. Thus, to facilitate construction of the Project, vehicular access to the staging area will be provided via two temporary driveways on Pacific Coast Highway. A description of the Project site driveways is provided in the following paragraphs:

- *Inbound PCH Driveway:*
  The inbound PCH project site driveway will be located on the south side of Pacific Coast Highway, at the east end of Lot 12 directly across from Guernsey Avenue. This temporary driveway will serve as an inbound only driveway for Project vehicles and haul trucks. The inbound PCH driveway will accommodate limited vehicular ingress access (i.e., right-turn only ingress turning movements). No outbound turning movements will be permitted from this temporary driveway.

- *Outbound PCH Driveway:*
  The outbound PCH project site driveway will be located on the south side of Pacific Coast Highway, at the west end of Lot 12. This driveway will serve as an outbound only driveway for Project vehicles and haul trucks. The outbound PCH driveway will accommodate full vehicular egress access (i.e., both left-turn and right-turn egress turning movements. No inbound turning movements will be permitted at this driveway.

To facilitate traffic operations into and out of the site, additional temporary traffic improvements are proposed. First, a temporary eastbound right-turn/deceleration paved lane will be installed at the existing Guernsey Avenue/Pacific Coast Highway intersection to ensure that Project truck traffic will safely and efficiently slow to turn right into Lot 12 and not impede eastbound Pacific Coast Highway through traffic. In addition, at the Project's outbound PCH driveway, a temporary traffic signal is proposed to be installed to facilitate the safe and efficient movement of outbound haul trucks onto westbound Pacific Coast Highway. The Project site circulation and temporary traffic improvements are illustrated in ***Figure 3***.

Existing parking along the south shoulder of PCH will need to be prohibited during the period of construction to accommodate the recommended right-turn lane and minimize pedestrian traffic at both Project driveways. As shown on *Figure 3*, the proposed parking prohibition on the south shoulder of PCH generally adjacent to Lot 12 would be implemented in two segments:

- The segment between the proposed inbound driveway opposite Guernsey Avenue and the proposed outbound driveway (a distance of approximately 660 feet); and

- The segment west of the proposed inbound driveway to a point approximately 180 west thereof (to join the existing restricted shoulder parking area on the PCH bridge over Trancas Creek).

As shown on *Figure 3*, the 660-foot segment can accommodate approximately 33 parked cars (assuming 20 feet of shoulder length for each parked car) and the 180-foot shoulder segment can accommodate approximately 9 parked cars, or 42 parked cars in total. This shoulder parking on PCH is generally used by beach visitors, primarily on weekends and in the summer. While the proposed parking prohibition is intended to facilitate the safe and efficient traffic flow of construction-related vehicles, it is noted that Lot 12, the portion of Zuma Beach adjacent to Lot 12, and Broad Beach will be closed to the general public during the Project construction period. Thus, from a pedestrian safety standpoint, it is preferred to prohibit shoulder parking in this area for purposes of discouraging pedestrian traffic adjacent and through the construction area.

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Truck Haul Route

The truck haul routes have been determined based on the three quarry locations in the Fillmore, Simi Valley, and Moorpark areas. Each of the truck haul routes approach the Project site from the west via PCH. Note that the Caltrans Truck Networks restricts through traffic on SR-1 PCH, between SR-27 Topanga Canyon Boulevard and SR-23 Decker Road, for 4 or more axle trucks. However, the restriction does not apply to the Project haul trucks because only part of the segment is being utilized for a local delivery of sand to the Project site. The full truck haul routes can be found in ***Figure 4*** and specific routes to PCH from each of the quarries are as follows:

- *Grime Rock Sand Quarry:*
  The Grime Rock Sand Quarry is located at 3500 Grimes Canyon Road in Fillmore, California. Haul trucks will depart from the quarry site going north via Grimes Canyon Road/SR-23 and take Chambersburg Road/SR-23 to westbound Ventura Street/SR-126. Following, the haul trucks will travel southbound to PCH via SR-118, Santa Clara Avenue, Central Avenue, southbound SR-101, and Las Posas Road, successively.

- *P.W. Gillibrand Quarry (2 Alternate Routes):*
  The P.W. Gillibrand Quarry is located at 5000-5599 Bennett Road in Simi Valley, California. For the first alternate route, haul trucks will depart from the quarry site going south on Bennett Road and take Tapo Canyon Road to westbound SR-118. Following, the haul trucks will travel via southbound SR-23 and northbound SR-101 to get to Las Posas Road connecting to PCH.

  For the second alternate route, haul trucks will also depart from the quarry site going south on Bennett Road and take Tapo Canyon Road to westbound SR-118. Following, the haul trucks will travel via southbound SR-23 and northbound SR-101. Finally, haul trucks will travel southbound to PCH via the Pleasant Valley Road/Santa Rosa Road, S. Lewis Road, Hueneme Road, and Las Posas Road, successively.

- *CEMEX Quarry:*
  The CEMEX Quarry is located at 9035 Roseland Avenue in Moorpark, California. Haul trucks will depart from the quarry site going south via Roseland Avenue and take Happy Camp Road, Broadway Road, and Grimes Canyon road, successively, to westbound SR-118. Following, the haul trucks will travel southbound to PCH via Somis Road/SR-34, S. Lewis Road, Hueneme Road, and Las Posas Road, successively.

After the haul trucks are emptied at the Project site, the haul trucks will exit the staging area at the proposed temporary signalized outbound PCH driveway, turning left onto westbound PCH and continuing via the same route in reverse to return to their respective quarry sites. The total round trip distance of the truck haul route is approximately 52 miles for the Grime Rock Sand Quarry, 56 or 55 miles for each of the alternates to the P.W. Gillibrand Quarry, and 39 miles for the CEMEX Quarry.

Emergency Vehicle Access

Emergency vehicle access will continue to be provided to the building located just east of the project staging area. Currently, access to the building is provided from both the east (via Lot 11) and west (via Lot 12). During the hauling period of the Project, the Zuma Beach internal circulation roadway between Lot 11 and Lot 12 (the Project staging area) will be prohibited to the public. However, emergency vehicles will still be able to gain access to the building. Both the proposed inbound PCH driveway and outbound PCH driveway can also be utilized as access points for emergency vehicles during construction of the Project.

Existing Street System

The following intersections are evaluated in this traffic impact assessment for potential traffic impacts due to the Project:

1. Decker Road / Pacific Coast Highway
2. Trancas Canyon Road-Broad Beach Road / Pacific Coast Highway
3. Outbound Project Driveway / Pacific Coast Highway
4. Guernsey Avenue-Inbound Project Driveway / Pacific Coast Highway
5. Heathercliff Road / Pacific Coast Highway
6. Kanan Dume Road / Pacific Coast Highway

The intersections selected for analysis were identified as they are located closest to the Project site, and therefore have the greatest potential to have adverse traffic impacts related to the project. The lane configurations and traffic control devices at the study intersections are provided on ***Figure 5***.

Existing Traffic Volumes

Traffic counts at the four study intersections not adjacent to the project site were obtained from the *Traffic Study for Trancas Country Market*, prepared by Katz, Okitsu & Associates in September 2007. For the intersection of Guernsey Avenue-Inbound Project Driveway/Pacific Coast Highway, manual traffic counts were conducted on Tuesday, August 27, 2013 during the AM and PM peak hours. The

traffic count sheets can be found in ***Appendix A***. Furthermore, the aforementioned intersection counts were extrapolated to determine eastbound and westbound through traffic on Pacific Coast Highway at the Outbound Project Driveway/Pacific Coast Highway intersection. The 2007 and 2013 traffic volumes were then adjusted by a conservative 1% growth factor to obtain the existing baseline for the analysis year 2014 during the AM and PM peak hours. The existing traffic volumes utilized in the traffic impact analysis are illustrated in ***Figure 6***.

Project Trip Generation and Trip Distribution

As previously mentioned, it is estimated that 30 trucks will arrive at and depart the staging area every hour, which is equivalent to approximately 330 trucks per day, or 660 truck *trips* per day (330 inbound trips and 330 outbound trips). To conservatively estimate the equivalent number of vehicles associated with the trucks, a passenger car equivalency factor of 2.0 truck trips was utilized based on standard engineering practice. The use of the 2.0 passenger car equivalent (PCE) in the forecast of construction-related traffic is very conservative ("worst case") as the *Highway Capacity Manual 2010*[1] recommends a lower PCE factor of 1.5 for roadways similar in design to Pacific Coast Highway. Therefore, conservatively assuming 660 truck trips, it is estimated that trucks would generate approximately 1320 passenger car equivalent vehicle trips (i.e., 660 PCE inbound trips and 660 PCE outbound trips) on a daily basis. On a per hour basis, if it is estimated that there are 60 truck trips per hour (i.e., 30 inbound trips and 30 outbound trips), it is conservatively assumed that trucks would generate approximately 120 PCE vehicle trips (i.e., 60 inbound trips and 60 outbound trips) per hour.

Additionally, construction workers are expected to typically arrive at the Project site before 7:00 AM and most will depart after 6:00 PM. Thus, nearly all of the morning arriving construction worker trips and departing evening construction worker trips would occur outside the peak hours of PCH traffic. For example, the peak hour of traffic at the nearby Trancas Canyon Road/Pacific Coast Highway intersection begins at 7:15 AM during the morning commuter period, and begins at 4:15 PM during the afternoon commuter period. However, it was conservatively assumed that all of the inbound and outbound construction worker trips would occur during the AM and PM peak hours. It was also assumed for purposes of trip distribution that half of all construction worker trips would arrive from eastbound Pacific Coast Highway, while the other half of construction worker trips would arrive from westbound Pacific Coast Highway. Therefore, it is estimated that approximately 30 vehicle trips per day (i.e., 15 inbound trips and 15 outbound trips) would be generated by the construction workers during the hauling phase of the Project. During the peak hours, it is

[1] *Highway Capacity Manual 2010,* Transportation Research Board of the National Academy of Sciences, December 2010.

conservatively assumed that all of the construction workers would arrive during the AM peak hour (i.e., 15 inbound trips) and depart during the PM peak hour (i.e., 15 outbound trips).

Taken together, the construction worker vehicles and haul trucks are forecast to generate 1350 PCE vehicle trips per day (675 inbound trips and 675 outbound trips) during the hauling period of the project. During the weekday AM peak hour it is estimated that 135 PCE vehicle trips (75 inbound trips and 60 outbound trips) would be generated. Similarly, it is estimated that 135 PCE vehicle trips (60 inbound trips and 75 outbound trips) would be generated during the weekday PM peak hour. The Project trip generation forecast for the Project is summarized in ***Table 1***. The Project trip distribution for the haul trucks and construction workers is shown in ***Figure 7***. The new forecast traffic volumes associated with the Project are illustrated in ***Figure 8***. The traffic volume assignments presented in *Figure 8* reflects the traffic distribution characteristics shown in *Figure 7* and the traffic generation forecast presented in *Table 1*.

Traffic Impact Analysis

The signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method of analysis that determines Volumes-to-Capacity (*v/c*) ratios on a critical lane basis. The overall intersection *v/c* ratio is subsequently assigned a Level of Service (LOS) value to describe intersection operations. Level of Service varies from LOS A (free flow) to LOS F (jammed condition). The stop-controlled study intersections were evaluated using the Highway Capacity Manual (HCM) methodology which estimates the average control delay for each of the subject movements and determines the LOS for each constrained movement. A description of the ICU and HCM methods and corresponding Level of Service is provided in ***Appendix B***.

Traffic Impact Criteria and Thresholds

The relative impact of the added project traffic volumes to be generated by the Project during the AM and PM peak hours was evaluated based on analysis of existing operating conditions at the six study intersections, without and with the proposed project. The significance of the potential impacts of the project generated traffic was identified using the traffic impact criteria set forth in the City of Malibu's *Traffic Impact Analysis Guidelines*, August, 2012. According to the City's published traffic impact analysis guidelines, the impact is considered significant if the project-related increase in the delay per vehicle or *v/c* ratio equals or exceeds the thresholds or LOS becomes a certain level presented in following tables:

CITY OF MALIBU SIGNALIZED INTERSECTION IMPACT THRESHOLD CRITERIA		
Pre-Project *v/c*	**Level of Service**	**Project Related Increase in *v/c***
0.71 - 0.80	C	equal to or greater than 0.040
0.81 - 0.90	D	equal to or greater than 0.020
0.91 or more	E or F	equal to or greater than 0.010

CITY OF MALIBU UNSIGNALIZED INTERSECTION IMPACT THRESHOLD CRITERIA	
Project Related Increase in Delay	**Final LOS**
5 or more seconds	Degrades to LOS D or worse

Traffic Impact Analysis Scenarios

The traffic impact study evaluates the potential impacts of the Project for the following impact analysis conditions:

- Existing (Analysis Year 2014)
- Existing + Project

As previously noted, the existing traffic volumes at the study intersections are presented in *Figure 6*. The new project trips as shown on *Figure 8* were then added to the existing traffic volumes to derive the Existing plus Project traffic volumes shown on ***Figure 9***.

Level of Service Calculations

The traffic impact analysis prepared for the study intersections using ICU/HCM methodologies and application of the City of Malibu's significant impact criteria is summarized in ***Table 2***. The calculation worksheets are attached to this memorandum in *Appendix B.*

As indicated in column [2] of *Table 2* under "Existing Year 2014" conditions, all except one of the study intersections are operating at LOS D or better during both the AM and PM peak hours. The intersection of Kanan Dume Road/Pacific Coast Highway is operating at LOS E during the PM peak hour under existing conditions.

As indicated in column [3] of *Table* 2, application of the City's threshold criteria to the "Existing Year 2014 With Project" scenario indicates that the forecast changes in delay and *v/c* ratios at the study intersections due to Project-related traffic are forecast to be below the City's significance thresholds. Therefore, the traffic impacts of the Project in the Existing Plus Project condition will be less than significant for all the study intersections.

Queuing Analysis

An operational queuing analysis was also conducted to evaluate the potential queue of haul trucks exiting the staging area's outbound PCH driveway at the proposed temporary traffic signal. The estimated queue was determined using procedures outlined in the Highway Capacity Manual. The HCM back-of-queue calculation worksheets are contained in *Appendix B*. The potential queues for the staging area driveway are summarized in the following table:

Table 3
BACK-OF-QUEUE SUMMARY
STAGING AREA DRIVEWAY

Peak Hour	Average Queue (veh/lane)	95th Percentile Queue (veh/lane)
AM	1.2	2.5
PM	1.4	2.9

As noted above, the table reports the average queue expected during the AM and PM peak hours, as well as the 95th percentile queue. The 95th percentile queue essentially represents the highest queue that would be expected during the peak hour. As seen in the table above, the highest 95th percentile queue occurs during the PM peak hour for both options, with a 95th percentile queue ranging from 2.5 to 2.9 PCE, which is equivalent to approximately two truck lengths as discussed previously in the estimated truck trip generation section of this memorandum. Thus, the queue of vehicles exiting the staging area will be nominal and will not impact operations within the site.

Highway Segment Analysis

A highway segment analysis was prepared for the two-lane conventional highway segment of Pacific Coast Highway between Las Posas to Yerba Buena. The other segments of PCH within the Project study area are four-lane conventional highway segments with signalized intersections at major cross streets. The LOS of the four-lane segments is dependent on the LOS of the signalized cross streets as seen in the previous traffic impact analysis.

Traffic Volumes

Peak hour volumes on the PCH segment between Las Posas and Yerba Buena were obtained from Caltrans for year 2012 (the latest data available). Furthermore, the volumes were adjusted by a conservative 1% growth factor for the existing analysis year 2014. The added Project traffic volumes conservatively account for the haul trucks and construction workers during the peak hours. The following table depicts the peak hour volumes on the study segment of Pacific Coast Highway without and with the Project:

Table 4
EXISTING AND EXISTING+PROJECT PEAK HOUR TRAFFIC VOLUMES

PCH Segment	Existing	Project	Existing + Project
Las Posas to Yerba Buena	1173	135	1308

Level of Service

Note that the PCH segment between Las Posas to Yerba Buena also includes a passing lane segment with a separate LOS. The Level of Service calculations sheets are attached to this memorandum in ***Appendix C***. The following table shows the LOS of the 2-lane highway and passing lane segments:

Table 5
LEVEL OF SERVICE OF PCH SEGMENT BETWEEN LAS POSAS TO YERBA BUENA

Scenario	2-Lane Highway Segment	Passing Lane Segment
Existing	D	B
Existing + Project	D	B

Neither the LOS for the 2-lane highway nor passing lane segments changes with the added project traffic volumes on the PCH segment between Las Posas and Yerba Buena.

Other Affected Roadways

As noted above, the Project will result in less than significant traffic impacts at intersections and street segments along Pacific Coast Highway closest to the site. Beyond the study area, vehicle trips generated by the Project will disperse and therefore the adverse effects will further diminish. Thus, it is reasonable to conclude that traffic impacts on roadways beyond the study area will also be less than significant. The paragraphs below provide a brief description of these other affected roadways.

- Las Posas Road/PCH Interchange – The Las Posas Road/PCH interchange is located approximately 15 miles northwest of the Project. At this location, Project-related trips will diverge, with many construction-worker trips expected to continue north to/from Oxnard with trucks using Las Posas Road travelling to and from the quarry sites. The Las Posas Road interchange features two stop-controlled intersections on Las Posas Road with freeway-type ramps to and from PCH: for southbound Las Posas vehicles, a left-turn is required to access southbound PCH while for northbound PCH vehicles, a right-turn is required onto northbound Las Posas Road. Field reviews indicate that both of these movements operate with little or no delay for motorists. Thus, Project-related vehicles (approximately one truck every two minutes in each direction) are not expected to adversely impact current traffic operations at the interchange.

- Las Posas Road – Las Posas Road primarily provides one travel lane in each direction, similar to the two-lane segment of PCH analyzed herein (for which no significant traffic impacts were identified due to the Project). South of Pleasant Valley Road, the surrounding land uses are primarily agricultural in nature, which includes cars, as well as occasional truck trips serving farms in the area. Thus, the additional Project-related vehicles (approximately one truck every two minutes in each direction) would not adversely change the character or use of Las Posas Road. North of Pleasant Valley Road, additional travel lanes are provided on Las Posas Road, which would readily accommodate the limited additional trips generated by the Project.

- Lewis Road, SR-101, SR-34, SR-118, and Other External Travel Routes - As shown in *Figure 4*, the expected truck trips north of the Las Posas Road/Lewis Road intersection will further disperse among the multiple routes to be used to access the three sand source quarries. Accordingly, the traffic effects of the Project on these other travel routes external to the Project site would be de minimis.

Parking Assessment

A parking assessment was performed to measure the effect of the Project on the Zuma County Beach parking lots, as well as on-street parking on Pacific Coast Highway. According to the County of Los Angeles Department of Beaches and Harbors, there are approximately 2,025 off-street parking spaces within the entire Zuma County Beach, split across 12 adjacent parking lots. An overview plan of the parking lots is shown in ***Figure 10***. Parking Lot 12, which will be utilized as the Project's staging area, contains approximately 260 parking spaces. Also, as previously noted, in addition to the temporary prohibition of parking during construction in Lot 12, shoulder parking on PCH adjacent to Lot 12 for approximately 42 vehicles will be temporarily removed to accommodate the proposed temporary traffic improvements associated with facilitating Project-related construction vehicles in and out of the staging area.

Parking Utilization and Demand

Daily parking counts (i.e., ticket sales) were obtained from the County of Los Angeles Department of Beaches and Harbors from September 2012 through May 2013 and can be found in ***Appendix Table D-1***. The parking utilization[2] during the non-summer months is shown in ***Appendix Table D-2*** and ***Appendix Figure D-1.*** As shown in the tables and figure, the number of cars counted (ticket sales) exceeds the number of spaces available on only three occasions which correspond to two major holiday weekends (e.g., Labor Day Weekend and Memorial Day Weekend). During the rest of the non-summer months, the parking supply exceeds parking ticket sales an average of 1,587 parking spaces.

Table 6 below provides a summary of the highest monthly parking utilization recorded at the County's Zuma Beach parking lots during the September 2012 – May 2013 period (excluding Labor Day Weekend and Memorial Day Weekend as Project construction will not overlap with these periods). Also shown in *Table 6* is the available surplus parking supply during these non-summer months.

[2] The use of the County's Zuma Beach ticket sale data for parking utilization estimates is highly conservative ("worst case") as it assumes all vehicles paying for parking in a single day are on-site simultaneously. In reality, there is some turnover and some visitors arrive later in the day after other vehicles have left the County parking lot.

Table 6 ZUMA BEACH PARKING LOT UTILIZATION		
Month	**Highest Parking Utilization [a]**	**Available Surplus Parking Supply [b]**
September	1560	205
October	341	1424
November	1406	359
December	1312	453
January	327	1438
February	597	1168
March	1047	718
April	648	1117
May	954	811
[a] Based on parking lot ticket sales; Excludes Labor Day Weekend and Memorial Day Weekend as Project construction will not occur during these periods. [b] Based on an available supply of 1,765 spaces within the County's Zuma Beach parking lots excluding Lot 12.		

As shown in *Table 6*, there will be a surplus of parking, even considering the temporary loss of the Lot 12 parking spaces during non-summer months to accommodate construction of the Project. Additionally, should motorists who may otherwise park on the shoulder of PCH adjacent to Lot 12 choose to park at the County Zuma Beach parking lots, the temporary loss of approximately 42 on-street parking spaces can readily be accommodated based on the substantial parking surplus within the County lot during the construction period.

Summary

The traffic and parking assessment was conducted for the proposed Broad Beach Restoration Project located in the City of Malibu. The Project entails the hauling of sand to Broad Beach from an off-site quarry in order to restore the beach and protect it from further erosion. The traffic and parking assessment yields the following results:

- The Project is expected to generate 1350 PCE (passenger car equivalent vehicle) trips per day (675 inbound trips and 675 outbound trips) during the hauling period of the project. Also, the weekday AM peak hour it is estimated

that 135 PCE vehicle trips (75 inbound trips and 60 outbound trips) would be generated and 135 PCE vehicle trips (60 inbound trips and 75 outbound trips) during the PM peak hour. The traffic impacts of the construction operations produce less than significant impacts on the study intersections based on the City of Malibu thresholds.

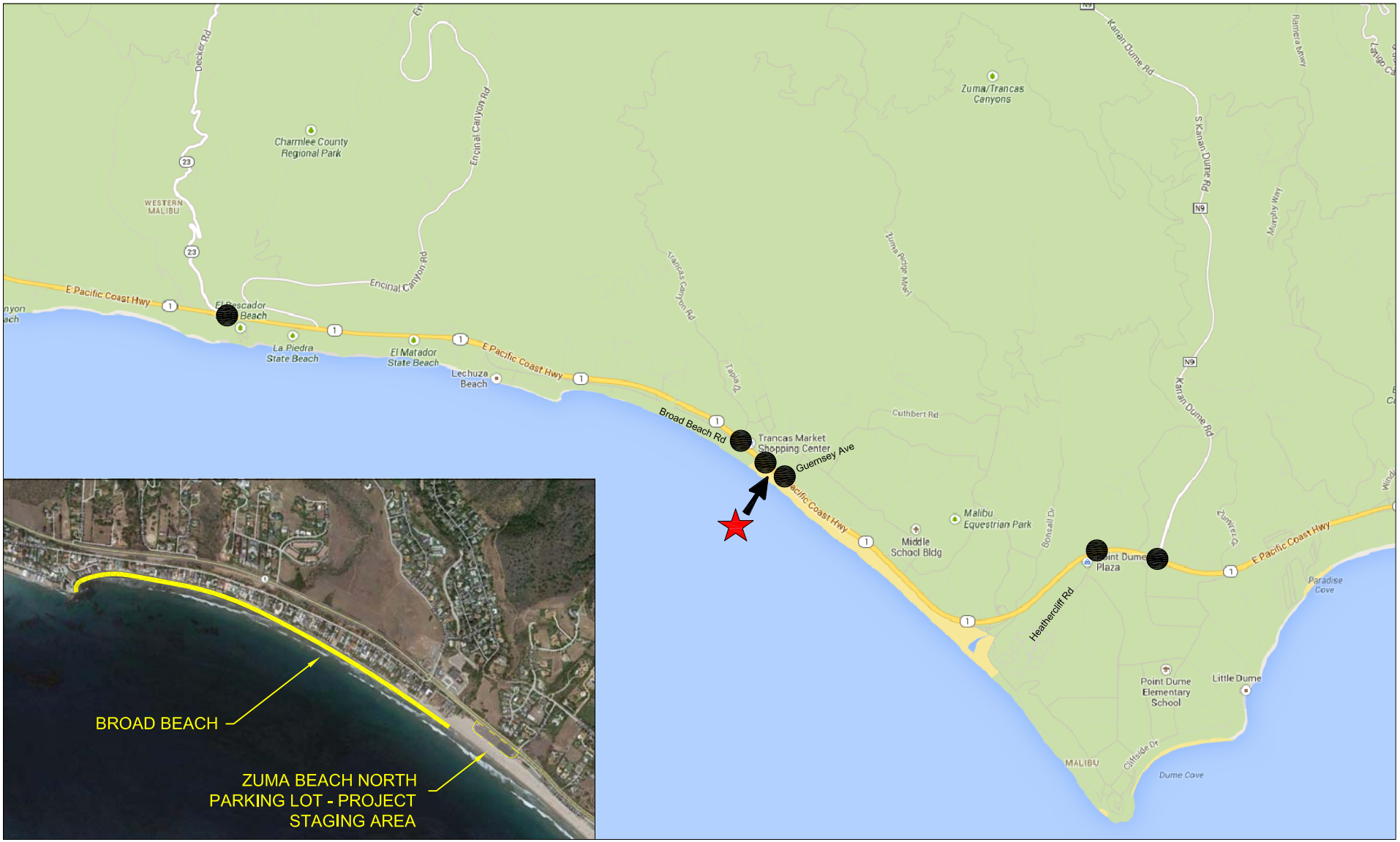
- Queuing for traffic within the Project staging area is nominal at the outbound PCH driveway. Proposed traffic signal and construction operations are not expected to be impacted.

- The Project added traffic volumes will result in less than significant traffic impacts at street segments along Pacific Coast Highway closest to the site and roadways beyond the study area.

- The Project will result in the temporary loss of the 260 public parking spaces located in Lot 12 of the County's Zuma Beach parking lot, which has an overall supply of 2,025 parking spaces. In addition, shoulder parking on PCH for approximately 42 vehicles adjacent to Lot 12 will be prohibited during the construction period. The unaffected parking supply at the Zuma County Beach will be adequate during the construction of the Project to accommodate any vehicles who utilize Lot 12 or the shoulder parking affected by the Project.

Please feel free to call us with any questions or comments regarding this traffic and parking assessment for the proposed Broad Beach Restoration Project.

cc: Chris Webb, Moffatt & Nichol
File



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NOT TO SCALE

MAP SOURCE: GOOGLE MAPS

PROJECT STAGING AREA

STUDY INTERSECTIONS

FIGURE 1
VICINITY MAP

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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MAP SOURCE: GOOGLE EARTH

FIGURE 2

PROJECT STAGING AREA AND PROPOSED DRIVEWAY LOCATIONS

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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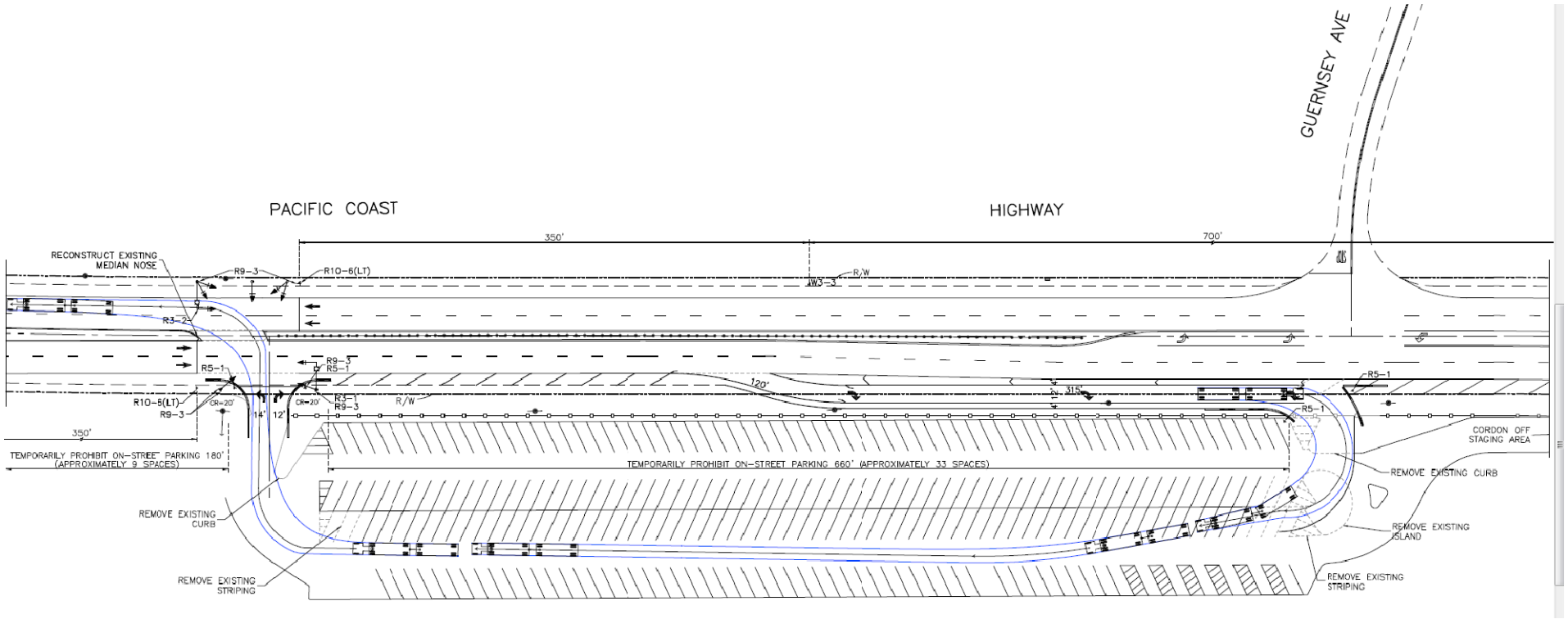

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SOURCE: LINSCOTT, LAW & GREENSPAN, engineers

FIGURE 3
PROJECT SITE CIRCULATION PLAN

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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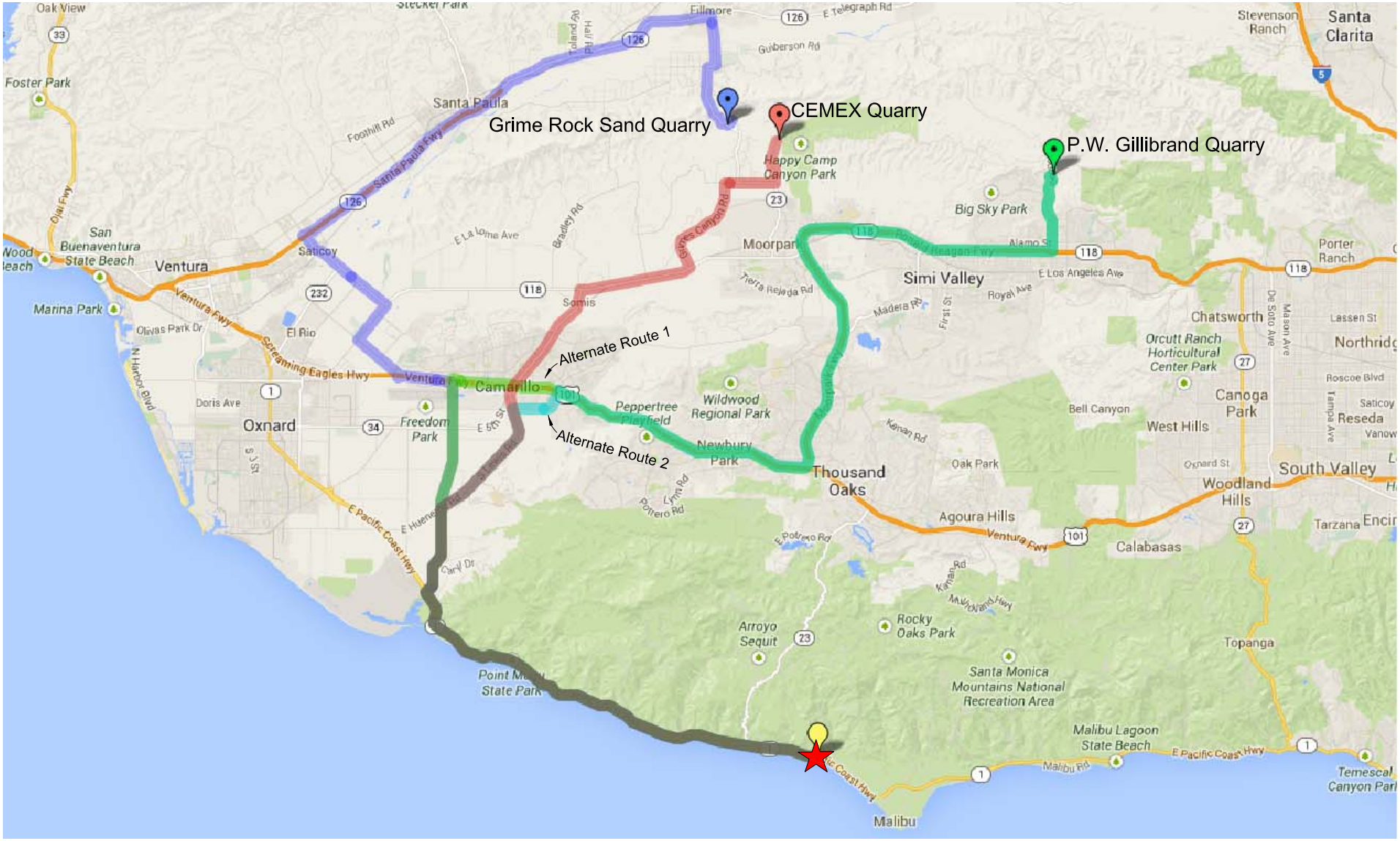

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MAP SOURCE: GOOGLE MAPS

★ PROJECT STAGING AREA

FIGURE 4
TRUCK HAUL ROUTES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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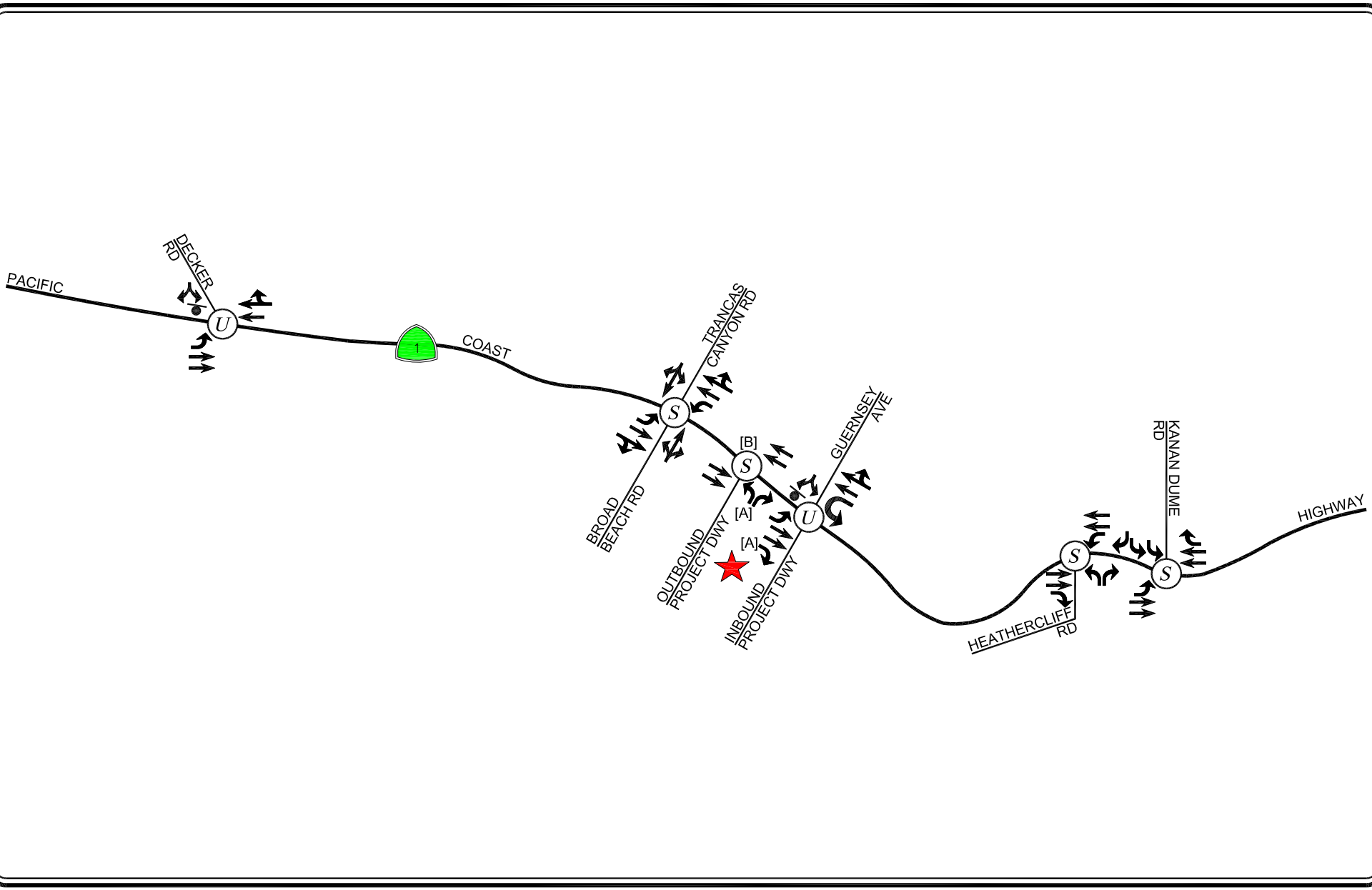

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PROJECT STAGING AREA

[A] = PROJECT MOVEMENT ONLY

[B] = TEMPORARY PROJECT TRAFFIC SIGNAL

U = UNSIGNALIZED INTERSECTION

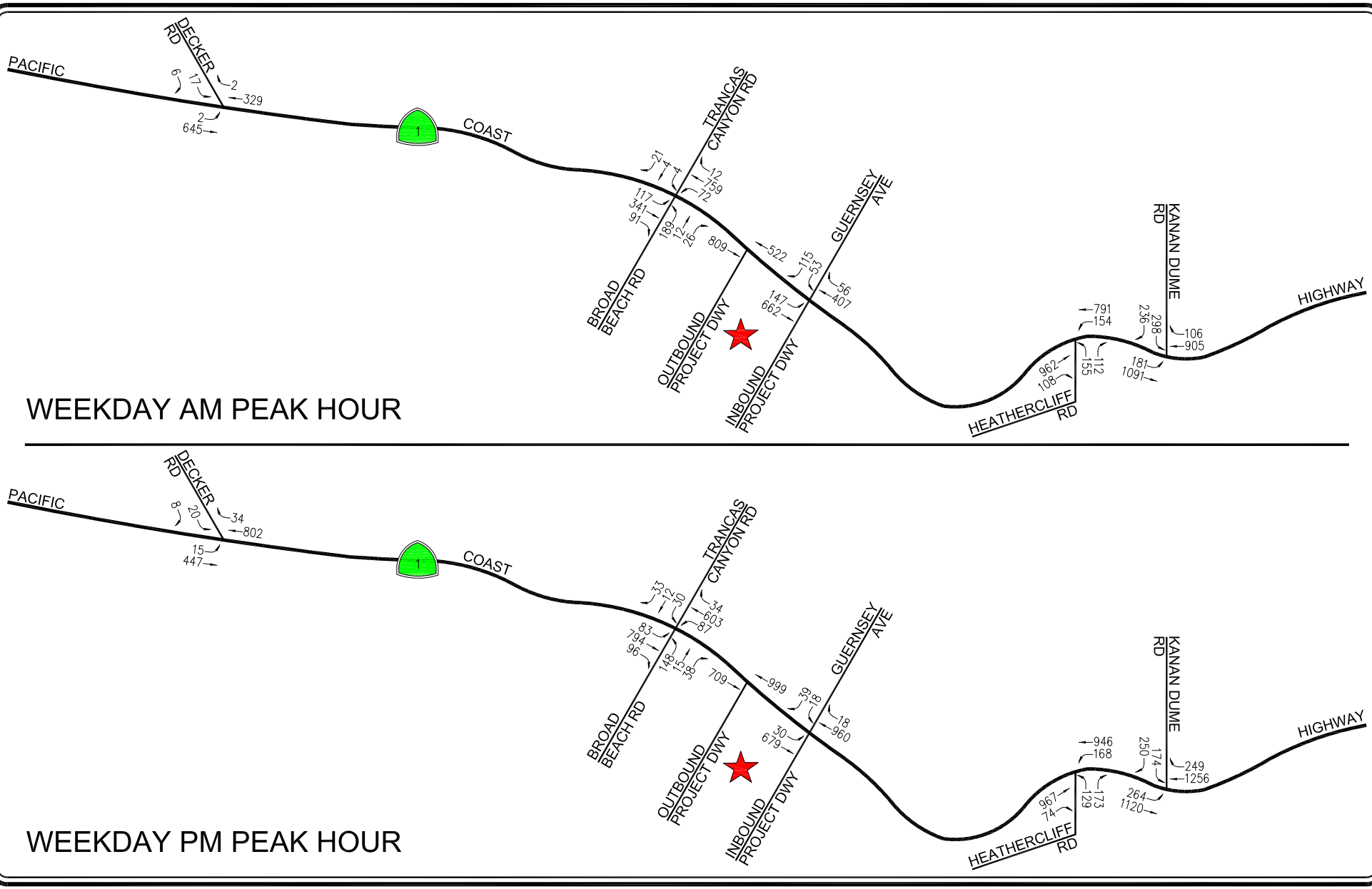
= STOP SIGN

S = SIGNALIZED INTERSECTION

FIGURE 5
LANE CONFIGURATIONS

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT



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PROJECT STAGING AREA

FIGURE 6
EXISTING TRAFFIC VOLUMES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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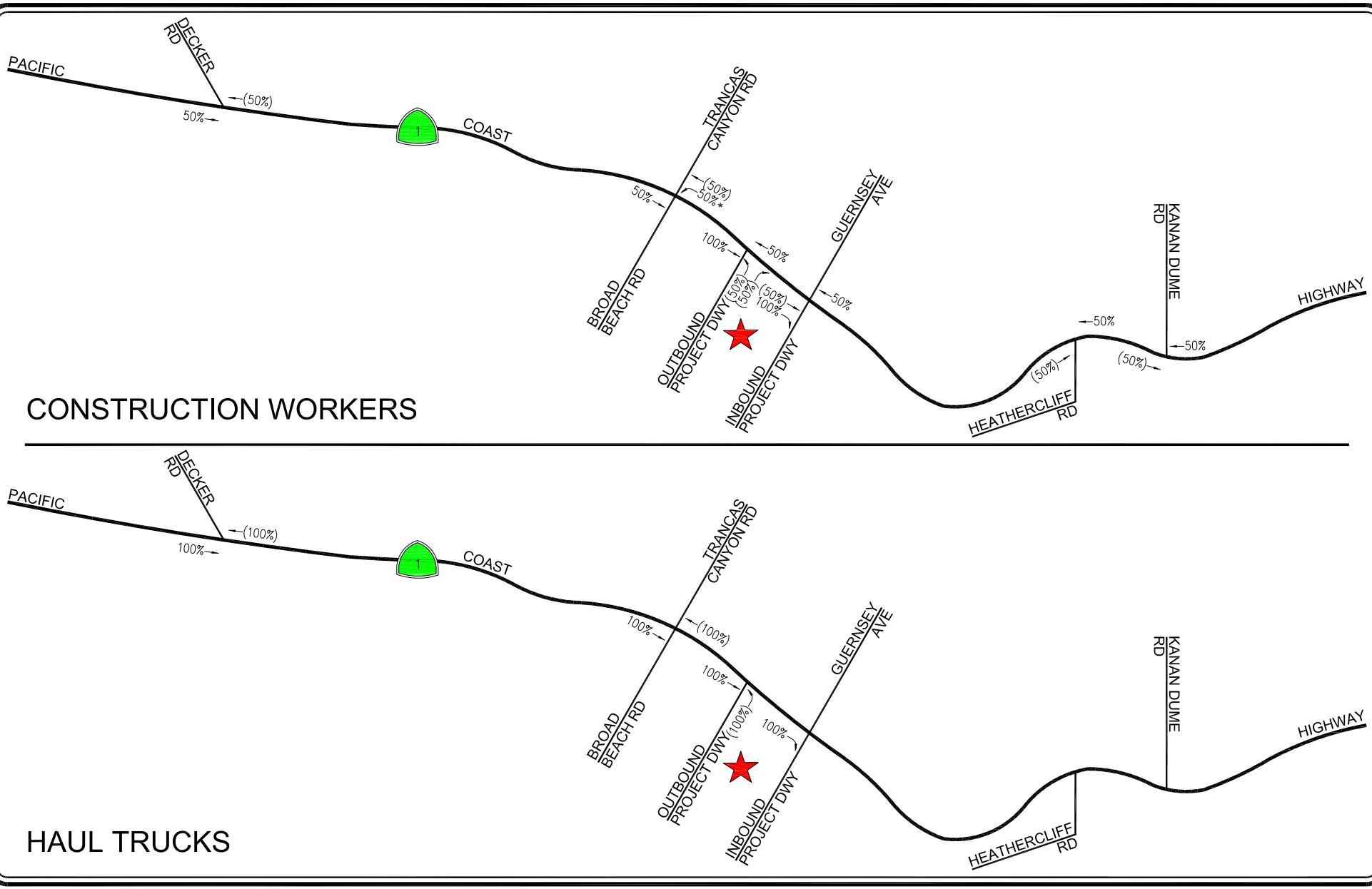


N

NOT TO SCALE

★ PROJECT STAGING AREA

XX = INBOUND PERCENTAGES

(XX) = OUTBOUND PERCENTAGES

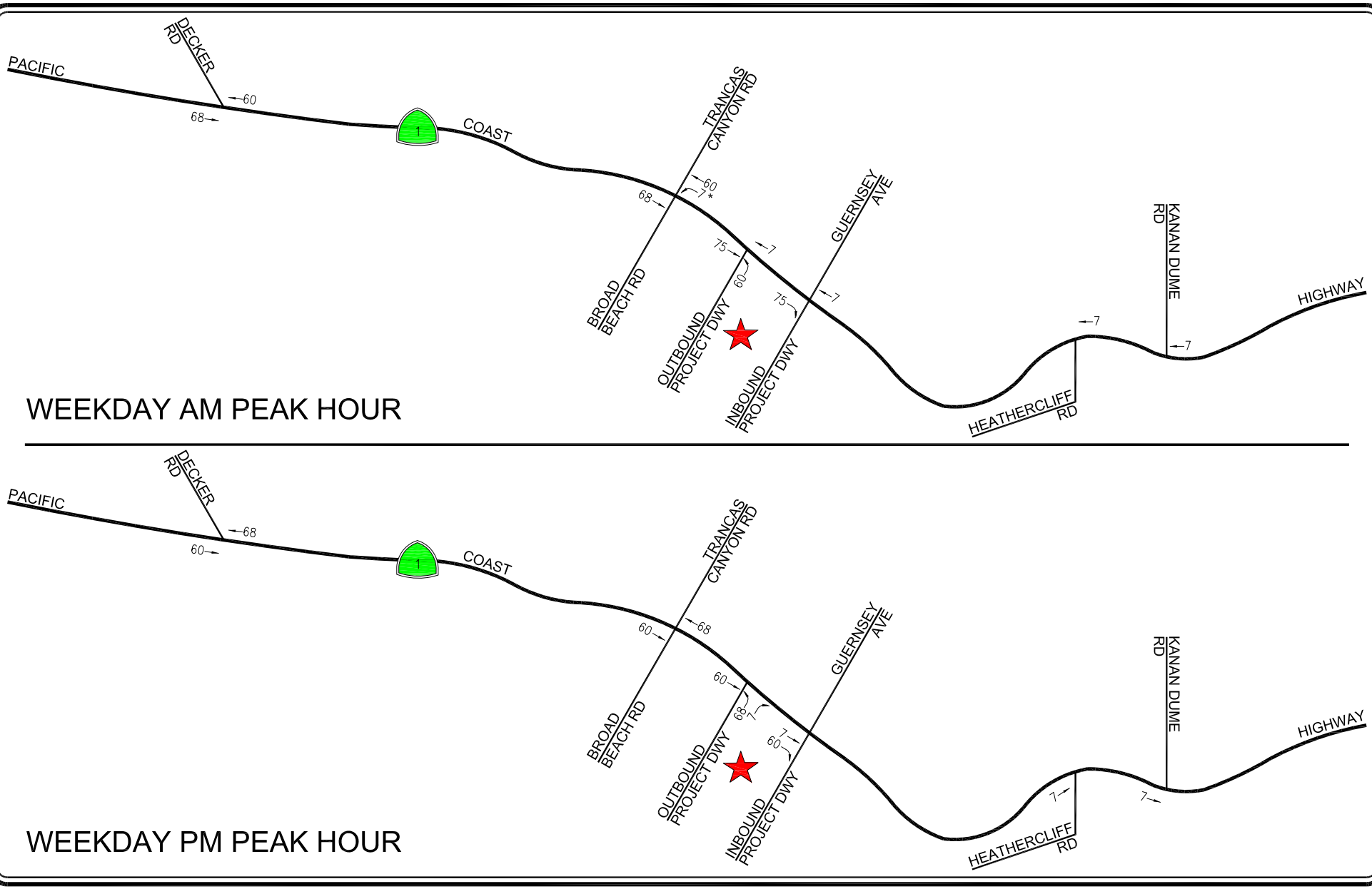
* = PROJECT U-TURN TRAFFIC

FIGURE 7
PROJECT TRIP DISTRIBUTION

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

c:\0064\dwg\f7.dwg 09/26/2013 17:58:38 nguyen llg exhibits color.ctb



N

NOT TO SCALE

NOTE: PROJECT TRUCK TRIPS EXPRESSED IN PASSENGER CAR EQUIVALENTS

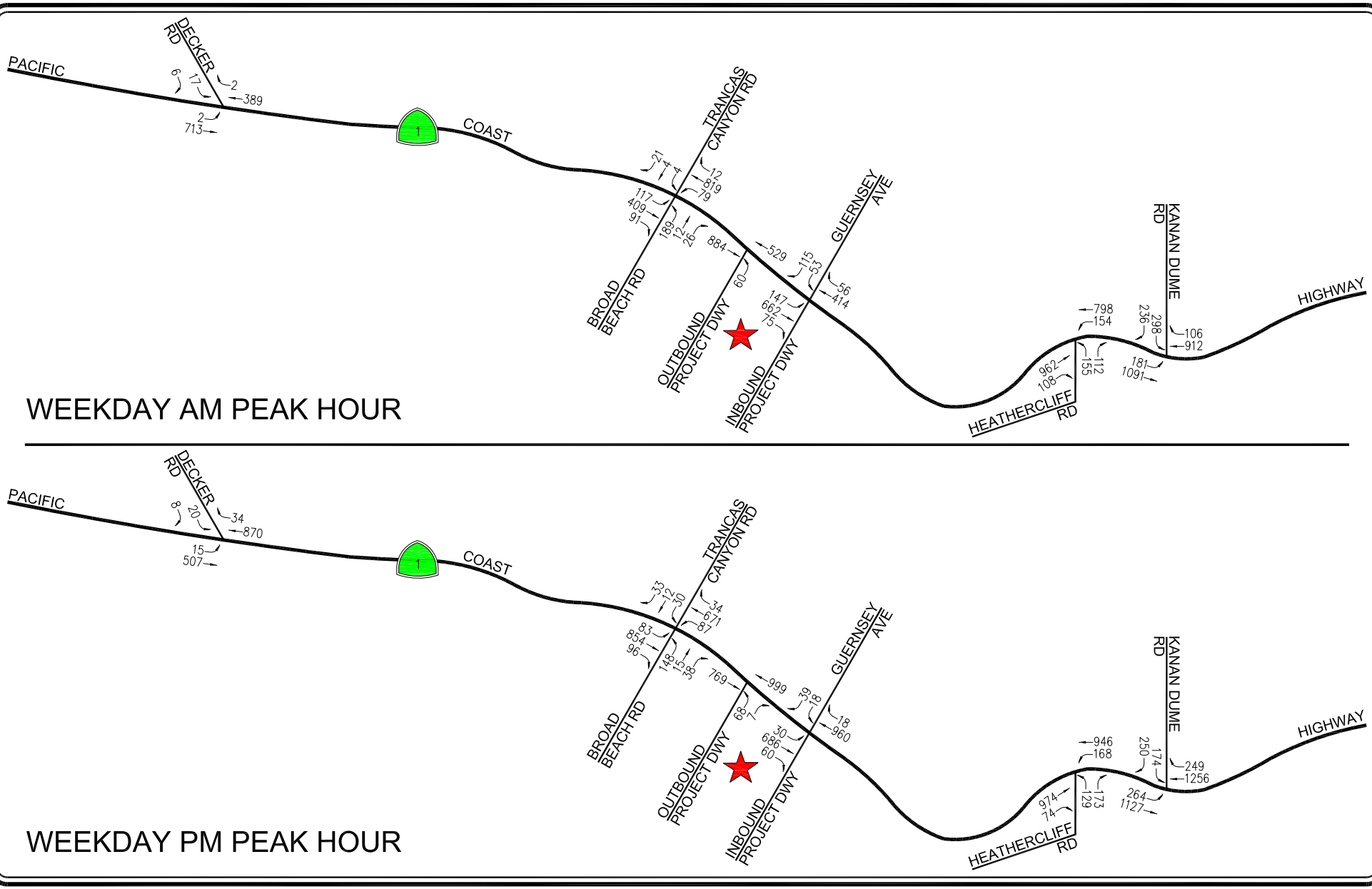
PROJECT STAGING AREA

* = PROJECT U-TURN TRAFFIC

FIGURE 8
PROJECT ONLY TRAFFIC VOLUMES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT



NOT TO SCALE

NOTE: PROJECT TRUCK TRIPS EXPRESSED IN PASSENGER CAR EQUIVALENTS

PROJECT STAGING AREA

FIGURE 9
EXISTING WITH PROJECT TRAFFIC VOLUMES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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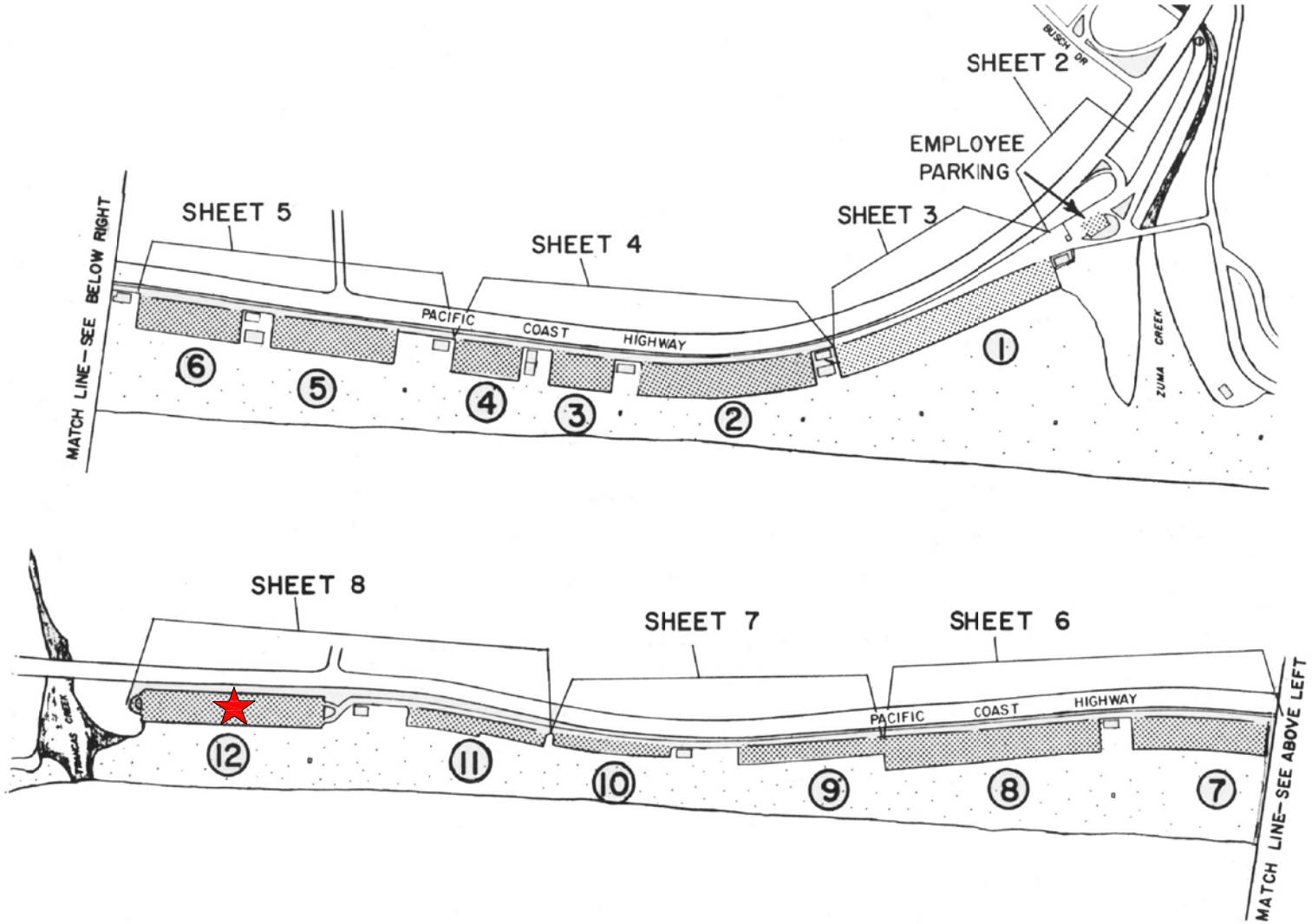


L.A. COUNTY DEPARTMENT OF BEACHES AND HARBORS Revised 5 / 2002 by CLS

N

NOT TO SCALE

MAP SOURCE: COUNTY OF LOS ANGELES DEPARTMENT OF BEACHES AND HARBORS

★ PROJECT STAGING AREA

FIGURE 10
ZUMA COUNTY BEACH PARKING

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

c:\0064\dwg\f10.dwg 09/25/2013 14:27:49 nguyen llg exhibits color.ctb

Table 1
PROJECT TRIP GENERATION [1]

10-Oct-13

LAND USE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Proposed Project							
Construction Workers [3]	30	15	0	15	0	15	15
Total Haul Trucks							
6-Axle (2.0 PCE) [4]	1,320	60	60	120	60	60	120
NET INCREASE	**1,350**	**75**	**60**	**135**	**60**	**75**	**135**

[1] Source: Moffatt & Nichol.
[2] Trips are one-way traffic movements, entering or leaving
[3] Of the peak daily trip generation associated with construction workers, it is conservatively estimated that all morning construction worker trips would occur during the weekday AM peak hour and all evening construction worker trips would occur during the weekday PM peak hour.
[4] A Passenger Car Equivalent (PCE) factor of 2.0 was applied to all trucks based on standard traffic engineering practice to conservatively estimate the equivalent number of vehicles associated with the trucks

Table 2
SUMMARY OF VOLUME TO CAPACITY RATIOS, DELAYS, AND LEVELS OF SERVICE [a]
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	PEAK HOUR	[2] EXISTING YEAR 2014 DELAY OR V/C [b]	LOS	[3] EXISTING YEAR 2014 W/ PROJECT DELAY OR V/C [b]	LOS	CHANGE V/C [(3)-(2)] [c][d]	SIGNIF. IMPACT
1	Decker Road / Pacific Coast Highway	AM	13.1	B	14.3	B	2	NO
		PM	20.1	C	22.9	C	3	NO
2	Trancas Canyon Road - Broad Beach Road / Pacific Coast Highway	AM	0.508	A	0.527	A	0.019	NO
		PM	0.527	A	0.546	A	0.019	NO
3	Outbound Project Driveway / Pacific Coast Highway [e]	AM	-	-	0.364	A	-	-
		PM	-	-	0.405	A	-	-
4	Guernsey Avenue - Inbound Project Driveway / Pacific Coast Highway	AM	20.6	C	20.8	C	1	NO
		PM	21.6	C	21.6	C	0	NO
5	Heathercliff Road / Pacific Coast Highway	AM	0.544	A	0.544	A	0.000	NO
		PM	0.565	A	0.568	A	0.003	NO
6	Kanan Dume Road / Pacific Coast Highway	AM	0.813	D	0.815	D	0.002	NO
		PM	0.950	E	0.950	E	0.000	NO

[a] Intersection analysis based on the Intersection Capacity Utilization method for signalized intersections and the Highway Capacity Manual 2000 methodology for unsignalized intersections.

[b] Delay reported in seconds per vehicle.

[c] City of Malibu signalized intersection impact threshold criteria is as follows:

Pre-Project v/c	LOS	Project-Related Increase in V/C
0.71 - 0.80	C	equal to or greater than 0.040
0.81 - 0.90	D	equal to or greater than 0.020
0.91 or more	E / F	equal to or greater than 0.010

[d] City of Malibu unsignalized intersection impact threshold criteria is as follows:

Project Related Increase in delay
5 or more seconds
Final LOS
Degrades to level D or worse

[e] Intersection Outbound Project Driveway/Pacific Coast Highway does not exist in Existing Year 2014

APPENDIX A

TRAFFIC COUNT DATA

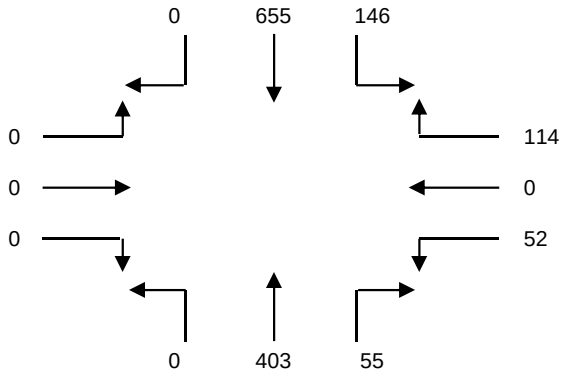
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - WOODLAND HILLS
PROJECT: BROAD BEACH - CITY OF MALIBU
DATE: TUESDAY, AUGUST 27, 2013
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION N/S PACIFIC COAST HIGHWAY
E/W GUERNSEY AVENUE
FILE NUMBER: 1-AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0700-0715	0	133	9	2	0	4	2	99	0	0	0	0
0715-0730	0	177	9	5	0	2	1	81	0	0	0	0
0730-0745	0	153	13	13	0	2	1	85	0	0	0	0
0745-0800	0	171	66	27	0	4	14	87	0	0	0	0
0800-0815	0	161	49	47	0	27	25	105	0	0	0	0
0815-0830	0	185	21	23	0	13	10	110	0	0	0	0
0830-0845	0	138	10	17	0	8	6	101	0	0	0	0
0845-0900	0	132	6	7	0	5	4	89	0	0	0	0

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0700-0800	0	634	97	47	0	12	18	352	0	0	0	0	1160
0715-0815	0	662	137	92	0	35	41	358	0	0	0	0	1325
0730-0830	0	670	149	110	0	46	50	387	0	0	0	0	1412
0745-0845	0	655	146	114	0	52	55	403	0	0	0	0	1425
0800-0900	0	616	86	94	0	53	45	405	0	0	0	0	1299

A.M. PEAK HOUR
0745-0845



PACIFIC COAST HIGHWAY

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.448.7978 PHONE
626.448.2877 FAX

City Traffic Counters
(626) 256-4171

File Name : Decker1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 1

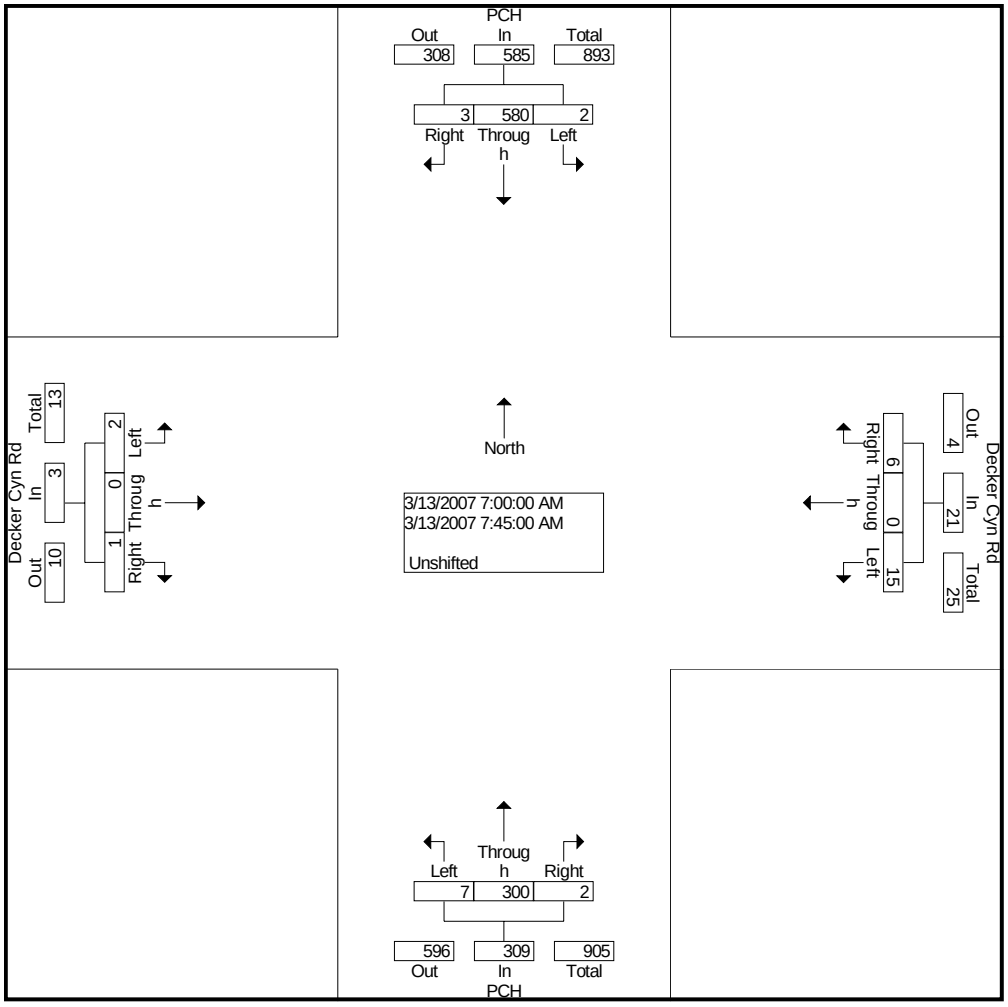
Groups Printed- Unshifted

	PCH Southbound			Decker Cyn Rd Westbound			PCH Northbound			Decker Cyn Rd Eastbound			
Start Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	155	0	1	0	1	0	71	0	0	0	0	228
07:15 AM	2	151	0	2	0	1	0	67	0	0	0	0	223
07:30 AM	0	134	1	8	0	3	4	101	2	0	0	0	253
07:45 AM	0	140	2	4	0	1	3	61	0	2	0	1	214
Total	2	580	3	15	0	6	7	300	2	2	0	1	918
08:00 AM	0	138	1	11	0	6	1	60	1	3	0	1	222
08:15 AM	0	138	1	2	0	0	1	66	0	0	0	1	209
08:30 AM	0	106	0	3	0	2	2	66	1	1	0	2	183
08:45 AM	2	116	2	7	0	4	1	70	4	1	0	1	208
Total	2	498	4	23	0	12	5	262	6	5	0	5	822
04:00 PM	2	87	0	4	0	4	0	170	4	0	0	1	272
04:15 PM	7	92	0	1	0	2	0	171	8	0	0	0	281
04:30 PM	2	108	0	9	0	2	0	191	6	1	0	0	319
04:45 PM	3	80	0	9	0	3	0	153	11	0	0	0	259
Total	14	367	0	23	0	11	0	685	29	1	0	1	1131
05:00 PM	2	103	0	5	0	0	0	158	3	0	0	0	271
05:15 PM	5	95	0	6	0	3	0	188	12	0	0	0	309
05:30 PM	2	95	0	3	0	4	0	199	4	0	0	0	307
05:45 PM	5	99	0	3	0	1	0	161	11	0	0	0	280
Total	14	392	0	17	0	8	0	706	30	0	0	0	1167
Grand Total	32	1837	7	78	0	37	12	1953	67	8	0	7	4038
Apprch %	1.7	97.9	0.4	67.8	0.0	32.2	0.6	96.1	3.3	53.3	0.0	46.7	
Total %	0.8	45.5	0.2	1.9	0.0	0.9	0.3	48.4	1.7	0.2	0.0	0.2	

City Traffic Counters
(626) 256-4171

File Name : Decker1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 2

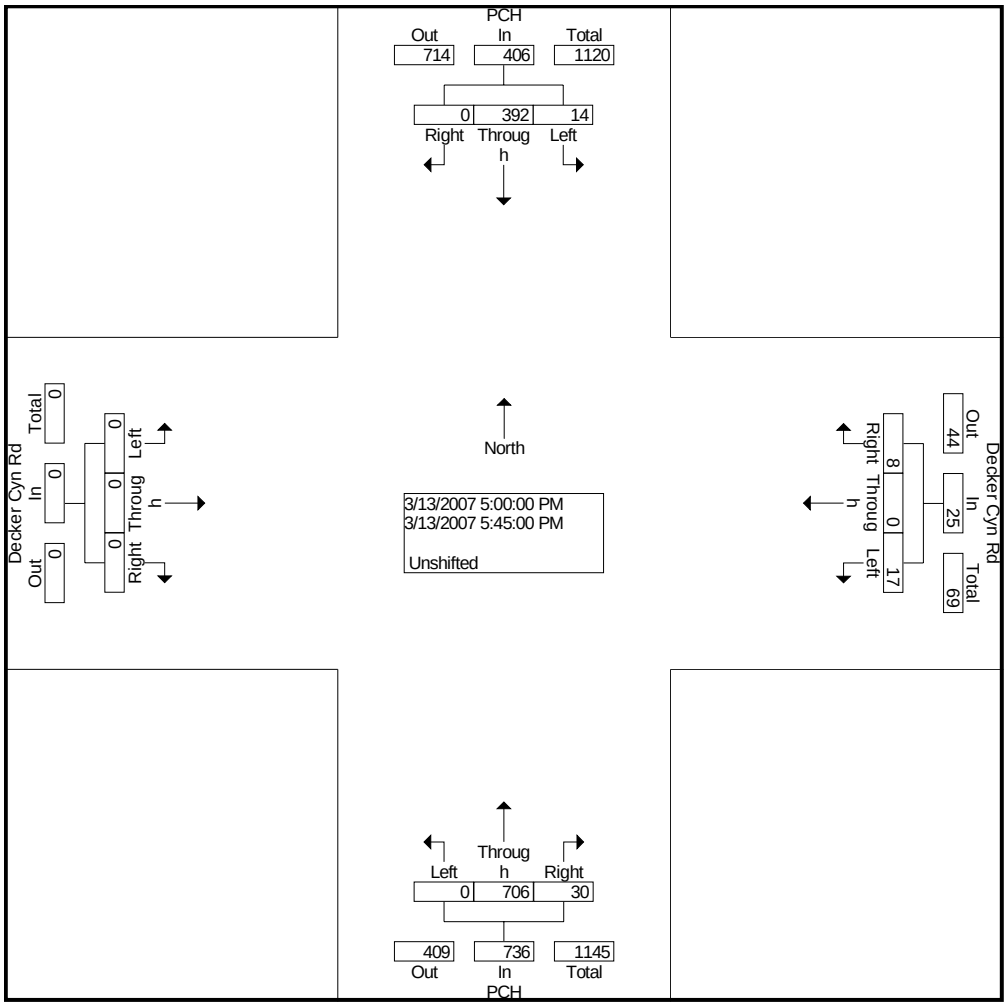
	PCH Southbound				Decker Cyn Rd Westbound				PCH Northbound				Decker Cyn Rd Eastbound				
Start Time	Left	Through	Right	App. Total	Left	Through	Right	App. Total	Left	Through	Right	App. Total	Left	Through	Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:00 AM																
Volume	2	580	3	585	15	0	6	21	7	300	2	309	2	0	1	3	918
Percent	0.3	99.1	0.5		71.4	0.0	28.6		2.3	97.1	0.6		66.7	0.0	33.3		
07:30 Volume	0	134	1	135	8	0	3	11	4	101	2	107	0	0	0	0	253
Peak Factor																	0.907
High Int.	07:00 AM				07:30 AM				07:30 AM				07:45 AM				
Volume	0	155	0	155	8	0	3	11	4	101	2	107	2	0	1	3	
Peak Factor				0.944				0.477				0.722				0.250	



City Traffic Counters
(626) 256-4171

File Name : Decker1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 3

	PCH Southbound				Decker Cyn Rd Westbound				PCH Northbound				Decker Cyn Rd Eastbound				
Start Time	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	14	392	0	406	17	0	8	25	0	706	30	736	0	0	0	0	1167
Percent	3.4	96.6	0.0		68.0	0.0	32.0		0.0	95.9	4.1		0.0	0.0	0.0		
05:15 Volume	5	95	0	100	6	0	3	9	0	188	12	200	0	0	0	0	309
Peak Factor																	0.944
High Int.	05:00 PM				05:15 PM				05:30 PM								
Volume	2	103	0	105	6	0	3	9	0	199	4	203					
Peak Factor				0.967				0.694				0.906					



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Trancas Canyon Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	2	1	1	2	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	14	0	5	1	1	3	19	54	16	17	135	1	266
7:15 AM	20	3	13	0	0	1	20	73	16	18	163	0	327
7:30 AM	28	2	2	0	2	2	23	65	17	12	190	0	343
7:45 AM	65	1	3	0	0	5	31	97	27	14	195	0	438
8:00 AM	62	5	6	0	2	10	25	69	24	19	151	1	374
8:15 AM	48	7	7	1	1	5	26	88	13	16	103	1	316
8:30 AM	40	2	3	1	2	6	31	93	19	14	124	1	336
8:45 AM	43	5	2	0	2	2	28	94	14	16	140	1	347
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													
TOTAL VOLUMES =	NL 320	NT 25	NR 41	SL 3	ST 10	SR 34	EL 203	ET 633	ER 146	WL 126	WT 1201	WR 5	TOTAL 2747

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	175	11	24	0	4	18	99	304	84	63	699	1	1482
PEAK HR. FACTOR:		0.719			0.458			0.785			0.913		0.846

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Trancas Canyon Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	2	1	1	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	35	1	12	0	0	9	13	108	23	11	123	3	338
4:15 PM	39	5	14	3	3	7	9	173	16	13	144	1	427
4:30 PM	22	2	8	5	7	7	16	204	13	13	171	7	475
4:45 PM	40	5	6	3	1	4	16	157	30	15	106	0	383
5:00 PM	36	2	7	1	0	5	14	194	29	19	101	0	408
5:15 PM	34	1	15	0	2	4	10	193	25	16	106	0	406
5:30 PM	46	2	11	0	2	7	18	181	26	18	114	2	427
5:45 PM	45	5	8	0	0	4	20	167	27	18	81	1	376
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	297	23	81	12	15	47	116	1377	189	123	946	14	3240

PM Peak Hr Begins at: 415 PM

PEAK VOLUMES =	137	14	35	12	11	23	55	728	88	60	522	8	1693
PEAK HR. FACTOR:		0.802			0.605			0.919			0.772		0.891

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Heathercliff Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0	1					2	1	1	2		
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	9		28					181	14	28	129		389
7:15 AM	26		19					187	12	30	162		436
7:30 AM	49		29					201	15	31	253		578
7:45 AM	45		21					208	54	42	177		547
8:00 AM	24		35					280	19	40	111		509
8:15 AM	19		26					182	12	48	105		392
8:30 AM	36		45					159	18	32	128		418
8:45 AM	31		24					225	18	52	159		509
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	239	0	227	0	0	0	0	1623	162	303	1224	0	3778

AM Peak Hr Begins at: 715 AM

PEAK													
VOLUMES =	144	0	104	0	0	0	0	876	100	143	703	0	2070
PEAK HR. FACTOR:		0.795			0.000			0.816			0.745		0.895

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Heathercliff Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0	1					2	1	1	2		
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	35		50					233	12	39	189		558
4:15 PM	27		33					231	18	53	250		612
4:30 PM	31		38					150	33	41	201		494
4:45 PM	26		39					202	5	22	177		471
5:00 PM	31		47					201	20	41	176		516
5:15 PM	34		49					186	19	39	156		483
5:30 PM	26		48					99	12	45	135		365
5:45 PM	22		42					124	9	29	134		360
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	232	0	346	0	0	0	0	1426	128	309	1418	0	3859

PM Peak Hr Begins at: 400 PM

PEAK VOLUMES =	119	0	160	0	0	0	0	816	68	155	817	0	2135
PEAK HR. FACTOR:		0.821			0.000			0.888			0.802		0.872

CONTROL: Signalized

City Traffic Counters
(626) 256-4171

File Name : Kanan1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 1

Groups Printed- 1 - Unshifted

	PCH Southbound			Kanan Dume Rd Westbound			PCH Northbound			Kanan Dume Rd Eastbound			
Start Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	21	201	0	40	0	55	0	130	14	0	0	0	461
07:15 AM	28	199	0	48	0	40	0	176	21	0	0	0	512
07:30 AM	26	229	0	63	2	75	0	254	19	0	0	0	668
07:45 AM	40	265	0	59	0	62	0	211	20	0	0	0	657
Total	115	894	0	210	2	232	0	771	74	0	0	0	2298
08:00 AM	64	267	0	40	0	67	0	164	26	0	0	0	628
08:15 AM	35	240	0	56	2	63	0	175	33	0	0	0	604
08:30 AM	44	207	0	56	0	52	0	134	43	0	0	0	536
08:45 AM	37	217	0	51	0	61	0	177	26	0	0	0	569
Total	180	931	0	203	2	243	0	650	128	0	0	0	2337
04:00 PM	67	238	1	44	0	47	0	278	62	0	0	0	737
04:15 PM	56	229	0	38	0	70	0	267	48	0	0	0	708
04:30 PM	65	235	0	46	0	41	0	276	58	0	0	0	721
04:45 PM	57	223	1	37	0	55	0	273	49	0	0	0	695
Total	245	925	2	165	0	213	0	1094	217	0	0	0	2861
05:00 PM	50	249	2	33	0	51	0	278	62	0	0	0	725
05:15 PM	52	258	0	45	2	72	0	290	61	0	0	0	780
05:30 PM	75	242	0	38	0	58	0	255	39	0	0	0	707
05:45 PM	51	223	0	45	0	53	0	237	55	0	0	0	664
Total	228	972	2	161	2	234	0	1060	217	0	0	0	2876
Grand Total	768	3722	4	739	6	922	0	3575	636	0	0	0	10372
Apprch %	17.1	82.8	0.1	44.3	0.4	55.3	0.0	84.9	15.1	0.0	0.0	0.0	
Total %	7.4	35.9	0.0	7.1	0.1	8.9	0.0	34.5	6.1	0.0	0.0	0.0	

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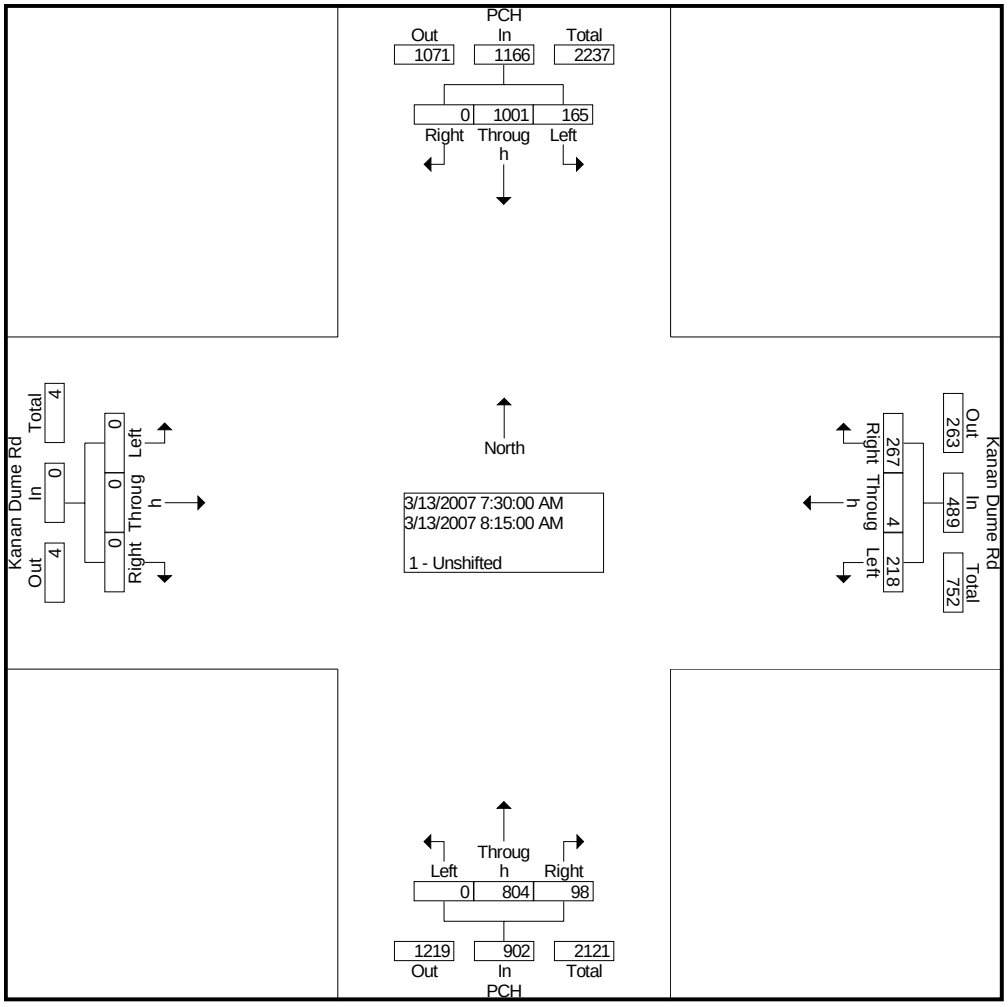
File Name : Kanan1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 2

	PCH Southbound				Kanan Dume Rd Westbound				PCH Northbound				Kanan Dume Rd Eastbound				
Start Time	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:30 AM																
Volume	165	1001	0	1166	218	4	267	489	0	804	98	902	0	0	0	0	2557
Percent	14.2	85.8	0.0		44.6	0.8	54.6		0.0	89.1	10.9		0.0	0.0	0.0		
07:30 Volume	26	229	0	255	63	2	75	140	0	254	19	273	0	0	0	0	668
Peak Factor																	0.957
High Int.	08:00 AM				07:30 AM				07:30 AM				6:45:00 AM				
Volume	64	267	0	331	63	2	75	140	0	254	19	273					
Peak Factor				0.881				0.873				0.826					



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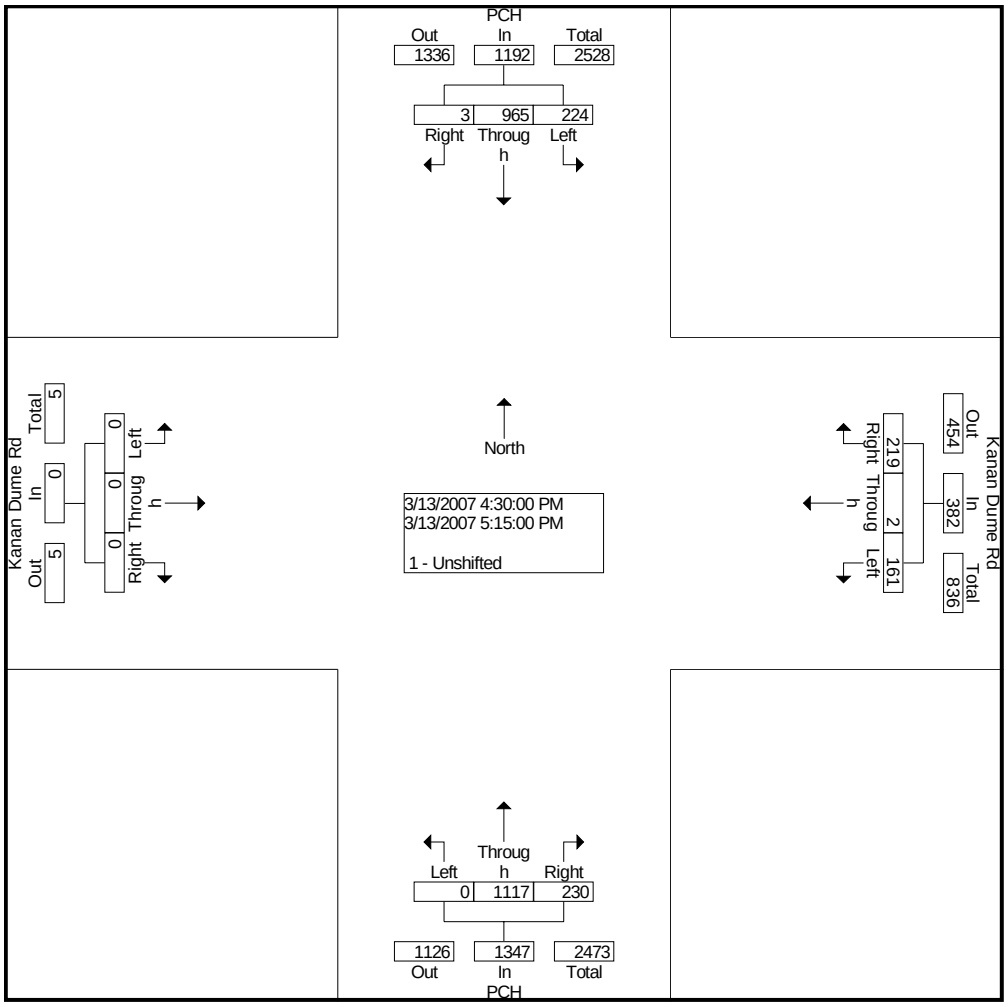
File Name : Kanan1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 3

	PCH Southbound				Kanan Dume Rd Westbound				PCH Northbound				Kanan Dume Rd Eastbound				
Start Time	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:30 PM																
Volume	224	965	3	1192	161	2	219	382	0	1117	230	1347	0	0	0	0	2921
Percent	18.8	81.0	0.3		42.1	0.5	57.3		0.0	82.9	17.1		0.0	0.0	0.0		
05:15 Volume	52	258	0	310	45	2	72	119	0	290	61	351	0	0	0	0	780
Peak Factor																	0.936
High Int.	05:15 PM				05:15 PM				05:15 PM								
Volume	52	258	0	310	45	2	72	119	0	290	61	351					
Peak Factor				0.961				0.803				0.959					



APPENDIX B

ICU AND LEVEL OF SERVICE EXPLANATION
HCM AND LEVEL OF SERVICE EXPLANATION
ICU AND HCS DATA WORKSHEETS –
WEEKDAY AM AND PM PEAK HOURS

INTERSECTION CAPACITY UTILIZATION (ICU) DESCRIPTION

Level of Service is a term used to describe prevailing conditions and their effect on traffic. Broadly interpreted, the Levels of Service concept denotes any one of a number of differing combinations of operating conditions which may occur as a roadway is accommodating various traffic volumes. Level of Service is a qualitative measure of the effect of such factors as travel speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

Six Levels of Service, A through F, have been defined in the 1965 *Highway Capacity Manual*, published by the Transportation Research Board. Level of Service A describes a condition of free flow, with low traffic volumes and relatively high speeds, while Level of Service F describes forced traffic flow at low speeds with jammed conditions and queues which cannot clear during the green phases.

The Intersection Capacity Utilization (ICU) method of intersection capacity analysis has been used in our studies. It directly relates traffic demand and available capacity for key intersection movements, regardless of present signal timing, The capacity per hour of green time for each approach is calculated based on the methods of the *Highway Capacity Manual*. The proportion of total signal time needed by each key movement is determined and compared to the total time available (100 percent of the hour). The result of summing the requirements of the conflicting key movements plus an allowance for clearance times is expressed as a decimal fraction. Conflicting key traffic movements are those opposing movements whose combined green time requirements are greatest.

The resulting ICU represents the proportion of the total hour required to accommodate intersection demand volumes if the key conflicting traffic movements are operating at capacity. Other movements may be operating near capacity, or may be operating at significantly better levels. The ICU may be translated to a Level of Service as tabulated below.

The Levels of Service (abbreviated from the *Highway Capacity Manual*) are listed here with their corresponding ICU and Load Factor equivalents. Load Factor is that proportion of the signal cycles during the peak hour which are fully loaded; i.e. when all of the vehicles waiting at the beginning of green are not able to clear on that green phase.

Intersection Capacity Utilization Characteristics

Level of Service	Load Factor	Equivalent ICU
A	0.0	0.00 - 0.60
B	0.0 - 0.1	0.61 - 0.70
C	0.1 - 0.3	0.71 - 0.80
D	0.3 - 0.7	0.81 - 0.90
E	0.7 - 1.0	0.91 - 1.00
F	Not Applicable	Not Applicable

SERVICE LEVEL A
There are no loaded cycles and few are even close to loaded at this service level. No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.

SERVICE LEVEL B
This level represents stable operation where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.

SERVICE LEVEL C
At this level stable operation continues. Loading is still intermittent but more frequent than at Level B. Occasionally drivers may have to wait through more than one red signal indication and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.

SERVICE LEVEL D
This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak hour, but enough cycles with lower demand occur to permit periodic clearance of queues, thus preventing excessive backups. Drivers frequently have to wait through more than one red signal. This level is the lower limit of acceptable operation to most drivers.

SERVICE LEVEL E
This represents near capacity and capacity operation. At capacity (ICU = 1.0) it represents the most vehicles that the particular intersection can accommodate. However, full utilization of every signal cycle is seldom attained no matter how great the demand. At this level all drivers wait through more than one red signal, and frequently through several.

SERVICE LEVEL F
Jammed conditions. Traffic backed up from a downstream location on one of the street restricts or prevents movement of traffic through the intersection under consideration.

LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

In the *Highway Capacity Manual (HCM)*, published by the Transportation Research Board, 2000, level of service for unsignalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, in the absence of incidents, control, traffic, or geometric delay. Only the portion of total delay attributed to the traffic control measures, either traffic signals or stop signs, is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Level of Service criteria for unsignalized intersections are stated in terms of the average control delay per vehicle. The level of service is determined by the computed or measured control delay and is defined for each minor movement. Average control delay for any particular minor movement is a function of the service time for the approach and the degree of utilization. (Level of service is not defined for the intersection as a whole for two-way stop controlled intersections.)

Level of Service Criteria for TWSC/AWSC Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Level of Service (LOS) values are used to describe intersection operations with service levels varying from LOS A (free flow) to LOS F (jammed condition). The following descriptions summarize *HCM* criteria for each level of service:

LOS A describes operations with very low control delay, up to 10 seconds per vehicle.

LOS B describes operations with control delay greater than 10 and up to 15 seconds per vehicle.

LOS C describes operations with control delay greater than 15 and up to 25 seconds per vehicle.

LOS D describes operations with control delay greater than 25 and up to 35 seconds per vehicle.

LOS E describes operations with control delay greater than 35 and up to 50 seconds per vehicle.

LOS F describes operations with control delay in excess of 50 seconds per vehicle. For two-way stop controlled intersections, LOS F exists when there are insufficient gaps of suitable size to allow side-street demand to safely cross through a major-street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches.

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*TTN*	Intersection	*1*
Agency/Co.	*LLG*	Jurisdiction	*Caltrans/City of Malibu*
Date Performed	*9/4/2013*	Analysis Year	*Existing*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*2*	*645*			*329*	*2*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*2*	*645*	*0*	*0*	*329*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*17*	*0*	*6*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*17*	*0*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*1*	*0*
Configuration					*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LTR*	
v (veh/h)	*2*						*23*	
C (m) (veh/h)	*1240*						*467*	
v/c	*0.00*						*0.05*	
95% queue length	*0.00*						*0.15*	
Control Delay (s/veh)	*7.9*						*13.1*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*13.1*	
Approach LOS	--	--					*B*	

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*TTN*
Agency/Co.	*LLG*
Date Performed	*9/4/2013*
Analysis Time Period	*Weekday PM Peak Hour*

Site Information

Intersection	*1*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*15*	*447*			*802*	*34*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*15*	*447*	*0*	*0*	*802*	*34*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*20*	*0*	*8*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*20*	*0*	*8*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*1*	*0*
Configuration					*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LTR*	
v (veh/h)	*15*						*28*	
C (m) (veh/h)	*807*						*263*	
v/c	*0.02*						*0.11*	
95% queue length	*0.06*						*0.35*	
Control Delay (s/veh)	*9.5*						*20.3*	
LOS	*A*						*C*	
Approach Delay (s/veh)	--	--					*20.3*	
Approach LOS	--	--					*C*	

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*TTN*
Agency/Co.	*LLG*
Date Performed	*9/26/2013*
Analysis Time Period	*Weekday AM Peak Hour*

Site Information

Intersection	*1*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing+Project*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*2*	*713*			*389*	*2*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*2*	*713*	*0*	*0*	*389*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*17*	*0*	*6*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*17*	*0*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*1*	*0*
Configuration					*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LTR*	
v (veh/h)	*2*						*23*	
C (m) (veh/h)	*1179*						*411*	
v/c	*0.00*						*0.06*	
95% queue length	*0.01*						*0.18*	
Control Delay (s/veh)	*8.1*						*14.3*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*14.3*	
Approach LOS	--	--					*B*	

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*TTN*
Agency/Co.	*LLG*
Date Performed	*9/12/2013*
Analysis Time Period	*Weekday PM Peak Hour*

Site Information

Intersection	*1*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing+Project*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*15*	*507*			*870*	*34*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*15*	*507*	*0*	*0*	*870*	*34*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*20*	*0*	*8*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*20*	*0*	*8*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*1*	*0*
Configuration					*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LTR*	
v (veh/h)	*15*						*28*	
C (m) (veh/h)	*761*						*229*	
v/c	*0.02*						*0.12*	
95% queue length	*0.06*						*0.41*	
Control Delay (s/veh)	*9.8*						*22.9*	
LOS	*A*						*C*	
Approach Delay (s/veh)	--	--				*22.9*		
Approach LOS	--	--				*C*		

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INTERSECTION CAPACITY UTILIZATION

Trancas Canyon Road-Broad Beach Road @ Pacific Coast Highway

N-S St: Trancas Canyon Road-Broad Beach Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU2

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	180	0	0.113	9	189	0.118	0	189	0	0.118	0	189	0	0.118	0	189	0	0.118	0	189	0	0.118
Nb Thru	11	1600	0.135 *	1	12	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *
Nb Right	25	0	-	1	26	-	0	26	0	-	0	26	0	-	0	26	0	-	0	26	0	-
Sb Left	4	0	0.003 *	0	4	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *
Sb Thru	4	1600	0.018	0	4	0.018	0	4	1600	0.018	0	4	1600	0.018	0	4	1600	0.018	0	4	1600	0.018
Sb Right	20	0	-	1	21	-	0	21	0	-	0	21	0	-	0	21	0	-	0	21	0	-
Eb Left	111	1600	0.069 *	6	117	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *
Eb Thru	325	3200	0.129	16	341	0.135	68	409	3200	0.156	0	409	3200	0.156	0	409	3200	0.156	0	409	3200	0.156
Eb Right	87	0	-	4	91	-	0	91	0	-	0	91	0	-	0	91	0	-	0	91	0	-
Wb Left	69	1600	0.043	3	72	0.045	7	79	1600	0.050	0	79	1600	0.050	0	79	1600	0.050	0	79	1600	0.050
Wb Thru	723	3200	0.229 *	36	759	0.241 *	60	819	3200	0.260 *	0	819	3200	0.260 *	0	819	3200	0.260 *	0	819	3200	0.260 *
Wb Right	11	0	-	1	12	-	0	12	0	-	0	12	0	-	0	12	0	-	0	12	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.486			0.508				0.527				0.527				0.527				0.527
LOS			A			A				A				A				A				A

01:32 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Trancas Canyon Road-Broad Beach Road @ Pacific Coast Highway

N-S St: Trancas Canyon Road-Broad Beach Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU2

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	141	0	0.088	7	148	0.093	0	148	0	0.093	0	148	0	0.093	0	148	0	0.093	0	148	0	0.093
Nb Thru	14	1600	0.119 *	1	15	0.125 *	0	15	1600	0.125 *	0	15	1600	0.125 *	0	15	1600	0.125 *	0	15	1600	0.125 *
Nb Right	36	0	-	2	38	-	0	38	0	-	0	38	0	-	0	38	0	-	0	38	0	-
Sb Left	29	0	0.018 *	1	30	0.019 *	0	30	0	0.019 *	0	30	0	0.019 *	0	30	0	0.019 *	0	30	0	0.019 *
Sb Thru	11	1600	0.044	1	12	0.047	0	12	1600	0.047	0	12	1600	0.047	0	12	1600	0.047	0	12	1600	0.047
Sb Right	31	0	-	2	33	-	0	33	0	-	0	33	0	-	0	33	0	-	0	33	0	-
Eb Left	79	1600	0.049	4	83	0.052	0	83	1600	0.052	0	83	1600	0.052	0	83	1600	0.052	0	83	1600	0.052
Eb Thru	756	3200	0.265 *	38	794	0.278 *	60	854	3200	0.297 *	0	854	3200	0.297 *	0	854	3200	0.297 *	0	854	3200	0.297 *
Eb Right	91	0	-	5	96	-	0	96	0	-	0	96	0	-	0	96	0	-	0	96	0	-
Wb Left	83	1600	0.052 *	4	87	0.054 *	0	87	1600	0.054 *	0	87	1600	0.054 *	0	87	1600	0.054 *	0	87	1600	0.054 *
Wb Thru	574	3200	0.189	29	603	0.199	68	671	3200	0.220	0	671	3200	0.220	0	671	3200	0.220	0	671	3200	0.220
Wb Right	32	0	-	2	34	-	0	34	0	-	0	34	0	-	0	34	0	-	0	34	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.504			0.527				0.546				0.546				0.546				0.546
LOS			A			A				A				A				A				A

01:32 PM

* *Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Outbound Project Driveway @ Pacific Coast Highway

N-S St: Outbound Project Driveway
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU3

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2013
Projection Year: 2014

	2013 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	1600	0.000	0	0	0.000	60	60	1600	0.038	0	60	1600	0.038	0	60	1600	0.038	0	60	1600	0.038
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Sb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Eb Thru	801	3200	0.250 *	8	809	0.253 *	75	884	3200	0.276 *	0	884	3200	0.276 *	0	884	3200	0.276 *	0	884	3200	0.276 *
Eb Right	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Wb Left	0	1600	0.000 *	0	0	0.000 *	0	0	1600	0.000 *	0	0	1600	0.000 *	0	0	1600	0.000 *	0	0	1600	0.000 *
Wb Thru	517	3200	0.162	5	522	0.163	7	529	3200	0.165	0	529	3200	0.165	0	529	3200	0.165	0	529	3200	0.165
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.300			0.303				0.364				0.364				0.364				0.364
LOS			A			A				A				A				A				A

01:33 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: Extrapolated from ICU4
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Outbound Project Driveway @ Pacific Coast Highway

N-S St: Outbound Project Driveway
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU3

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2013
Projection Year: 2014

	2013 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	1600	0.000	0	0	0.000	68	68	1600	0.043	0	68	1600	0.043	0	68	1600	0.043	0	68	1600	0.043
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	1600	0.000	0	0	0.000	7	7	1600	0.004	0	7	1600	0.004	0	7	1600	0.004	0	7	1600	0.004
Sb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Eb Thru	702	3200	0.219	7	709	0.222	60	769	3200	0.240	0	769	3200	0.240	0	769	3200	0.240	0	769	3200	0.240
Eb Right	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Wb Left	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Wb Thru	989	3200	0.309 *	10	999	0.312 *	0	999	3200	0.312 *	0	999	3200	0.312 *	0	999	3200	0.312 *	0	999	3200	0.312 *
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.359			0.362				0.405				0.405				0.405				0.405
LOS			A			A				A				A				A				A

01:33 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: Extrapolated from ICU4
2 Capacity expressed in veh/hour of green

SHORT REPORT

General Information		Site Information	
Analyst	*TTN*	Intersection	*3*
Agency or Co.	*LLG*	Area Type	*All other areas*
Date Performed	*9/26/2013*	Jurisdiction	*Caltrans/City of Malibu*
Time Period		Analysis Year	

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		*2*			*2*		*1*		*1*			
Lane Group		*T*			*T*		*L*		*R*			
Volume (vph)		*884*			*529*		*60*		*0*			
% Heavy Vehicles		*0*			*0*		*0*		*0*			
PHF		*0.90*			*0.90*		*0.90*		*0.90*			
Pretimed/Actuated (P/A)		*P*			*P*		*A*		*A*			
Startup Lost Time		*2.0*			*2.0*		*2.0*		*2.0*			
Extension of Effective Green		*2.0*			*2.0*		*2.0*		*2.0*			
Arrival Type		*3*			*3*		*3*		*3*			
Unit Extension		*3.0*			*3.0*		*3.0*		*3.0*			
Ped/Bike/RTOR Volume	*0*	*0*		*0*	*0*		*0*	*0*	*0*			
Lane Width		*12.0*			*12.0*		*12.0*		*12.0*			
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*			
Parking/Hour												
Bus Stops/Hour		*0*			*0*		*0*		*0*			
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*				

Phasing	Thru Only	02	03	04	NB Only	06	07	08
Timing	G = *45.0*	G = *0.0*	G =	G =	G = *5.0*	G = *0.0*	G =	G =
	Y = *5*	Y = *0*	Y =	Y =	Y = *5*	Y = *0*	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		*982*			*588*		*67*		*0*			
Lane Group Capacity		*2714*			*2714*		*150*		*135*			
v/c Ratio		*0.36*			*0.22*		*0.45*		*0.00*			
Green Ratio		*0.75*			*0.75*		*0.08*		*0.08*			
Uniform Delay d_1		*2.6*			*2.2*		*26.2*		*25.2*			
Delay Factor k		*0.50*			*0.50*		*0.11*		*0.11*			
Incremental Delay d_2		*0.4*			*0.2*		*2.1*		*0.0*			
PF Factor		*1.000*			*1.000*		*1.000*		*1.000*			
Control Delay		*2.9*			*2.4*		*28.3*		*25.2*			
Lane Group LOS		*A*			*A*		*C*		*C*			
Approach Delay	*2.9*			*2.4*			*28.3*					
Approach LOS	*A*			*A*			*C*					
Intersection Delay	*3.8*			Intersection LOS						*A*		

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *5-13-0064-1 Broad Beach Restoration Project*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group		*T*			*T*		*L*		*R*			
Initial Queue/Lane		*0.0*			*0.0*		*0.0*		*0.0*			
Flow Rate/Lane Group		*982*			*588*		*67*		*0*			
Satflow/Lane		*1900*			*1900*		*1805*		*1615*			
Capacity/Lane Group		*2714*			*2714*		*150*		*135*			
Flow Ratio		*0.3*			*0.2*		*0.0*		*0.0*			
v/c Ratio		*0.36*			*0.22*		*0.45*		*0.00*			
I Factor		*1.000*			*1.000*		*1.000*		*1.000*			
Arrival Type		*3*			*3*		*3*		*3*			
Platoon Ratio		*1.00*			*1.00*		*1.00*		*1.00*			
PF Factor		*1.00*			*1.00*		*1.00*		*1.00*			
Q_1		*2.9*			*1.5*		*1.1*		*0.0*			
k_B		*1.1*			*1.1*		*0.2*		*0.2*			
Q_2		*0.6*			*0.3*		*0.1*		*0.0*			
Q Average		*3.6*			*1.8*		*1.2*		*0.0*			
Percentile Back of Queue (95th percentile)												
$f_{B\%}$		*2.1*			*2.3*		*2.1*		*2.1*			
Back of Queue		*7.4*			*4.2*		*2.5*		*0.0*			
Queue Storage Ratio												
Queue Spacing		*25.0*			*25.0*		*25.0*		*25.0*			
Queue Storage		*0*			*0*		*0*		*0*			
Average Queue Storage Ratio												
95% Queue Storage Ratio												

SHORT REPORT

General Information		Site Information	
Analyst	*TTN*	Intersection	*3*
Agency or Co.	*LLG*	Area Type	*All other areas*
Date Performed	*9/12/2013*	Jurisdiction	*Caltrans/City of Malibu*
Time Period		Analysis Year	

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		*2*			*2*		*1*		*1*			
Lane Group		*T*			*T*		*L*		*R*			
Volume (vph)		*769*			*999*		*68*		*7*			
% Heavy Vehicles		*0*			*0*		*0*		*0*			
PHF		*0.90*			*0.90*		*0.90*		*0.90*			
Pretimed/Actuated (P/A)		*P*			*P*		*A*		*A*			
Startup Lost Time		*2.0*			*2.0*		*2.0*		*2.0*			
Extension of Effective Green		*2.0*			*2.0*		*2.0*		*2.0*			
Arrival Type		*3*			*3*		*3*		*3*			
Unit Extension		*3.0*			*3.0*		*3.0*		*3.0*			
Ped/Bike/RTOR Volume	*0*	*0*		*0*	*0*		*0*	*0*	*0*			
Lane Width		*12.0*			*12.0*		*12.0*		*12.0*			
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*			
Parking/Hour												
Bus Stops/Hour		*0*			*0*		*0*		*0*			
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*				

Phasing	Thru Only	02	03	04	NB Only	06	07	08
Timing	G = *45.0*	G = *0.0*	G =	G =	G = *5.0*	G = *0.0*	G =	G =
	Y = *5*	Y = *0*	Y =	Y =	Y = *5*	Y = *0*	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		*854*			*1110*		*76*		*8*			
Lane Group Capacity		*2714*			*2714*		*150*		*135*			
v/c Ratio		*0.31*			*0.41*		*0.51*		*0.06*			
Green Ratio		*0.75*			*0.75*		*0.08*		*0.08*			
Uniform Delay d_1		*2.5*			*2.7*		*26.3*		*25.3*			
Delay Factor k		*0.50*			*0.50*		*0.12*		*0.11*			
Incremental Delay d_2		*0.3*			*0.5*		*2.8*		*0.2*			
PF Factor		*1.000*			*1.000*		*1.000*		*1.000*			
Control Delay		*2.8*			*3.2*		*29.1*		*25.5*			
Lane Group LOS		*A*			*A*		*C*		*C*			
Approach Delay	*2.8*			*3.2*			*28.8*					
Approach LOS	*A*			*A*			*C*					
Intersection Delay	*4.0*			Intersection LOS						*A*		

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *5-13-0064-1 Broad Beach Restoration Project*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group		*T*			*T*		*L*		*R*			
Initial Queue/Lane		*0.0*			*0.0*		*0.0*		*0.0*			
Flow Rate/Lane Group		*854*			*1110*		*76*		*8*			
Satflow/Lane		*1900*			*1900*		*1805*		*1615*			
Capacity/Lane Group		*2714*			*2714*		*150*		*135*			
Flow Ratio		*0.2*			*0.3*		*0.0*		*0.0*			
v/c Ratio		*0.31*			*0.41*		*0.51*		*0.06*			
I Factor		*1.000*			*1.000*		*1.000*		*1.000*			
Arrival Type		*3*			*3*		*3*		*3*			
Platoon Ratio		*1.00*			*1.00*		*1.00*		*1.00*			
PF Factor		*1.00*			*1.00*		*1.00*		*1.00*			
Q_1		*2.4*			*3.5*		*1.2*		*0.1*			
k_B		*1.1*			*1.1*		*0.2*		*0.2*			
Q_2		*0.5*			*0.8*		*0.2*		*0.0*			
Q Average		*2.9*			*4.3*		*1.4*		*0.1*			
Percentile Back of Queue (95th percentile)												
$f_{B\%}$		*2.2*			*2.0*		*2.1*		*2.1*			
Back of Queue		*6.3*			*8.6*		*2.9*		*0.3*			
Queue Storage Ratio												
Queue Spacing		*25.0*			*25.0*		*25.0*		*25.0*			
Queue Storage		*0*			*0*		*0*		*0*			
Average Queue Storage Ratio												
95% Queue Storage Ratio												

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*TTN*
Agency/Co.	*LLG*
Date Performed	*9/12/2013*
Analysis Time Period	*Weekday AM Peak Hour*

Site Information

Intersection	*4*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernsey Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*147*	*662*		*0*	*407*	*56*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*147*	*662*	*0*	*0*	*407*	*56*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*		*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*53*		*115*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*53*	*0*	*115*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*147*	*0*					*168*	
C (m) (veh/h)	*1109*	*936*					*397*	
v/c	*0.13*	*0.00*					*0.42*	
95% queue length	*0.46*	*0.00*					*2.05*	
Control Delay (s/veh)	*8.7*	*8.8*					*20.6*	
LOS	*A*	*A*					*C*	
Approach Delay (s/veh)	--	--				*20.6*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*TTN*
Agency/Co.	*LLG*
Date Performed	*9/12/2013*
Analysis Time Period	*Weekday PM Peak Hour*

Site Information

Intersection	*4*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernsey Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*30*	*679*		*0*	*960*	*18*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*30*	*679*	*0*	*0*	*960*	*18*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*		*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*18*		*39*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*18*	*0*	*39*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*30*	*0*					*57*	
C (m) (veh/h)	*714*	*923*					*274*	
v/c	*0.04*	*0.00*					*0.21*	
95% queue length	*0.13*	*0.00*					*0.77*	
Control Delay (s/veh)	*10.3*	*8.9*					*21.6*	
LOS	*B*	*A*					*C*	
Approach Delay (s/veh)	--	--				*21.6*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*TTN*
Agency/Co.	*LLG*
Date Performed	*9/26/2013*
Analysis Time Period	*Weekday AM Peak Hour*

Site Information

Intersection	*4*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing+Project*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernsey Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*147*	*662*	*75*	*0*	*414*	*56*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*147*	*662*	*75*	*0*	*414*	*56*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*1*	*1*	*2*	*0*
Configuration	*L*	*T*	*R*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*53*		*115*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*53*	*0*	*115*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*147*	*0*					*168*	
C (m) (veh/h)	*1102*	*878*					*394*	
v/c	*0.13*	*0.00*					*0.43*	
95% queue length	*0.46*	*0.00*					*2.08*	
Control Delay (s/veh)	*8.8*	*9.1*					*20.8*	
LOS	*A*	*A*					*C*	
Approach Delay (s/veh)	--	--				*20.8*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*TTN*
Agency/Co.	*LLG*
Date Performed	*9/12/2013*
Analysis Time Period	*Weekday PM Peak Hour*

Site Information

Intersection	*4*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing+Project*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernsey Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*30*	*686*	*60*	*0*	*960*	*18*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*30*	*686*	*60*	*0*	*960*	*18*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*1*	*1*	*2*	*0*
Configuration	*L*	*T*	*R*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*18*		*39*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*18*	*0*	*39*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*30*	*0*					*57*	
C (m) (veh/h)	*714*	*871*					*274*	
v/c	*0.04*	*0.00*					*0.21*	
95% queue length	*0.13*	*0.00*					*0.77*	
Control Delay (s/veh)	*10.3*	*9.1*					*21.6*	
LOS	*B*	*A*					*C*	
Approach Delay (s/veh)	--	--				*21.6*		
Approach LOS	--	--				*C*		

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INTERSECTION CAPACITY UTILIZATION

Heathercliff Road @ Pacific Coast Highway

N-S St: Heathercliff Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU5

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	148	1600	0.093	7	155	0.097	0	155	1600	0.097	0	155	1600	0.097	0	155	1600	0.097	0	155	1600	0.097
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	107	1600	0.067	5	112	0.070	0	112	1600	0.070	0	112	1600	0.070	0	112	1600	0.070	0	112	1600	0.070
Sb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Eb Thru	916	3200	0.286 *	46	962	0.301 *	0	962	3200	0.301 *	0	962	3200	0.301 *	0	962	3200	0.301 *	0	962	3200	0.301 *
Eb Right	103	1600	0.064	5	108	0.068	0	108	1600	0.068	0	108	1600	0.068	0	108	1600	0.068	0	108	1600	0.068
Wb Left	147	1600	0.092 *	7	154	0.096 *	0	154	1600	0.096 *	0	154	1600	0.096 *	0	154	1600	0.096 *	0	154	1600	0.096 *
Wb Thru	753	3200	0.235	38	791	0.247	7	798	3200	0.249	0	798	3200	0.249	0	798	3200	0.249	0	798	3200	0.249
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.521			0.544				0.544				0.544				0.544				0.544
LOS			A			A				A				A				A				A

01:32 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Heathercliff Road @ Pacific Coast Highway

N-S St: Heathercliff Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU5

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	123	1600	0.077	6	129	0.081	0	129	1600	0.081	0	129	1600	0.081	0	129	1600	0.081	0	129	1600	0.081
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	165	1600	0.103 *	8	173	0.108 *	0	173	1600	0.108 *	0	173	1600	0.108 *	0	173	1600	0.108 *	0	173	1600	0.108 *
Sb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Eb Thru	921	3200	0.288 *	46	967	0.302 *	7	974	3200	0.304 *	0	974	3200	0.304 *	0	974	3200	0.304 *	0	974	3200	0.304 *
Eb Right	70	1600	0.044	4	74	0.046	0	74	1600	0.046	0	74	1600	0.046	0	74	1600	0.046	0	74	1600	0.046
Wb Left	160	1600	0.100 *	8	168	0.105 *	0	168	1600	0.105 *	0	168	1600	0.105 *	0	168	1600	0.105 *	0	168	1600	0.105 *
Wb Thru	901	3200	0.282	45	946	0.296	0	946	3200	0.296	0	946	3200	0.296	0	946	3200	0.296	0	946	3200	0.296
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.541			0.565				0.568				0.568				0.568				0.568
LOS			A			A				A				A				A				A

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INTERSECTION CAPACITY UTILIZATION

Kanan Dume Road @ Pacific Coast Highway

N-S St: Kanan Dume Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU6

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Sb Left	284	0	0.178	14	298	0.186	0	298	0	0.186	0	298	0	0.186	0	298	0	0.186	0	298	0	0.186
Sb Thru	0	1600	0.318 *	0	0	0.334 *	0	0	1600	0.334 *	0	0	1600	0.334 *	0	0	1600	0.334 *	0	0	1600	0.334 *
Sb Right	225	0	-	11	236	-	0	236	0	-	0	236	0	-	0	236	0	-	0	236	0	-
Eb Left	172	1600	0.108 *	9	181	0.113 *	0	181	1600	0.113 *	0	181	1600	0.113 *	0	181	1600	0.113 *	0	181	1600	0.113 *
Eb Thru	1039	3200	0.325	52	1091	0.341	0	1091	3200	0.341	0	1091	3200	0.341	0	1091	3200	0.341	0	1091	3200	0.341
Eb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Wb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Wb Thru	862	3200	0.301 *	43	905	0.316 *	7	912	3200	0.318 *	0	912	3200	0.318 *	0	912	3200	0.318 *	0	912	3200	0.318 *
Wb Right	101	0	-	5	106	-	0	106	0	-	0	106	0	-	0	106	0	-	0	106	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.777			0.813				0.815				0.815				0.815				0.815
LOS			C			D				D				D				D				D

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** Key conflicting movement as a part of ICU*
1 Counts conducted by: City Traffic Counters
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Kanan Dume Road @ Pacific Coast Highway

N-S St: Kanan Dume Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU6

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Sb Left	166	0	0.104	8	174	0.109	0	174	0	0.109	0	174	0	0.109	0	174	0	0.109	0	174	0	0.109
Sb Thru	0	1600	0.253 *	0	0	0.265 *	0	0	1600	0.265 *	0	0	1600	0.265 *	0	0	1600	0.265 *	0	0	1600	0.265 *
Sb Right	238	0	-	12	250	-	0	250	0	-	0	250	0	-	0	250	0	-	0	250	0	-
Eb Left	251	1600	0.157 *	13	264	0.165 *	0	264	1600	0.165 *	0	264	1600	0.165 *	0	264	1600	0.165 *	0	264	1600	0.165 *
Eb Thru	1067	3200	0.333	53	1120	0.350	7	1127	3200	0.352	0	1127	3200	0.352	0	1127	3200	0.352	0	1127	3200	0.352
Eb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Wb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Wb Thru	1196	3200	0.448 *	60	1256	0.470 *	0	1256	3200	0.470 *	0	1256	3200	0.470 *	0	1256	3200	0.470 *	0	1256	3200	0.470 *
Wb Right	237	0	-	12	249	-	0	249	0	-	0	249	0	-	0	249	0	-	0	249	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.907			0.950				0.950				0.950				0.950				0.950
LOS			E			E				E				E				E				E

01:32 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: City Traffic Counters
2 Capacity expressed in veh/hour of green

APPENDIX C

HCM SEGMENT DATA WORKSHEETS – WEEKDAY PEAK HOUR

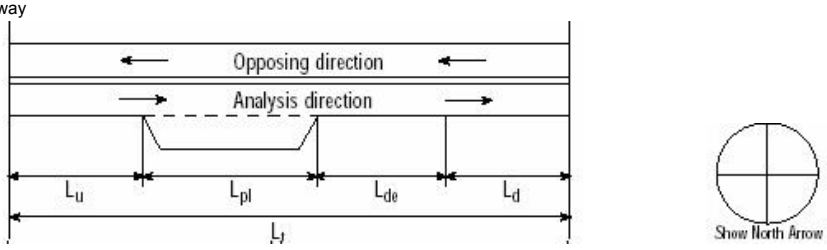
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		Site Information	
Analyst	*TTN*	Highway of Travel	*1 - Pacific Coast Highway*
Agency or Company	*LLG*	From/To	*Las Posas to Yerba Buena*
Date Performed	*10/9/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*Weekday Peak Hour*	Analysis Year	*Existing Year 2014*

Project Description: *5-13-0064-1 - Broad Beach Restoration Project*

Input Data

☑ Class I highway ☐ Class II highway



Total length of analysis segment, L_t (*mi*)	*1.0*
Length of two-lane highway upstream of the passing lane, L_u (*mi*)	*0.0*
Length of passing lane including tapers , L_{pl} (*mi*)	*0.9*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*46.7*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*68.9*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*D*
Average Travel Speed	
Downstream length of two-lane highway within effective length of passing lane for average travel speed, L_{de} (*mi*) (Exhibit 20-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d (*mi*) $L_d=L_t-(L_u+L_{pl}+L_{de})$	*-1.60*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 20-24)	*1.11*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl})+(2L_{de}/(1+f_{pl})))$	*51.8*
Percent Time-Spent-Following	
Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, L_{de} (*mi*)(Exhibit 20-23)	*5.96*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, L_d (*mi*)$=L_t-(L_u+L_{pl}+L_{de})$	*-5.86*
Adj. factor for the effect of passing lane on percent time-spent-following, f_{pl}(Exhibit 20-24)	*0.62*
Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl}= PTSF_d[L_u+L_d+f_{pl}L_{pl}+((1+f_{pl})/2)L_{de}]/L_t$	*42.8*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 20-3 or 20-4)	*B*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS_{pl}$	*3.2*

Notes

1. If LOS_d=F, passing lane analysis cannot be performed.
2. If L_d <0, use alternative Equation 20-22.
3. If L_d<0, use alternative Equation 20-20.
4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.

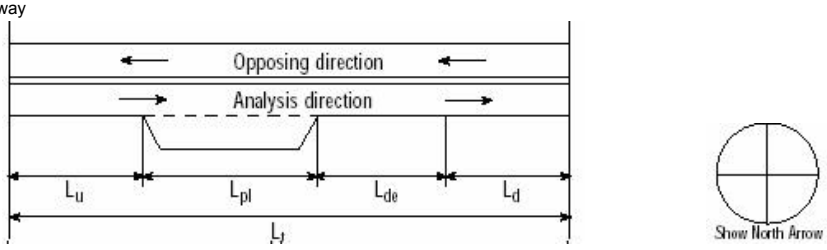
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		Site Information	
Analyst	*TTN*	Highway of Travel	*1 - Pacific Coast Highway*
Agency or Company	*LLG*	From/To	*Las Posas to Yerba Buena*
Date Performed	*10/9/2013*	Jurisdiction	*Caltrans*
Analysis Time Period	*Weekday Peak Hour*	Analysis Year	*Existing Year 2014*

Project Description: *5-13-0064-1 - Broad Beach Restoration Project*

Input Data

☑ Class I highway ☐ Class II highway



Total length of analysis segment, L_t (*mi*)	*1.0*
Length of two-lane highway upstream of the passing lane, L_u (*mi*)	*0.0*
Length of passing lane including tapers , L_{pl} (*mi*)	*0.9*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*45.6*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*72.9*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*D*
Average Travel Speed	
Downstream length of two-lane highway within effective length of passing lane for average travel speed, L_{de} (*mi*) (Exhibit 20-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d (*mi*) $L_d=L_t-(L_u+L_{pl}+L_{de})$	*-1.60*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 20-24)	*1.11*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl})+(2L_{de}/(1+f_{pl})))$	*50.6*
Percent Time-Spent-Following	
Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, L_{de} (*mi*)(Exhibit 20-23)	*5.40*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, L_d (*mi*)$=L_t-(L_u+L_{pl}+L_{de})$	*-5.30*
Adj. factor for the effect of passing lane on percent time-spent-following, f_{pl}(Exhibit 20-24)	*0.62*
Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl}= PTSF_d[L_u+L_d+f_{pl}L_{pl}+((1+f_{pl})/2)L_{de}]/L_t$	*45.2*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 20-3 or 20-4)	*B*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS_{pl}$	*3.7*

Notes

1. If LOS_d=F, passing lane analysis cannot be performed.
2. If L_d <0, use alternative Equation 20-22.
3. If L_d<0, use alternative Equation 20-20.
4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.

APPENDIX D

ZUMA COUNTY BEACH DAILY PARKING COUNTS

APPENDIX TABLE D-1
PARKING COUNTS
Zuma County Beach Parking Lots

DAY	MONTH (YEAR) SEPT. 2012	OCT.	NOV.	DEC.	JAN. 2013	FEB.	MAR.	APR.	MAY	
1	1466	200	136	1312	41	168	294	61	219	
2	2766	132	29	1039	36	293	875	114	206	
3	2741	52	44	8	45	265	357	312	285	
4	320	63	204	62	103	128	87	115	301	
5	146	52	126	103	88	97	54	142	136	
6	237	218	127	8	42	91	36	362	-	
7	309	218	25	57	274	97	46	265	47	
8	980	42	13	161	241	73	26	22	125	
9	624	104	25	27	187	329	211	52	117	
10	92	24	37	33	134	265	412	188	77	
11	59	16	1406	28	27	121	117	54	743	
12	76	36	24	79	22	143	85	105	954	
13	78	113	18	69	16	129	128	244	219	
14	382	188	38	84	13	143	133	65	116	
15	1560	130	29	60	14	329	215	128	60	
16	938	317	63	9	11	499	194	22	71	
17	504	141	11	12	34	597	174	85	85	
18	79	163	24	59	43	319	144	101	353	
19	100	44	30	44	105	85	227	214	651	
20	97	31	179	97	181	132	177	648	195	
21	411	40	33	21	327	94	181	611	58	
22	371	22	39	15	39	188	125	107	50	
23	-	25	86	20	12	426	1047	91	74	
24	107	26	127	15	35	500	494	11	143	
25	67	28	39	112	85	135	147	37	371	
26	233	58	19	44	178	154	392	103	1005	
27	49	341	13	35	26	127	204	519	2109	
28	58	36	8	38	26	174	54	556	101	
29	311	41	13	4	15		244	92	198	
30	443	86	7	35	21		375	46	200	**GRAND**
31		20		47	44		312		397	**TOTAL**
TOTAL	**15604**	**3007**	**2972**	**3737**	**2465**	**6101**	**7567**	**5472**	**9666**	56591

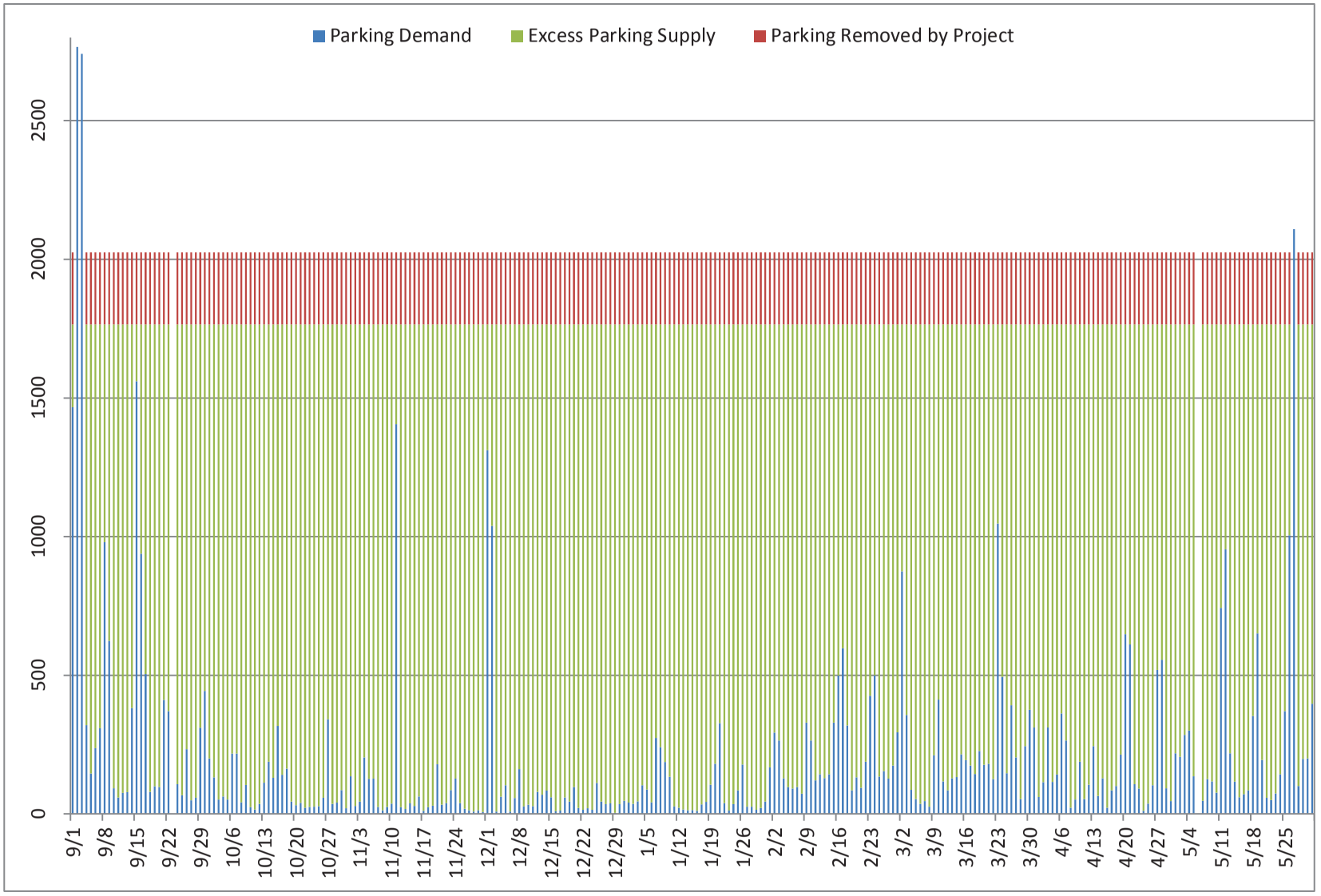
[1] Counts provided by Los Angeles County Department of Beaches and Harbors.

APPENDIX TABLE D-2
PARKING UTILIZATION
Zuma County Beach Parking Lots

PARKING	DAY	MONTH (YEAR)																	
		SEPT. 2012		OCT.		NOV.		DEC.		JAN. 2013		FEB.		MAR.		APR.		MAY	
SUPPLY		NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
2025	1	1466	72%	200	10%	136	7%	1312	65%	41	2%	168	8%	294	15%	61	3%	219	11%
2025	2	2766	137%	132	7%	29	1%	1039	51%	36	2%	293	14%	875	43%	114	6%	206	10%
2025	3	2741	135%	52	3%	44	2%	8	0%	45	2%	265	13%	357	18%	312	15%	285	14%
2025	4	320	16%	63	3%	204	10%	62	3%	103	5%	128	6%	87	4%	115	6%	301	15%
2025	5	146	7%	52	3%	126	6%	103	5%	88	4%	97	5%	54	3%	142	7%	136	7%
2025	6	237	12%	218	11%	127	6%	8	0%	42	2%	91	4%	36	2%	362	18%	-	-
2025	7	309	15%	218	11%	25	1%	57	3%	274	14%	97	5%	46	2%	265	13%	47	2%
2025	8	980	48%	42	2%	13	1%	161	8%	241	12%	73	4%	26	1%	22	1%	125	6%
2025	9	624	31%	104	5%	25	1%	27	1%	187	9%	329	16%	211	10%	52	3%	117	6%
2025	10	92	5%	24	1%	37	2%	33	2%	134	7%	265	13%	412	20%	188	9%	77	4%
2025	11	59	3%	16	1%	1406	69%	28	1%	27	1%	121	6%	117	6%	54	3%	743	37%
2025	12	76	4%	36	2%	24	1%	79	4%	22	1%	143	7%	85	4%	105	5%	954	47%
2025	13	78	4%	113	6%	18	1%	69	3%	16	1%	129	6%	128	6%	244	12%	219	11%
2025	14	382	19%	188	9%	38	2%	84	4%	13	1%	143	7%	133	7%	65	3%	116	6%
2025	15	1560	77%	130	6%	29	1%	60	3%	14	1%	329	16%	215	11%	128	6%	60	3%
2025	16	938	46%	317	16%	63	3%	9	0%	11	1%	499	25%	194	10%	22	1%	71	4%
2025	17	504	25%	141	7%	11	1%	12	1%	34	2%	597	29%	174	9%	85	4%	85	4%
2025	18	79	4%	163	8%	24	1%	59	3%	43	2%	319	16%	144	7%	101	5%	353	17%
2025	19	100	5%	44	2%	30	1%	44	2%	105	5%	85	4%	227	11%	214	11%	651	32%
2025	20	97	5%	31	2%	179	9%	97	5%	181	9%	132	7%	177	9%	648	32%	195	10%
2025	21	411	20%	40	2%	33	2%	21	1%	327	16%	94	5%	181	9%	611	30%	58	3%
2025	22	371	18%	22	1%	39	2%	15	1%	39	2%	188	9%	125	6%	107	5%	50	2%
2025	23	-	-	25	1%	86	4%	20	1%	12	1%	426	21%	1047	52%	91	4%	74	4%
2025	24	107	5%	26	1%	127	6%	15	1%	35	2%	500	25%	494	24%	11	1%	143	7%
2025	25	67	3%	28	1%	39	2%	112	6%	85	4%	135	7%	147	7%	37	2%	371	18%
2025	26	233	12%	58	3%	19	1%	44	2%	178	9%	154	8%	392	19%	103	5%	1005	50%
2025	27	49	2%	341	17%	13	1%	35	2%	26	1%	127	6%	204	10%	519	26%	2109	104%
2025	28	58	3%	36	2%	8	0%	38	2%	26	1%	174	9%	54	3%	556	27%	101	5%
2025	29	311	15%	41	2%	13	1%	4	0%	15	1%			244	12%	92	5%	198	10%
2025	30	443	22%	86	4%	7	0%	35	2%	21	1%			375	19%	46	2%	200	10%
2025	31			20	1%			47	2%	44	2%			312	15%			397	20%
	AVERAGE	**538**	**27%**	**97**	**5%**	**99**	**5%**	**121**	**6%**	**80**	**4%**	**218**	**11%**	**244**	**12%**	**182**	**9%**	**322**	**16%**

[1] Counts provided by Los Angeles County Department of Beaches and Harbors.

APPENDIX FIGURE D-1
PARKING SUPPLY AND DEMAND



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PEER REVIEW OF THE TRAFFIC AND PARKING ASSESSMENT FOR THE BROAD BEACH RESTORATION PROJECT, CITY OF MALIBU

Associated Transportation Engineers (ATE) has completed a peer review of the traffic and parking assessment prepared by LLG for the Broad Beach Restoration Project (LLG study dated October 22, 2013). The purpose of the LLG study is to identify potential traffic and parking impacts related to the project and recommend appropriate mitigation measures. Our peer review included assessment of the key analysis assumptions, impact analysis methodologies, identification of potential impacts, and review of proposed mitigation measures. The following text summarizes the findings of our peer review.

Project Description/Traffic Study Assumptions

The project entails hauling 600,000 cubic yards of sand to Broad Beach from up to three off-site quarry locations to restore the beach and protect it from further erosion. The LLG study used the following assumptions for the traffic and parking analysis:

- Restore Broad Beach by hauling approximately 600,000 cubic yards of sand to the beach over a period of six months. The construction period would start no earlier than mid/late September and be completed prior to the beginning of the following summer peak beach visitation period.

- Trucks will haul sand from up to three quarries located in the Fillmore, Simi Valley, and Moorpark areas. Double trailer bottom dump trucks with a capacity of 20 cubic yards of material carrying 14 cubic yards of sand are planned to be used for the project. Haul trucks are anticipated to travel to the site five days a week (Monday through Friday), 11 hours per day (beginning approximately at 7:00 AM and ending approximately at 6:00 PM). A total of 30 trucks will arrive at and depart the site every hour, which equates to 330 inbound trips and 330 outbound trips per work day.

- It is estimated that 15 construction workers will be on-site during the hauling phase of the project. Construction workers are expected to typically arrive at the site before 7:00 AM and depart after 6:00 PM.

- Lot 12 within Zuma Beach will be temporarily used as a staging area and dump site during the six month hauling period and would therefore be closed to the general public.

- Vehicular access to the staging area will be provided via two driveways on PCH. A temporary inbound driveway will be located on the south side of PCH at the east end of Lot 12 directly across from Guernsey Avenue. A temporary eastbound right-turn deceleration lane will be installed on PCH at the inbound driveway. The outbound driveway will be located on the south side of Pacific Coast Highway at the west end of Lot 12 where an existing driveway is located. The intersection will be reconfigured to accommodate truck turns and a temporary traffic signal will be installed at this location.

- Existing parking along the south shoulder of PCH will be prohibited during the construction period to accommodate the right-turn lane and minimize pedestrian traffic along PCH in the vicinity of the project driveways. Parking will be prohibited between the two driveways (about 660 feet, which equates to 33 parking spaces) as well as west of the outbound driveway (about 180 feet, which equates to 9 parking spaces).

- Emergency vehicle access will continue to be provided to the building located just east of the project staging area. Emergency vehicles will still be able to gain access to the building via the inbound and/or outbound PCH driveways constructed by the project.

Traffic Impact Thresholds

The LLG traffic study applied the City of Malibu's *Traffic Impact Analysis Guidelines*, August, 2012. ATE concurs that these are the appropriate impact thresholds since the project is located within the City of Malibu.

Study Area

The LLG traffic study analyzes potential traffic impacts at six intersections along PCH in the vicinity of the site as well as impacts to traffic flows along the two-lane section of the PCH between Las Posas Road and Yerba Buena Road. Potential parking impacts are assessed for the Zuma Beach public parking lots as well as the parking spaces along the south side of PCH in the vicinity of the two driveways used for project access. It is our opinion that the study area adequately covers the facilities that could be potentially impacted by the construction project.

Level of Service Methodologies

The LLG traffic study uses the ICU methodology for analyzing the operations of the signalized intersections. This is consistent with both the City of Malibu and the County of Los Angeles policies. However, the ICU analyses completed for the study utilized a yellow interval of 0.05, which is inconsistent with the approach used by the City of Malibu and the County of Los Angeles. These jurisdictions apply a yellow interval of 0.10 (see Recommended Report Modifications).

The LLG study uses the Highway Capacity Manual (HCM) methodology for unsignalized intersections and for assessing operations for the segment of PCH between Las Posas and Yerba Buena, which is appropriate. However, the analysis utilizes an older 2005 version of the HCM which has been updated several times. The analysis should utilize the most current version of the HCM (see Recommended Report Modifications).

A "passenger car equivalency" factor of 2.0 was utilized in the LLG study for truck trips when calculating levels of service in order to properly account for the large trucks used to transport sand to the site. ATE agrees that this is an appropriate assumption for assessing traffic impacts generated by the proposed project.

Existing Traffic Volumes

The traffic counts used in the study were taken in 2007, 2012, and 2013. The older traffic counts were adjusted by applying a 1% per year growth factor to represent 2014 conditions. Comparison of the data that was factored from 2007 to 2014 with recent count data shows that this approach is conservative as it produces volumes that are greater than the current intersection volumes measured on PCH.

It is noted that the volumes presented for the PCH/Trancas Canyon Road intersection are reversed in the northbound to southbound and eastbound to westbound directions (see Recommended Report Revisions).

Project Trip Generation and Trip Distribution

Our review of the trip generation and distribution parameters used in the LLG study found that they are reasonable. The LLG study assumes that 30 trucks will arrive at and depart the staging area every hour, which equates to 330 trucks per day, or 660 truck *trips* per day (330 inbound trips and 330 outbound trips). Additionally, the study assumes 30 employee trips per day (15 inbound trips and 15 outbound trips) during the hauling phase of the project. The LLG study assumes that all of the employee trips would occur during the A.M. and P.M. peak periods, even though construction workers are expected to arrive at the site before 7:00 AM and most will depart after 6:00 PM. Thus, this is a conservative estimate for the impact analysis.

Intersection Impacts

The LLG study assesses potential impacts to the study-area intersections using City of Malibu impact criteria. The study finds that the proposed project would not significantly impact the intersections in the study area. As noted above, the level of service analyses should be updated using the correct loss time for the signalized intersections and the most current version of the HCM for the unsignalized intersections (see Recommended Report Revisions).

Highway Impacts

The LLG study assesses potential impacts to the two-lane segment of PCH between Las Posas and Yerba Buena using HCM methods. The study finds that the proposed project would not significantly impact PCH since it would not degrade level of service along of PCH. As noted above, the level of service analyses should be updated using the most current version of the HCM (see Recommended Report Revisions).

Other Affected Roadways

The LLG study makes the finding that the project would not generate significant impacts along the proposed haul routes that are out of the project study area since the project would not significantly impact the segments of PCH and the intersections within the vicinity of the project site. The study discusses potential impacts to Las Posas Road/PCH Interchange, and along Las Posas Road, Lewis Road, U.S. 101, SR 34, and SR 118 along the multiple routes that would be used to access the three sand source quarries. ATE agrees with the conclusion that the project would not generate significant impacts along the proposed haul routes since the project's hourly trip generation is relatively low and project-generated traffic will disperse outside of the project study area.

Parking Impacts

The LLG study indicated that the project would not significantly impact parking in the vicinity of the site. There are approximately 2,025 off-street parking spaces located in 12 parking lots within Zuma County Beach. There are 260 spaces provided within Parking Lot 12 plus 42 spaces along PCH that would be temporarily closed for the access to the staging area. The parking demand data presented in the LLG study show that peak utilization of onsite lots range up to 1,560 spaces during the non-summer months of September through May (excluding the Labor Day Weekend and the Memorial Day Weekend). Even with the removal of 260 spaces within Parking Lot 12 and the 42 spaces along PCH, there would be adequate parking within the Zuma Beach parking lots to accommodate the non-summer demands. Since the project is proposed to occur during non-summer months it would not significant impact parking at Zuma County Beach (the construction period is schedule to start no earlier than mid/late September and be completed prior to the following summer peak beach visitation period).

Site Access

Vehicular access to the staging area is planned via a new inbound driveway on PCH directly across from Guernsey Avenue and an outbound driveway on PCH at the west end of Lot 12 where an existing driveway is located. A temporary eastbound right-turn deceleration lane will be installed at the inbound driveway to facilitate movements into the staging area and a temporary traffic signal will be installed at the outbound driveway to facilitate vehicles leaving the site. Parking along the south side of PCH will be prohibited in the vicinity of the two driveways during the construction period to accommodate the right-turn lane and minimize pedestrian traffic along PCH.

Figure 3 in the LLG report provides a schematic showing the site circulation plan and a discussion of the improvements proposed to accommodate access is provided on Pages 2 and 3 of the report. The report does not, however, provide a discussion or analysis of how the plan will address pedestrians, bicycles, non-construction traffic turning into the driveways, advanced signage, and traffic control plan requirements (see Recommended Report Revisions).

Mitigation Measures

The LLG traffic study does not include any mitigation measures since it found no significant traffic or parking impacts. However, as noted above, the LLG study does not address potential impacts and mitigations for pedestrians and bicyclists that may be traveling along the south side of PCH in the vicinity of the site access driveways. The access plan for the project also relies on temporary modifications to the PCH and the Zuma Beach parking lot to accommodate truck access. The level of truck activity associated with the project will likely impact the structural section of the parking lot. No mitigation measures are provided in the study to remove the temporary modifications and repair the roadway and parking lot to existing conditions after the project is completed.

RECOMMENDED REPORT REVISIONS

Based on our peer review, the following revisions are recommended for the traffic and parking assessment prepared by LLG.

1. Existing Traffic Volumes. The traffic volumes reported for the PCH/Trancas Canyon Road intersection are reversed in the northbound to southbound and eastbound to westbound directions. The report figures and intersection level of service calculations should be revised to correct this error.

2. Level of Service Calculations. The ICU analyses completed for the study utilized a yellow interval of 0.05, which is inconsistent with the methodology used by City of Malibu and the County of Los Angeles. These jurisdictions apply a yellow interval of 0.10 (see attached excerpt from the Los Angeles County Traffic Study Guidelines). The intersection level of service calculations should be revised with the correct yellow interval.

3. Level of Service Calculations. The HCM analysis completed for the unsignalized intersections and PCH utilized an older 2005 version of the HCM. The unsignalized intersection and roadway segment analyses should be updated utilizing the most current version 2010 version of the HCM.

4. Site Circulation - Pedestrians and Bicycles. The study should provide a discussion of how pedestrians and bicycles will be accommodated on the south side of PCH through the construction zone.

5. Site Circulation - Entry Driveway. A temporary entry driveway for Lot 12 will be located on PCH opposite the Guernsey Avenue intersection. A temporary eastbound right-turn lane will be provided on PCH at the driveway and there is an existing westbound left-turn lane that currently accommodates U-Turns at the intersection. The study should address the following issues:

   - How will the new right-turn lane on PCH be striped/signed to prohibit the public from turning into the parking lot?
   - How will the existing eastbound left-turn lane on PCH will be striped/signed to prohibit left-turn movements into the new driveway.
   - How will the driveway be controlled during nights and weekends periods when construction activities are not occurring.

6. Site Circulation - Exit Driveway. A temporary traffic signal will be installed at the driveway located at the west end of Lot 12 to accommodate outbound movements onto PCH. The study should address the following:

   - How will the intersection be designed to ensure that vehicles do not turn right or left into the one-way outbound driveway?
   - How will pedestrians and bicycles be accommodated at the temporary traffic signal?
   - How will the driveway be controlled during nights and weekends periods when construction activities are not occurring.

7. Mitigation Measures. The traffic and parking analysis contains no mitigation measures. It is recommended that the following measures be included in the report.

   A. Traffic Control Plan. The project should develop a traffic control plan to address vehicular access to the site and pedestrian and bicycle flows on PCH. The plan should include recommendations for signage, striping, traffic controls, etc. The plan will need to be approved by Caltrans through the encroachment permit process.

B. Roadway and Parking Lot Repair. The temporary access improvements implemented as part of the project should be removed upon project completion. Damaged caused by the construction activities to the PCH/Site Access Driveways and the Zuma Beach parking lot should be repaired after the construction project is completed. A video log should be recorded prior to construction activities to document existing pavement conditions.

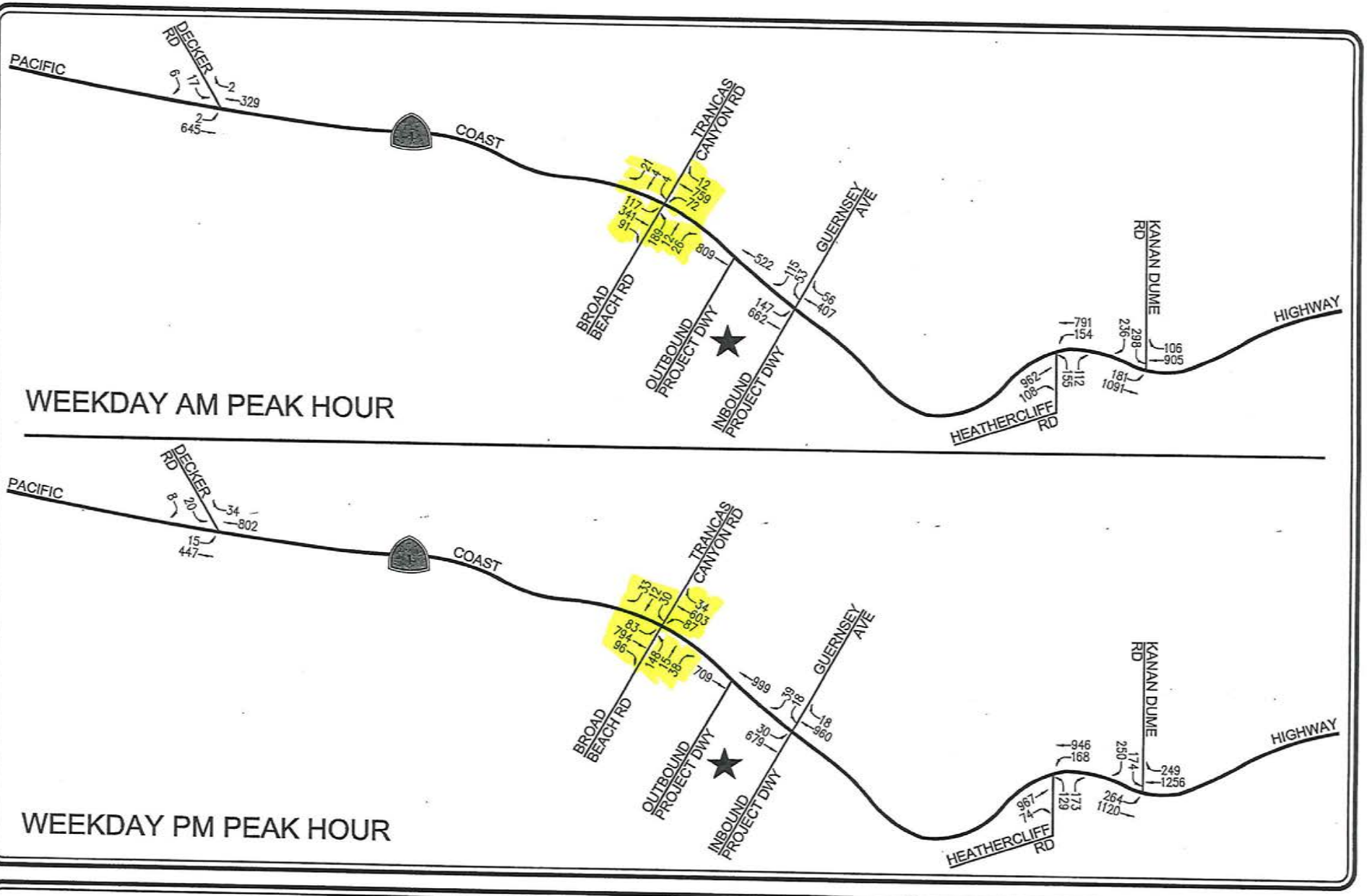
This concludes our peer review of the LLG traffic study prepared for the Broad Beach Project.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP
Principal Transportation Planner

SAS/DLD

Attachments



NOT TO SCALE

PROJECT STAGING AREA

FIGURE 6
EXISTING TRAFFIC VOLUMES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

c:\0064\dwg\f6.dwg 09/26/2013 16:43:35 nguyen llg exhibits color.ctb

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Trancas Canyon Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	2	1	1	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	35	1	12	0	0	9	13	108	23	11	123	3	338
4:15 PM	39	5	14	3	3	7	9	173	16	13	144	1	427
4:30 PM	22	2	8	5	7	7	16	204	13	13	171	7	475
4:45 PM	40	5	6	3	1	4	16	157	30	15	106	0	383
5:00 PM	36	2	7	1	0	5	14	194	29	19	101	0	408
5:15 PM	34	1	15	0	2	4	10	193	25	16	106	0	406
5:30 PM	46	2	11	0	2	7	18	181	26	18	114	2	427
5:45 PM	45	5	8	0	0	4	20	167	27	18	81	1	376
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	297	23	81	12	15	47	116	1377	189	123	946	14	3240

PM Peak Hr Begins at: 415 PM

PEAK VOLUMES =	137	14	35	12	11	23	55	728	88	60	522	8	1693
PEAK HR. FACTOR:		0.802			0.605			0.919			0.772		0.891

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Trancas Canyon Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	2	1	1	2	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	14	0	5	1	1	3	19	54	16	17	135	1	266
7:15 AM	20	3	13	0	0	1	20	73	16	18	163	0	327
7:30 AM	28	2	2	0	2	2	23	65	17	12	190	0	343
7:45 AM	65	1	3	0	0	5	31	97	27	14	195	0	438
8:00 AM	62	5	6	0	2	10	25	69	24	19	151	1	374
8:15 AM	48	7	7	1	1	5	26	88	13	16	103	1	316
8:30 AM	40	2	3	1	2	6	31	93	19	14	124	1	336
8:45 AM	43	5	2	0	2	2	28	94	14	16	140	1	347
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													
TOTAL VOLUMES =	NL 320	NT 25	NR 41	SL 3	ST 10	SR 34	EL 203	ET 633	ER 146	WL 126	WT 1201	WR 5	TOTAL 2747

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	175	11	24	0	4	18	99	304	84	63	699	1	1482
PEAK HR. FACTOR:		0.719			0.458			0.785			0.913		0.846

CONTROL: Signalized

Traffic Impact Analysis Report Guidelines

January 1, 1997

Prepared by the County of Los Angeles
Department of Public Works

Donald L. Wolfe
Acting Director of Public Works

The County of Los Angeles Department of Regional Planning (DRP) and other public agencies (if necessary) should be contacted to obtain the latest listings. A table and a map showing the status, project/zone change/conditional use permit/parcel map/tract number, and the location of each project must be provided. For a computer printout of the listing of all filed projects within the County, Land Development Management Section of the DRP, at (213) 974-6481 can be contacted.

4. LOS Analysis

If it appears that the project's generated traffic alone or together with other projects in the area could worsen the LOS of an intersection or roadway, a "before" and "after" LOS analysis is necessary. The Intersection Capacity Utilization (ICU) or Critical Movement Analysis are two methods often used to assess existing and future LOS at intersections.

If the ICU planning method is used, a maximum of 1,600 vehicles per hour per lane should be used (2,880 vehicles per hour should be used for dual left-turn lanes) and a ten percent yellow clearance cycle should be included. Intersection LOS analysis and calculation work sheets, as well as diagrams showing turning volumes shall be included in the report for the following traffic conditions.

(a) Existing traffic;
(b) Existing traffic plus ambient growth to the year the project will be completed (preproject);
(c) Traffic in (b) plus project traffic;
(d) Traffic in (c) with the proposed mitigation measures (if necessary);
(e) Traffic in (c) plus the cumulative traffic of other known developments; and
(f) Traffic in (e) with the proposed mitigation measures (if necessary).

The project's impact on two-lane roadways should also be analyzed for all of the above traffic conditions if those two-lane roadways are used for access. LOS service analysis contained in the Highway Capacity Analysis, Chapter 8, Two-Lane Highways, should be used to evaluate the project=s impact. For simplified

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INTERSECTION CAPACITY UTILIZATION

N-S St: Trancas Canyon Road-Broad Beach Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU2

Trancas Canyon Road-Broad Beach Road @ Pacific Coast Highway
Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	180	0	0.113	9	189	0.118	0	189	0	0.118	0	189	0	0.118	0	189	0	0.118	0	189	0	0.118
Nb Thru	11	1600	0.135 *	1	12	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *
Nb Right	25	0	-	1	26	-	0	26	0	-	0	26	0	-	0	26	0	-	0	26	0	-
Sb Left	4	0	0.003 *	0	4	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *
Sb Thru	4	1600	0.018	0	4	0.018	0	4	1600	0.018	0	4	1600	0.018	0	4	1600	0.018	0	4	1600	0.018
Sb Right	20	0	-	1	21	-	0	21	0	-	0	21	0	-	0	21	0	-	0	21	0	-
Eb Left	111	1600	0.069 *	6	117	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *
Eb Thru	325	3200	0.129	16	341	0.135	68	409	3200	0.156	0	409	3200	0.156	0	409	3200	0.156	0	409	3200	0.156
Eb Right	87	0	-	4	91	-	0	91	0	-	0	91	0	-	0	91	0	-	0	91	0	-
Wb Left	69	1600	0.043	3	72	0.045	7	79	1600	0.050	0	79	1600	0.050	0	79	1600	0.050	0	79	1600	0.050
Wb Thru	723	3200	0.229 *	36	759	0.241 *	60	819	3200	0.260 *	0	819	3200	0.260 *	0	819	3200	0.260 *	0	819	3200	0.260 *
Wb Right	11	0	-	1	12	-	0	12	0	-	0	12	0	-	0	12	0	-	0	12	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.486			0.508				0.527				0.527				0.527				0.527
LOS			A			A				A				A				A				A

**Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

01:32 PM

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	TTN	Intersection	1
Agency/Co.	LLG	Jurisdiction	Caltrans/City of Malibu
Date Performed	9/4/2013	Analysis Year	Existing
Analysis Time Period	Weekday AM Peak Hour		

Project Description 5-13-0064-1 Broad Beach Restoration Project

East/West Street: Decker Road | North/South Street: Pacific Coast Highway

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	2	645			329	2
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	2	645	0	0	329	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	2	0	0	2	0
Configuration	L	T			T	TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				17	0	6
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	17	0	6
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration					LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LTR	
v (veh/h)	2						23	
C (m) (veh/h)	1240						467	
v/c	0.00						0.05	
95% queue length	0.00						0.15	
Control Delay (s/veh)	7.9						13.1	
LOS	A						B	
Approach Delay (s/veh)	--	--					13.1	
Approach LOS	--	--					B	

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Irvine
San Diego
Woodland Hills

MEMORANDUM

To:	Kenneth A. Ehrlich Elkins Kalt Weintraub Reuben Gartside LLP	Date:	April 3, 2014
From:	David S. Shender, P.E. Corinna M. Gutierrez Linscott, Law & Greenspan, Engineers	LLG Ref:	5-13-0064-1
Subject:	**Traffic and Parking Assessment for the Broad Beach Restoration Project**		

This memorandum has been prepared by Linscott, Law, & Greenspan, Engineers (LLG) to summarize our traffic and parking assessment for the proposed Broad Beach Restoration Project ("the Project") located in the City of Malibu, California. The Project entails the hauling of 600,000 cubic yards of sand to Broad Beach from an off-site quarry to restore the beach and protect it from further erosion. The purpose of the following traffic and parking assessment is to determine traffic operations to and from the site and evaluate potential traffic and parking related impacts.

Project Description

Broad Beach is located in the City of Malibu, approximately two miles east of State Route 23 (SR-23) and north of Zuma Beach. Due to the current erosion of Broad Beach, the Broad Beach Geologic Hazard Abatement District (BBGHAD) has been tasked to restore Broad Beach by hauling approximately 600,000 cubic yards of sand to the beach over a period of six months. Trucks will haul sand from up to three quarries located in the Fillmore, Simi Valley, and Moorpark areas and dump the sand near the north Zuma Beach parking lot (County Lot 12). Lot 12 is located along the south side Pacific Coast Highway (PCH), approximately 1,000 feet east of the Trancas Canyon Road/Pacific Coast Highway intersection. Lot 12 will be temporarily utilized as a staging area and dump site during the six month hauling period, and therefore closed to the general public. The construction period would start no earlier than mid/late September and be completed prior to the following summer peak beach visitation period. The Project site general vicinity and location are shown in ***Figure 1***. The Project site staging area is shown in ***Figure 2***.

Construction Assumptions

The type and number of equipment needs, both on-site and off-site, as well as anticipated number of construction worker trips associated with the hauling phase of the Project have been determined based on information provided by the Project applicant and its consultants. It is estimated that 15 construction workers will be on-site during the hauling phase of the Project. As previously mentioned, it is assumed that hauling would occur over a period of six months. The estimated amount of sand to be imported is approximately 600,000 cubic yards of material. It is anticipated that equipment storage and construction worker parking during the hauling phase will

occur on the Project site, either within the Zuma Beach parking lot staging area or on Broad Beach itself.

Haul trucks are anticipated to travel to the site five days a week (Monday through Friday), 11 hours per day (beginning approximately at 7:00 AM and ending approximately at 6:00 PM). Double trailer bottom dump trucks with a capacity of 20 cubic yards of material carrying 14 cubic yards of sand are planned to be used for the Project. It is estimated that 30 trucks will arrive at and depart the staging area every hour, which is equivalent to approximately 330 trucks per day, or 660 truck *trips* per day (330 inbound trips and 330 outbound trips).

Site Circulation and Temporary Traffic Improvements

As previously noted, Lot 12 will be utilized as a staging area and dumping ground for the imported sand. Currently, vehicular access to Lot 12 is provided by the main primary Zuma Beach internal circulation roadway. However, during construction, it is proposed that this circulation road be closed south of the existing structure located south of Lot 12 to prevent general public access. Thus, to facilitate construction of the Project, vehicular access to the staging area will be provided via two temporary driveways on Pacific Coast Highway. A description of the Project site driveways is provided in the following paragraphs:

- *Inbound PCH Driveway:*
  The inbound PCH project site driveway will be located on the south side of Pacific Coast Highway, at the east end of Lot 12 directly across from Guernsey Avenue. This temporary driveway will serve as an inbound only driveway for Project vehicles and haul trucks. The inbound PCH driveway will accommodate limited vehicular ingress access (i.e., right-turn only ingress turning movements). No outbound turning movements will be permitted from this temporary driveway.

- *Outbound PCH Driveway:*
  The outbound PCH project site driveway will be located on the south side of Pacific Coast Highway, at the west end of Lot 12. This driveway will serve as an outbound only driveway for Project vehicles and haul trucks. The outbound PCH driveway will accommodate full vehicular egress access (i.e., both left-turn and right-turn egress turning movements. No inbound turning movements will be permitted at this driveway.

To facilitate traffic operations into and out of the site, additional temporary traffic improvements are proposed. The Project site circulation and temporary traffic improvements are illustrated in ***Figure 3***.

First, a temporary eastbound right-turn/deceleration paved lane will be installed at the existing Guernsey Avenue/Pacific Coast Highway intersection to ensure that Project truck traffic will safely and efficiently slow to turn right into Lot 12 and not impede eastbound Pacific Coast Highway through traffic. Appropriate temporary signage to be approved by Caltrans will be installed for the right-turn/deceleration lane, and at the inbound driveway to prohibit public vehicular access. For the existing westbound left-turn lane on PCH at Guernsey Avenue, temporary signage will be installed to prohibit westbound left-turns into the inbound PCH driveway. However, since the westbound left-turn lane is used by vehicles to make a U-turn onto eastbound PCH, that maneuver will continue to be accommodated.

Secondly, at the Project's outbound PCH driveway, a temporary traffic signal is proposed to be installed to facilitate the safe and efficient movement of outbound haul trucks onto westbound Pacific Coast Highway. Pedestrian crossings at the temporary signalized intersection will be strictly prohibited through the use of signs. Additionally, temporary signage to be approved by Caltrans will be installed at the intersection to prohibit all turning movements associated with vehicles entering the outbound driveway from PCH.

During nights, weekends, and all other periods when construction activities are not taking place, fences and proper temporary signage approved by Caltrans will be placed at each of the project driveways to prohibit access to the construction site. In order to accommodate and construct these temporary traffic improvements, all required site improvement, signing and striping, traffic signal installation, and traffic control plans associated with the proposed improvements will be prepared and submitted to Caltrans through the Encroachment Permit process.

Upon completion of the Broad Beach Restoration Project, the Zuma Beach Lot 12 parking lot will be restriped and restored to its original condition. Additionally, the right-turn/deceleration lane into the inbound PCH driveway located across from Guernsey Avenue will be removed, including restoration of the existing wall and fence separating PCH from the Lot 12 parking lot. Lastly, the temporary traffic signal and all associated signing and striping at the outbound PCH driveway will be removed, restoring the existing striping and center raised median island to its original condition.

Existing parking along the south shoulder of PCH will need to be prohibited during the period of construction to accommodate the recommended right-turn lane and minimize pedestrian traffic at both Project driveways. As shown on *Figure 3*, the proposed parking prohibition on the south shoulder of PCH generally adjacent to Lot 12 would be implemented in two segments:

- The segment between the proposed inbound driveway opposite Guernsey Avenue and the proposed outbound driveway (a distance of approximately 660 feet); and

- The segment west of the proposed inbound driveway to a point approximately 180 west thereof (to join the existing restricted shoulder parking area on the PCH bridge over Trancas Creek).

As shown on *Figure 3*, the 660-foot segment can accommodate approximately 33 parked cars (assuming 20 feet of shoulder length for each parked car) and the 180-foot shoulder segment can accommodate approximately 9 parked cars, or 42 parked cars in total. This shoulder parking on PCH is generally used by beach visitors, primarily on weekends and in the summer. While the proposed parking prohibition is intended to facilitate the safe and efficient traffic flow of construction-related vehicles, it is noted that Lot 12, the portion of Zuma Beach adjacent to Lot 12, and Broad Beach will be closed to the general public during the Project construction period. Thus, from a pedestrian safety standpoint, it is preferred to prohibit shoulder parking in this area for purposes of discouraging pedestrian traffic adjacent and through the construction area. Also, as approved by Caltrans, temporary signage would be provided along the south side of PCH on both sides of the project area prohibiting pedestrian travel through the construction zone.

Bicycle access will continue to be provided for bicycles traveling on eastbound PCH during the Project construction period. It is noted that there is currently no separate lane for bicycle traffic on eastbound PCH through the project area. The width of the eastbound PCH travel lanes will meet Caltrans standards, in addition to the provision for a standard 4-foot wide paved shoulder through the construction area. "Bicycle Warning" and "Share the Road" signs can be installed along the south side of PCH, as approved by Caltrans, to alert vehicles to the possible presence of bicycles.

Truck Haul Route

The truck haul routes have been determined based on the three quarry locations in the Fillmore, Simi Valley, and Moorpark areas. Each of the truck haul routes approach the Project site from the west via PCH. Note that the Caltrans Truck Networks restricts through traffic on SR-1 PCH, between SR-27 Topanga Canyon Boulevard and SR-23 Decker Road, for 4 or more axle trucks. However, the restriction does not apply to the Project haul trucks because only part of the segment is being utilized for a local delivery of sand to the Project site. The full truck haul routes can be found in ***Figure 4*** and specific routes to PCH from each of the quarries are as follows:

- *Grime Rock Sand Quarry:*
  The Grime Rock Sand Quarry is located at 3500 Grimes Canyon Road in Fillmore, California. Haul trucks will depart from the quarry site going north via Grimes Canyon Road/SR-23 and take Chambersburg Road/SR-23 to westbound Ventura Street/SR-126. Following, the haul trucks will travel southbound to PCH via SR-118, Santa Clara Avenue, Central Avenue, southbound SR-101, and Las Posas Road, successively.

- *P.W. Gillibrand Quarry (2 Alternate Routes):*
  The P.W. Gillibrand Quarry is located at 5000-5599 Bennett Road in Simi Valley, California. For the first alternate route, haul trucks will depart from the quarry site going south on Bennett Road and take Tapo Canyon Road to westbound SR-118. Following, the haul trucks will travel via southbound SR-23 and northbound SR-101 to get to Las Posas Road connecting to PCH.

  For the second alternate route, haul trucks will also depart from the quarry site going south on Bennett Road and take Tapo Canyon Road to westbound SR-118. Following, the haul trucks will travel via southbound SR-23 and northbound SR-101. Finally, haul trucks will travel southbound to PCH via the Pleasant Valley Road/Santa Rosa Road, S. Lewis Road, Hueneme Road, and Las Posas Road, successively.

- *CEMEX Quarry:*
  The CEMEX Quarry is located at 9035 Roseland Avenue in Moorpark, California. Haul trucks will depart from the quarry site going south via Roseland Avenue and take Happy Camp Road, Broadway Road, and Grimes Canyon road, successively, to westbound SR-118. Following, the haul trucks will travel southbound to PCH via Somis Road/SR-34, S. Lewis Road, Hueneme Road, and Las Posas Road, successively.

After the haul trucks are emptied at the Project site, the haul trucks will exit the staging area at the proposed temporary signalized outbound PCH driveway, turning left onto westbound PCH and continuing via the same route in reverse to return to their respective quarry sites. The total round trip distance of the truck haul route is approximately 52 miles for the Grime Rock Sand Quarry, 56 or 55 miles for each of the alternates to the P.W. Gillibrand Quarry, and 39 miles for the CEMEX Quarry.

Emergency Vehicle Access

Emergency vehicle access will continue to be provided to the building located just east of the project staging area. Currently, access to the building is provided from both the east (via Lot 11) and west (via Lot 12). During the hauling period of the Project, the Zuma Beach internal circulation roadway between Lot 11 and Lot 12 (the Project staging area) will be prohibited to the public. However, emergency vehicles will still be able to gain access to the building. Both the proposed inbound PCH driveway and outbound PCH driveway can also be utilized as access points for emergency vehicles during construction of the Project.

Existing Street System

The following intersections are evaluated in this traffic impact assessment for potential traffic impacts due to the Project:

1. Decker Road / Pacific Coast Highway
2. Trancas Canyon Road-Broad Beach Road / Pacific Coast Highway
3. Outbound Project Driveway / Pacific Coast Highway
4. Guernsey Avenue-Inbound Project Driveway / Pacific Coast Highway
5. Heathercliff Road / Pacific Coast Highway
6. Kanan Dume Road / Pacific Coast Highway

The intersections selected for analysis were identified as they are located closest to the Project site, and therefore have the greatest potential to have adverse traffic impacts related to the project. The lane configurations and traffic control devices at the study intersections are provided on ***Figure 5***.

Existing Traffic Volumes

Traffic counts at the four study intersections not adjacent to the project site were obtained from the *Traffic Study for Trancas Country Market*, prepared by Katz, Okitsu & Associates in September 2007. For the intersection of Guernsey Avenue-Inbound Project Driveway/Pacific Coast Highway, manual traffic counts were conducted on Tuesday, August 27, 2013 during the AM and PM peak hours. The

traffic count sheets can be found in ***Appendix A***. Furthermore, the aforementioned intersection counts were extrapolated to determine eastbound and westbound through traffic on Pacific Coast Highway at the Outbound Project Driveway/Pacific Coast Highway intersection. The 2007 and 2013 traffic volumes were then adjusted by a conservative 1% growth factor to obtain the existing baseline for the analysis year 2014 during the AM and PM peak hours. The existing traffic volumes utilized in the traffic impact analysis are illustrated in ***Figure 6***.

Project Trip Generation and Trip Distribution

As previously mentioned, it is estimated that 30 trucks will arrive at and depart the staging area every hour, which is equivalent to approximately 330 trucks per day, or 660 truck *trips* per day (330 inbound trips and 330 outbound trips). To conservatively estimate the equivalent number of vehicles associated with the trucks, a passenger car equivalency factor of 2.0 truck trips was utilized based on standard engineering practice. The use of the 2.0 passenger car equivalent (PCE) in the forecast of construction-related traffic is very conservative ("worst case") as the *Highway Capacity Manual 2010*[1] recommends a lower PCE factor of 1.5 for roadways similar in design to Pacific Coast Highway. Therefore, conservatively assuming 660 truck trips, it is estimated that trucks would generate approximately 1320 passenger car equivalent vehicle trips (i.e., 660 PCE inbound trips and 660 PCE outbound trips) on a daily basis. On a per hour basis, if it is estimated that there are 60 truck trips per hour (i.e., 30 inbound trips and 30 outbound trips), it is conservatively assumed that trucks would generate approximately 120 PCE vehicle trips (i.e., 60 inbound trips and 60 outbound trips) per hour.

Additionally, construction workers are expected to typically arrive at the Project site before 7:00 AM and most will depart after 6:00 PM. Thus, nearly all of the morning arriving construction worker trips and departing evening construction worker trips would occur outside the peak hours of PCH traffic. For example, the peak hour of traffic at the nearby Trancas Canyon Road/Pacific Coast Highway intersection begins at 7:15 AM during the morning commuter period, and begins at 4:15 PM during the afternoon commuter period. However, it was conservatively assumed that all of the inbound and outbound construction worker trips would occur during the AM and PM peak hours. It was also assumed for purposes of trip distribution that half of all construction worker trips would arrive from eastbound Pacific Coast Highway, while the other half of construction worker trips would arrive from westbound Pacific Coast Highway. Therefore, it is estimated that approximately 30 vehicle trips per day (i.e., 15 inbound trips and 15 outbound trips) would be generated by the construction workers during the hauling phase of the Project. During the peak hours, it is

[1] *Highway Capacity Manual 2010,* Transportation Research Board of the National Academy of Sciences, December 2010.

conservatively assumed that all of the construction workers would arrive during the AM peak hour (i.e., 15 inbound trips) and depart during the PM peak hour (i.e., 15 outbound trips).

Taken together, the construction worker vehicles and haul trucks are forecast to generate 1350 PCE vehicle trips per day (675 inbound trips and 675 outbound trips) during the hauling period of the project. During the weekday AM peak hour it is estimated that 135 PCE vehicle trips (75 inbound trips and 60 outbound trips) would be generated. Similarly, it is estimated that 135 PCE vehicle trips (60 inbound trips and 75 outbound trips) would be generated during the weekday PM peak hour. The Project trip generation forecast for the Project is summarized in ***Table 1***. The Project trip distribution for the haul trucks and construction workers is shown in ***Figure 7***. The new forecast traffic volumes associated with the Project are illustrated in ***Figure 8***. The traffic volume assignments presented in *Figure 8* reflects the traffic distribution characteristics shown in *Figure 7* and the traffic generation forecast presented in *Table 1*.

Traffic Impact Analysis

The signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method of analysis that determines Volumes-to-Capacity (*v/c*) ratios on a critical lane basis. The overall intersection *v/c* ratio is subsequently assigned a Level of Service (LOS) value to describe intersection operations. Level of Service varies from LOS A (free flow) to LOS F (jammed condition). The stop-controlled study intersections were evaluated using the Highway Capacity Manual (HCM 2010) methodology which estimates the average control delay for each of the subject movements and determines the LOS for each constrained movement. A description of the ICU and HCM methods and corresponding Level of Service is provided in ***Appendix B***.

Traffic Impact Criteria and Thresholds

The relative impact of the added project traffic volumes to be generated by the Project during the AM and PM peak hours was evaluated based on analysis of existing operating conditions at the six study intersections, without and with the proposed project. The significance of the potential impacts of the project generated traffic was identified using the traffic impact criteria set forth in the City of Malibu's *Traffic Impact Analysis Guidelines*, August, 2012. According to the City's published traffic impact analysis guidelines, the impact is considered significant if the project-related increase in the delay per vehicle or *v/c* ratio equals or exceeds the thresholds or LOS becomes a certain level presented in following tables:

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CITY OF MALIBU SIGNALIZED INTERSECTION IMPACT THRESHOLD CRITERIA		
Pre-Project *v/c*	**Level of Service**	**Project Related Increase in *v/c***
0.71 - 0.80	C	equal to or greater than 0.040
0.81 - 0.90	D	equal to or greater than 0.020
0.91 or more	E or F	equal to or greater than 0.010

CITY OF MALIBU UNSIGNALIZED INTERSECTION IMPACT THRESHOLD CRITERIA	
Project Related Increase in Delay	**Final LOS**
5 or more seconds	Degrades to LOS D or worse

Traffic Impact Analysis Scenarios

The traffic impact study evaluates the potential impacts of the Project for the following impact analysis conditions:

- Existing (Analysis Year 2014)
- Existing + Project

As previously noted, the existing traffic volumes at the study intersections are presented in *Figure 6*. The new project trips as shown on *Figure 8* were then added to the existing traffic volumes to derive the Existing plus Project traffic volumes shown on ***Figure 9***.

Level of Service Calculations

The traffic impact analysis prepared for the study intersections using ICU/HCM methodologies and application of the City of Malibu's significant impact criteria is summarized in ***Table 2***. The calculation worksheets are attached to this memorandum in *Appendix B.*

As indicated in column [2] of *Table 2* under "Existing Year 2014" conditions, all except one of the study intersections are operating at LOS D or better during both the AM and PM peak hours. The intersection of Kanan Dume Road/Pacific Coast Highway is operating at LOS E during the PM peak hour under existing conditions.

As indicated in column [3] of *Table* 2, application of the City's threshold criteria to the "Existing Year 2014 With Project" scenario indicates that the forecast changes in delay and *v/c* ratios at the study intersections due to Project-related traffic are forecast to be below the City's significance thresholds. Therefore, the traffic impacts of the Project in the Existing Plus Project condition will be less than significant for all the study intersections.

Queuing Analysis

An operational queuing analysis was also conducted to evaluate the potential queue of haul trucks exiting the staging area's outbound PCH driveway at the proposed temporary traffic signal. The estimated queue was determined using procedures outlined in the Highway Capacity Manual. The HCM back-of-queue calculation worksheets are contained in *Appendix B*. The potential queues for the staging area driveway are summarized in the following table:

Table 3
BACK-OF-QUEUE SUMMARY
STAGING AREA DRIVEWAY

Peak Hour	Average Queue (veh/lane)	95th Percentile Queue (veh/lane)
AM	0.8	1.4
PM	0.9	1.5

As noted above, the table reports the average queue expected during the AM and PM peak hours, as well as the 95th percentile queue. The 95th percentile queue essentially represents the highest queue that would be expected during the peak hour. As seen in the table above, the highest 95th percentile queue occurs during the PM peak hour for both options, with a 95th percentile queue ranging from 1.4 to 1.5 PCE, which is equivalent to approximately one truck length as discussed previously in the estimated truck trip generation section of this memorandum. Thus, the queue of vehicles exiting the staging area will be nominal and will not impact operations within the site.

Highway Segment Analysis

A highway segment analysis was prepared for the two-lane conventional highway segment of Pacific Coast Highway between Las Posas to Yerba Buena. The other segments of PCH within the Project study area are four-lane conventional highway segments with signalized intersections at major cross streets. The LOS of the four-lane segments is dependent on the LOS of the signalized cross streets as seen in the previous traffic impact analysis.

Traffic Volumes

Peak hour volumes on the PCH segment between Las Posas and Yerba Buena were obtained from Caltrans for year 2012 (the latest data available). Furthermore, the volumes were adjusted by a conservative 1% growth factor for the existing analysis year 2014. The added Project traffic volumes conservatively account for the haul trucks and construction workers during the peak hours. The following table depicts the peak hour volumes on the study segment of Pacific Coast Highway without and with the Project:

Table 4
EXISTING AND EXISTING+PROJECT PEAK HOUR TRAFFIC VOLUMES

PCH Segment	Existing	Project	Existing + Project
Las Posas to Yerba Buena	1173	135	1308

Level of Service

Note that the PCH segment between Las Posas to Yerba Buena also includes a passing lane segment with a separate LOS. The Level of Service calculations sheets are attached to this memorandum in ***Appendix C***. The following table shows the LOS of the 2-lane highway and passing lane segments:

Table 5
LEVEL OF SERVICE OF PCH SEGMENT BETWEEN LAS POSAS TO YERBA BUENA

Scenario	2-Lane Highway Segment	Passing Lane Segment
Existing	D	B
Existing + Project	D	B

Neither the LOS for the 2-lane highway nor passing lane segments changes with the added project traffic volumes on the PCH segment between Las Posas and Yerba Buena.

Other Affected Roadways

As noted above, the Project will result in less than significant traffic impacts at intersections and street segments along Pacific Coast Highway closest to the site. Beyond the study area, vehicle trips generated by the Project will disperse and therefore the adverse effects will further diminish. Thus, it is reasonable to conclude that traffic impacts on roadways beyond the study area will also be less than significant. The paragraphs below provide a brief description of these other affected roadways.

- Las Posas Road/PCH Interchange – The Las Posas Road/PCH interchange is located approximately 15 miles northwest of the Project. At this location, Project-related trips will diverge, with many construction-worker trips expected to continue north to/from Oxnard with trucks using Las Posas Road travelling to and from the quarry sites. The Las Posas Road interchange features two stop-controlled intersections on Las Posas Road with freeway-type ramps to and from PCH: for southbound Las Posas vehicles, a left-turn is required to access southbound PCH while for northbound PCH vehicles, a right-turn is required onto northbound Las Posas Road. Field reviews indicate that both of these movements operate with little or no delay for motorists. Thus, Project-related vehicles (approximately one truck every two minutes in each direction) are not expected to adversely impact current traffic operations at the interchange.

- Las Posas Road – Las Posas Road primarily provides one travel lane in each direction, similar to the two-lane segment of PCH analyzed herein (for which no significant traffic impacts were identified due to the Project). South of Pleasant Valley Road, the surrounding land uses are primarily agricultural in nature, which includes cars, as well as occasional truck trips serving farms in the area. Thus, the additional Project-related vehicles (approximately one truck every two minutes in each direction) would not adversely change the character or use of Las Posas Road. North of Pleasant Valley Road, additional travel lanes are provided on Las Posas Road, which would readily accommodate the limited additional trips generated by the Project.

- Lewis Road, SR-101, SR-34, SR-118, and Other External Travel Routes - As shown in *Figure 4*, the expected truck trips north of the Las Posas Road/Lewis Road intersection will further disperse among the multiple routes to be used to access the three sand source quarries. Accordingly, the traffic effects of the Project on these other travel routes external to the Project site would be de minimis.

Parking Assessment

A parking assessment was performed to measure the effect of the Project on the Zuma County Beach parking lots, as well as on-street parking on Pacific Coast Highway. According to the County of Los Angeles Department of Beaches and Harbors, there are approximately 2,025 off-street parking spaces within the entire Zuma County Beach, split across 12 adjacent parking lots. An overview plan of the parking lots is shown in ***Figure 10***. Parking Lot 12, which will be utilized as the Project's staging area, contains approximately 260 parking spaces. Also, as previously noted, in addition to the temporary prohibition of parking during construction in Lot 12, shoulder parking on PCH adjacent to Lot 12 for approximately 42 vehicles will be temporarily removed to accommodate the proposed temporary traffic improvements associated with facilitating Project-related construction vehicles in and out of the staging area.

Parking Utilization and Demand

Daily parking counts (i.e., ticket sales) were obtained from the County of Los Angeles Department of Beaches and Harbors from September 2012 through May 2013 and can be found in ***Appendix Table D-1***. The parking utilization[2] during the non-summer months is shown in ***Appendix Table D-2*** and ***Appendix Figure D-1.*** As shown in the tables and figure, the number of cars counted (ticket sales) exceeds the number of spaces available on only three occasions which correspond to two major holiday weekends (e.g., Labor Day Weekend and Memorial Day Weekend). During the rest of the non-summer months, the parking supply exceeds parking ticket sales an average of 1,587 parking spaces.

Table 6 below provides a summary of the highest monthly parking utilization recorded at the County's Zuma Beach parking lots during the September 2012 – May 2013 period (excluding Labor Day Weekend and Memorial Day Weekend as Project construction will not overlap with these periods). Also shown in *Table 6* is the available surplus parking supply during these non-summer months.

[2] The use of the County's Zuma Beach ticket sale data for parking utilization estimates is highly conservative ("worst case") as it assumes all vehicles paying for parking in a single day are on-site simultaneously. In reality, there is some turnover and some visitors arrive later in the day after other vehicles have left the County parking lot.

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Table 6 ZUMA BEACH PARKING LOT UTILIZATION		
Month	**Highest Parking Utilization [a]**	**Available Surplus Parking Supply [b]**
September	1560	205
October	341	1424
November	1406	359
December	1312	453
January	327	1438
February	597	1168
March	1047	718
April	648	1117
May	954	811
[a] Based on parking lot ticket sales; Excludes Labor Day Weekend and Memorial Day Weekend as Project construction will not occur during these periods. [b] Based on an available supply of 1,765 spaces within the County's Zuma Beach parking lots excluding Lot 12.		

As shown in *Table 6*, there will be a surplus of parking, even considering the temporary loss of the Lot 12 parking spaces during non-summer months to accommodate construction of the Project. Additionally, should motorists who may otherwise park on the shoulder of PCH adjacent to Lot 12 choose to park at the County Zuma Beach parking lots, the temporary loss of approximately 42 on-street parking spaces can readily be accommodated based on the substantial parking surplus within the County lot during the construction period.

Summary

The traffic and parking assessment was conducted for the proposed Broad Beach Restoration Project located in the City of Malibu. The Project entails the hauling of sand to Broad Beach from an off-site quarry in order to restore the beach and protect it from further erosion. The traffic and parking assessment yields the following results:

- The Project is expected to generate 1350 PCE (passenger car equivalent vehicle) trips per day (675 inbound trips and 675 outbound trips) during the hauling period of the project. Also, the weekday AM peak hour it is estimated

that 135 PCE vehicle trips (75 inbound trips and 60 outbound trips) would be generated and 135 PCE vehicle trips (60 inbound trips and 75 outbound trips) during the PM peak hour. The traffic impacts of the construction operations produce less than significant impacts on the study intersections based on the City of Malibu thresholds.

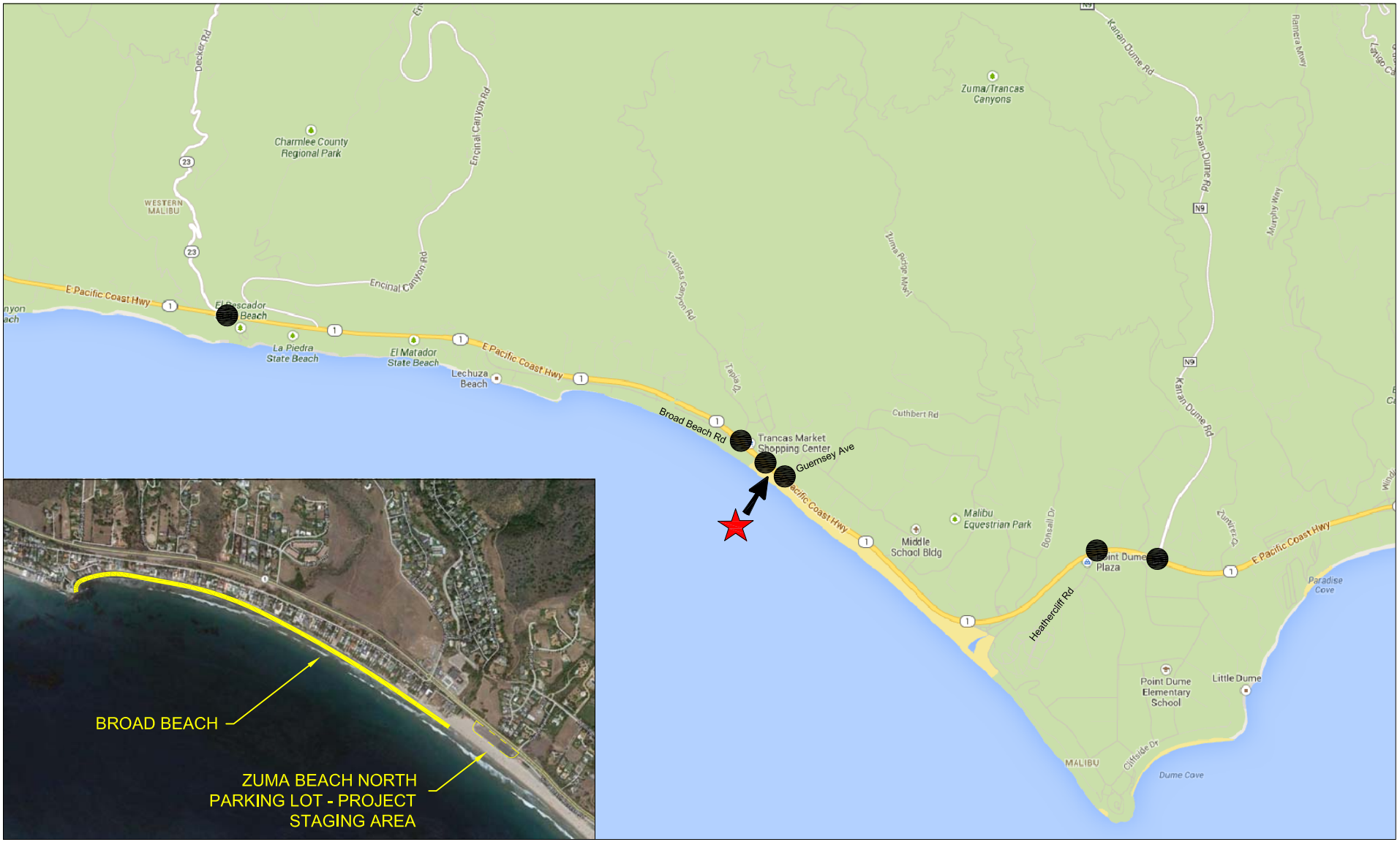
- Queuing for traffic within the Project staging area is nominal at the outbound PCH driveway. Proposed traffic signal and construction operations are not expected to be impacted.

- The Project added traffic volumes will result in less than significant traffic impacts at street segments along Pacific Coast Highway closest to the site and roadways beyond the study area.

- The Project will result in the temporary loss of the 260 public parking spaces located in Lot 12 of the County's Zuma Beach parking lot, which has an overall supply of 2,025 parking spaces. In addition, shoulder parking on PCH for approximately 42 vehicles adjacent to Lot 12 will be prohibited during the construction period. The unaffected parking supply at the Zuma County Beach will be adequate during the construction of the Project to accommodate any vehicles who utilize Lot 12 or the shoulder parking affected by the Project.

Please feel free to call us with any questions or comments regarding this traffic and parking assessment for the proposed Broad Beach Restoration Project.

cc: Chris Webb, Moffatt & Nichol
File



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MAP SOURCE: GOOGLE MAPS

PROJECT STAGING AREA

STUDY INTERSECTIONS

FIGURE 1
VICINITY MAP

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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MAP SOURCE: GOOGLE EARTH

FIGURE 2

PROJECT STAGING AREA AND PROPOSED DRIVEWAY LOCATIONS

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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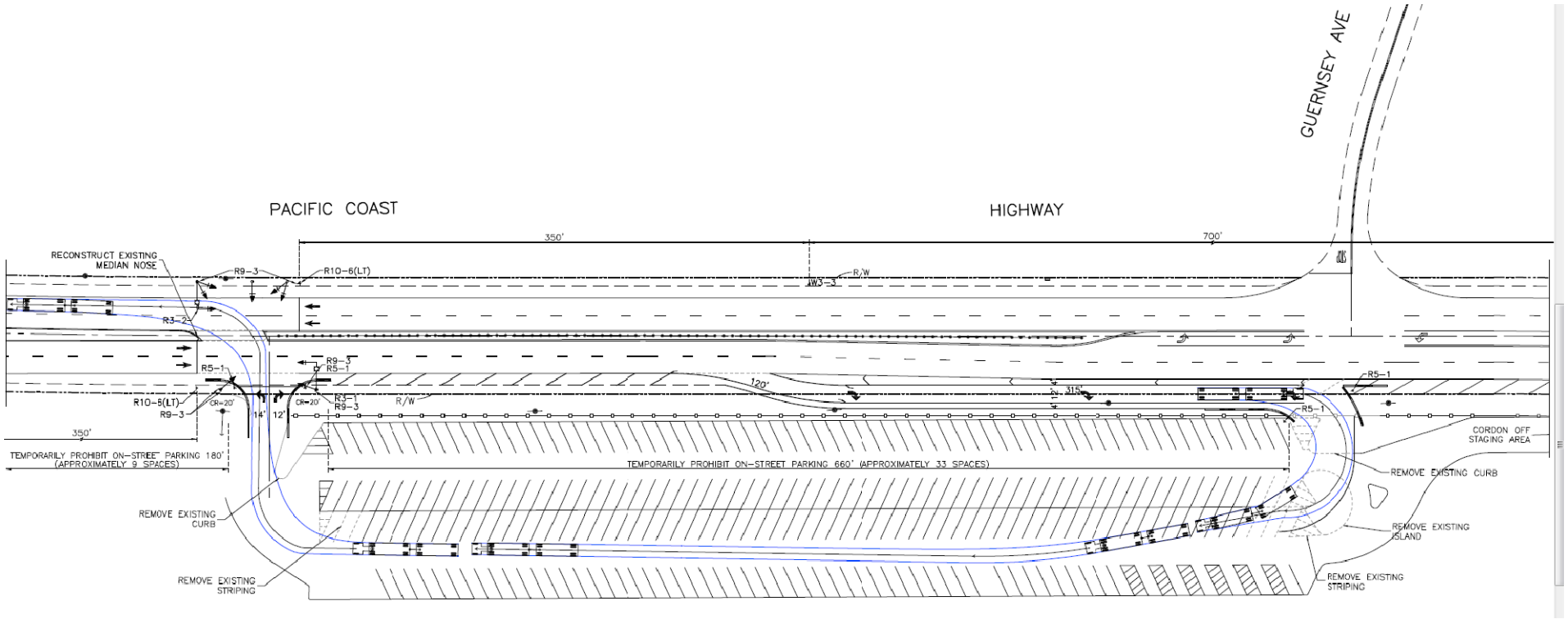

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SOURCE: LINSCOTT, LAW & GREENSPAN, engineers

FIGURE 3
PROJECT SITE CIRCULATION PLAN

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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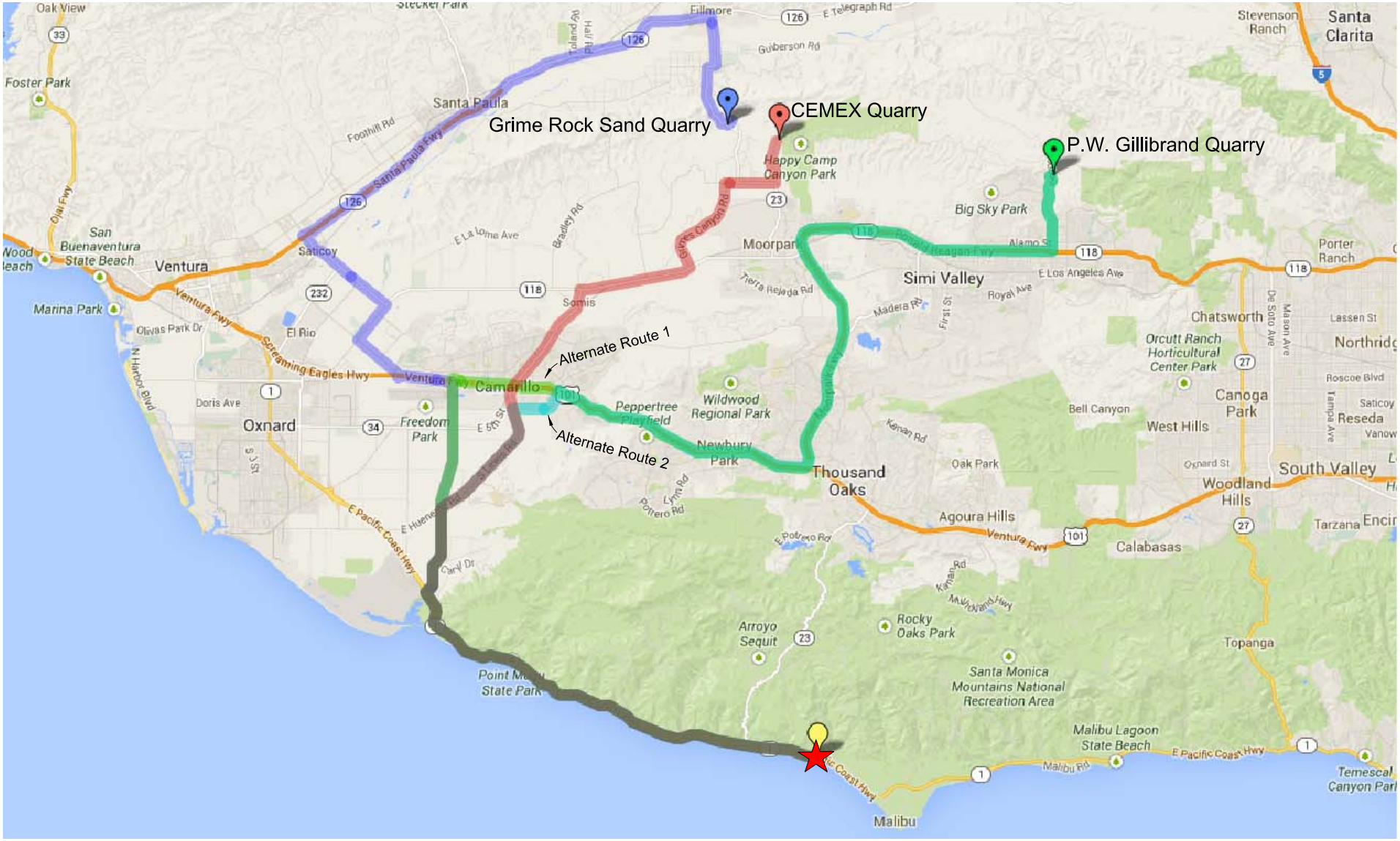

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MAP SOURCE: GOOGLE MAPS

★ PROJECT STAGING AREA

FIGURE 4
TRUCK HAUL ROUTES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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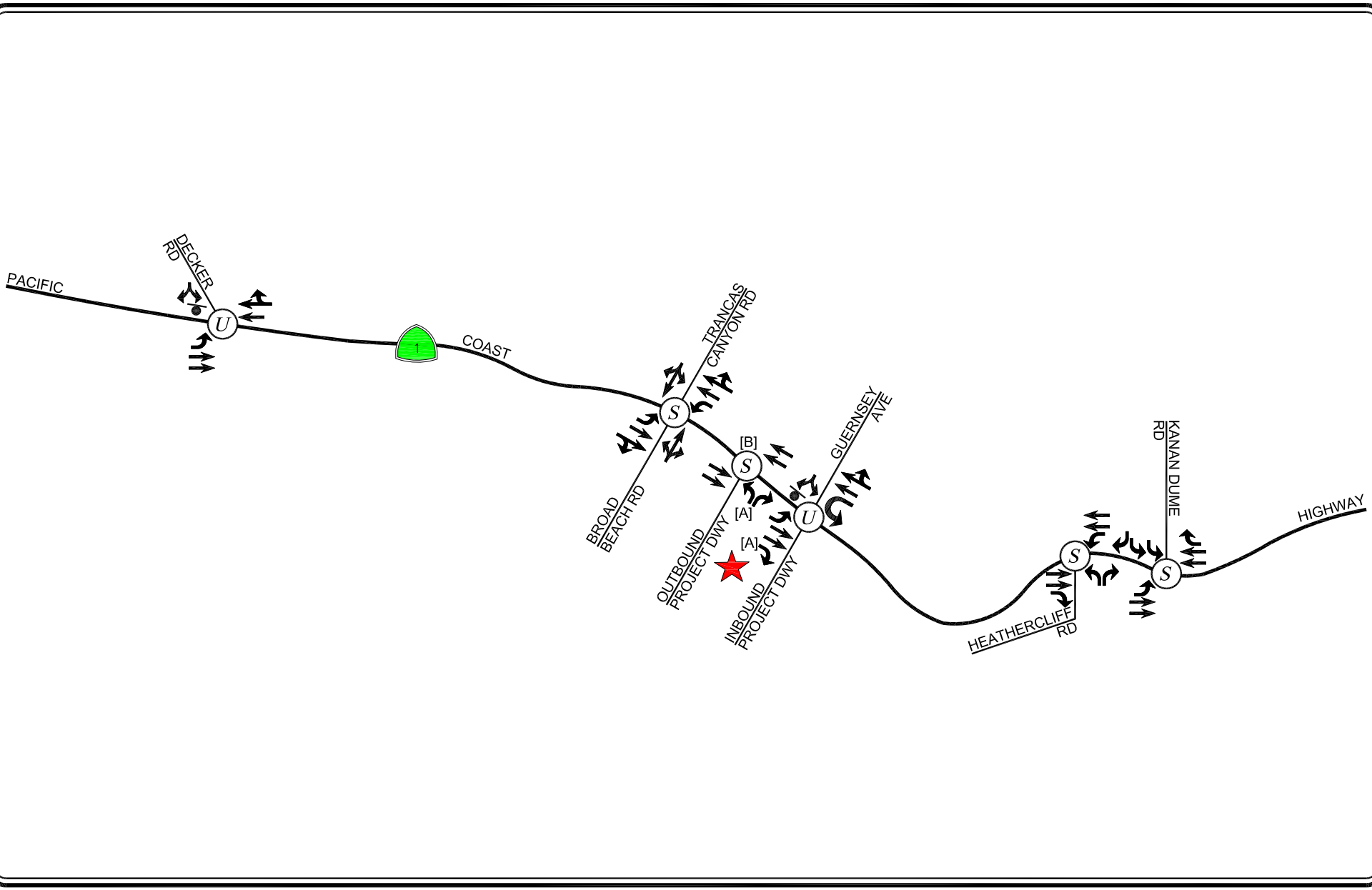

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PROJECT STAGING AREA

[A] = PROJECT MOVEMENT ONLY

[B] = TEMPORARY PROJECT TRAFFIC SIGNAL

U = UNSIGNALIZED INTERSECTION

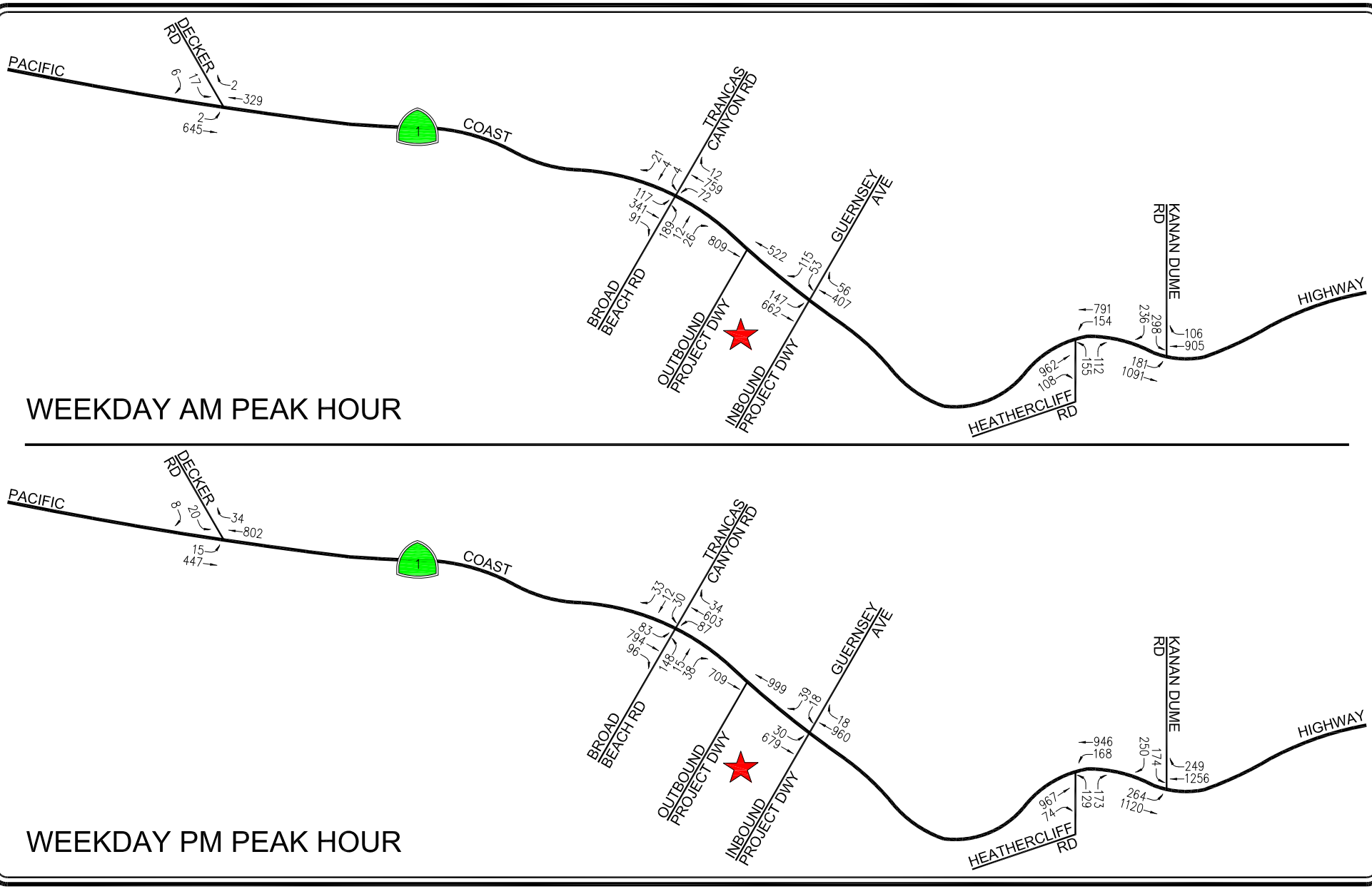
= STOP SIGN

S = SIGNALIZED INTERSECTION

FIGURE 5
LANE CONFIGURATIONS

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT



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PROJECT STAGING AREA

FIGURE 6
EXISTING TRAFFIC VOLUMES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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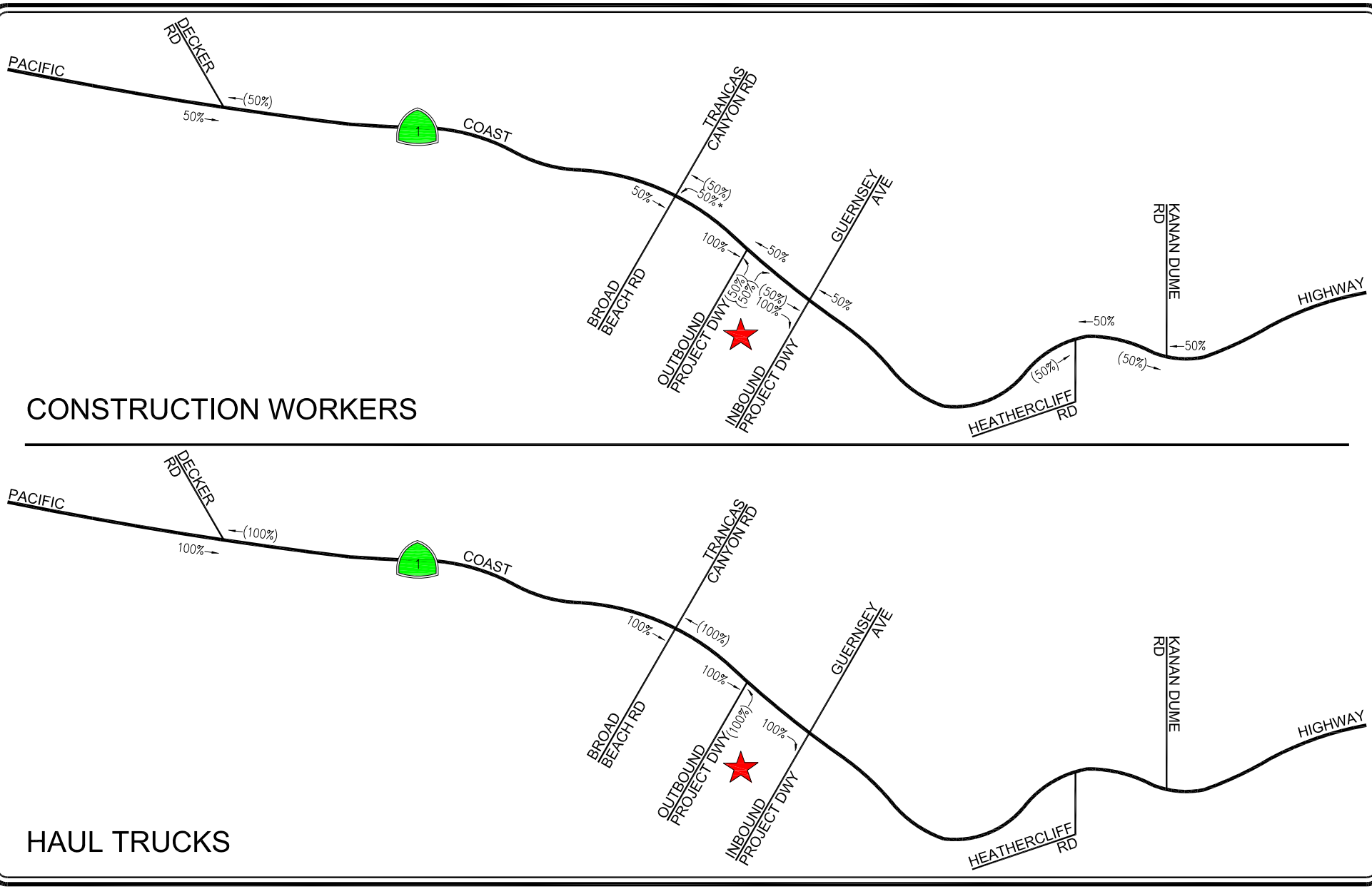

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★ PROJECT STAGING AREA

XX = INBOUND PERCENTAGES

(XX) = OUTBOUND PERCENTAGES

* = PROJECT U-TURN TRAFFIC

FIGURE 7
PROJECT TRIP DISTRIBUTION

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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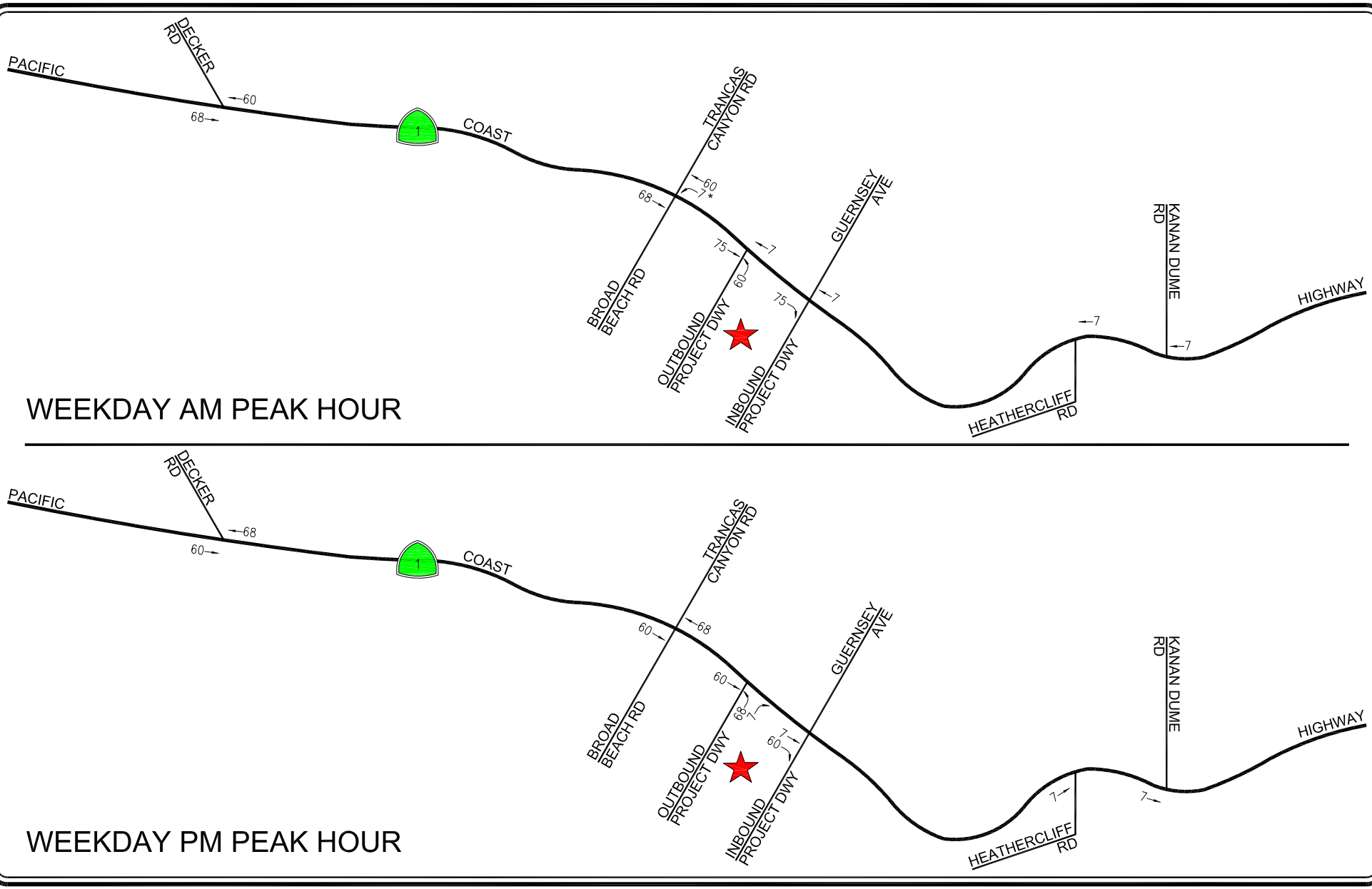

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NOTE: PROJECT TRUCK TRIPS EXPRESSED IN PASSENGER CAR EQUIVALENTS

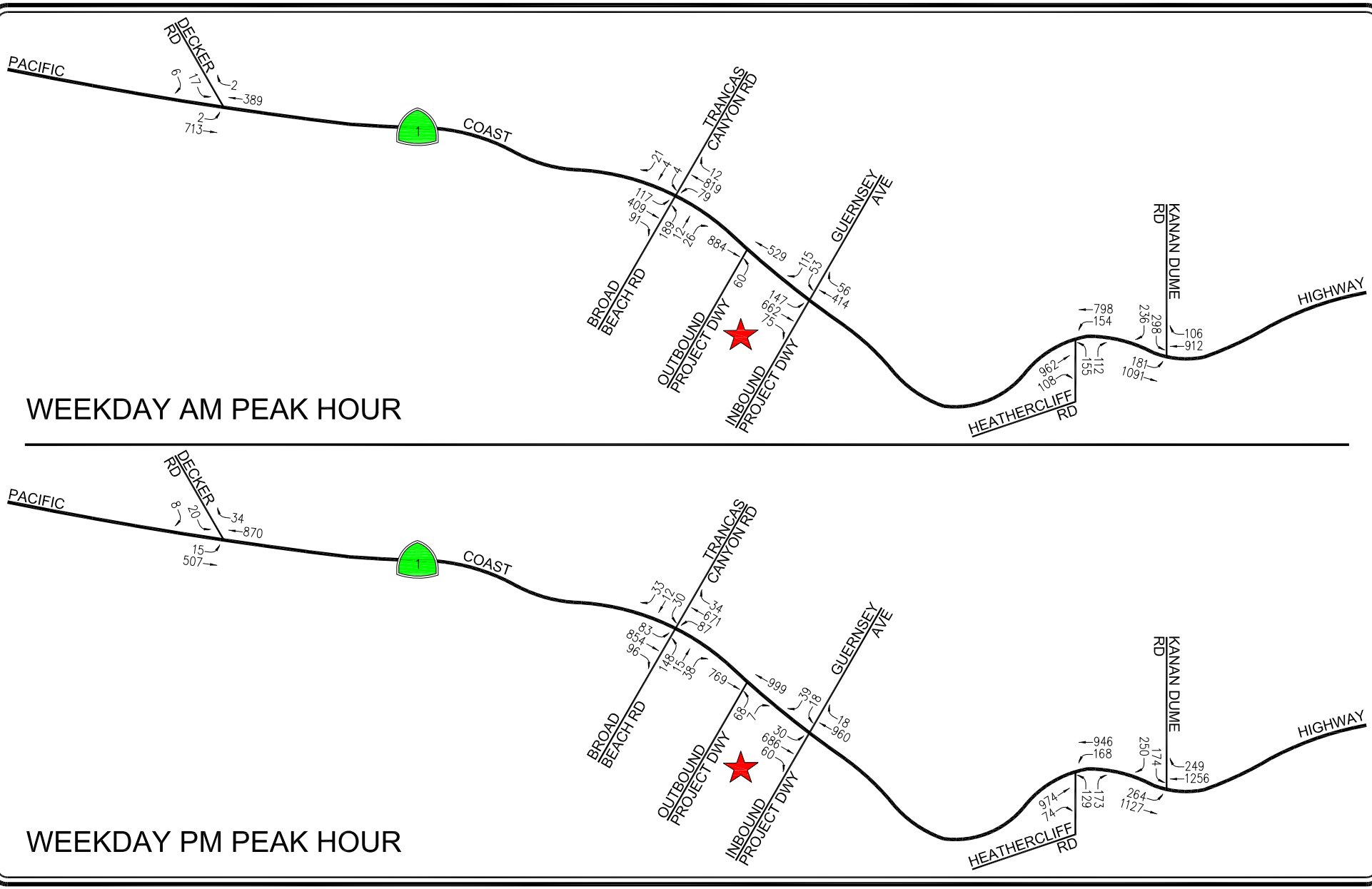
PROJECT STAGING AREA

* = PROJECT U-TURN TRAFFIC

FIGURE 8
PROJECT ONLY TRAFFIC VOLUMES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT



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NOTE: PROJECT TRUCK TRIPS EXPRESSED IN PASSENGER CAR EQUIVALENTS

PROJECT STAGING AREA

FIGURE 9
EXISTING WITH PROJECT TRAFFIC VOLUMES

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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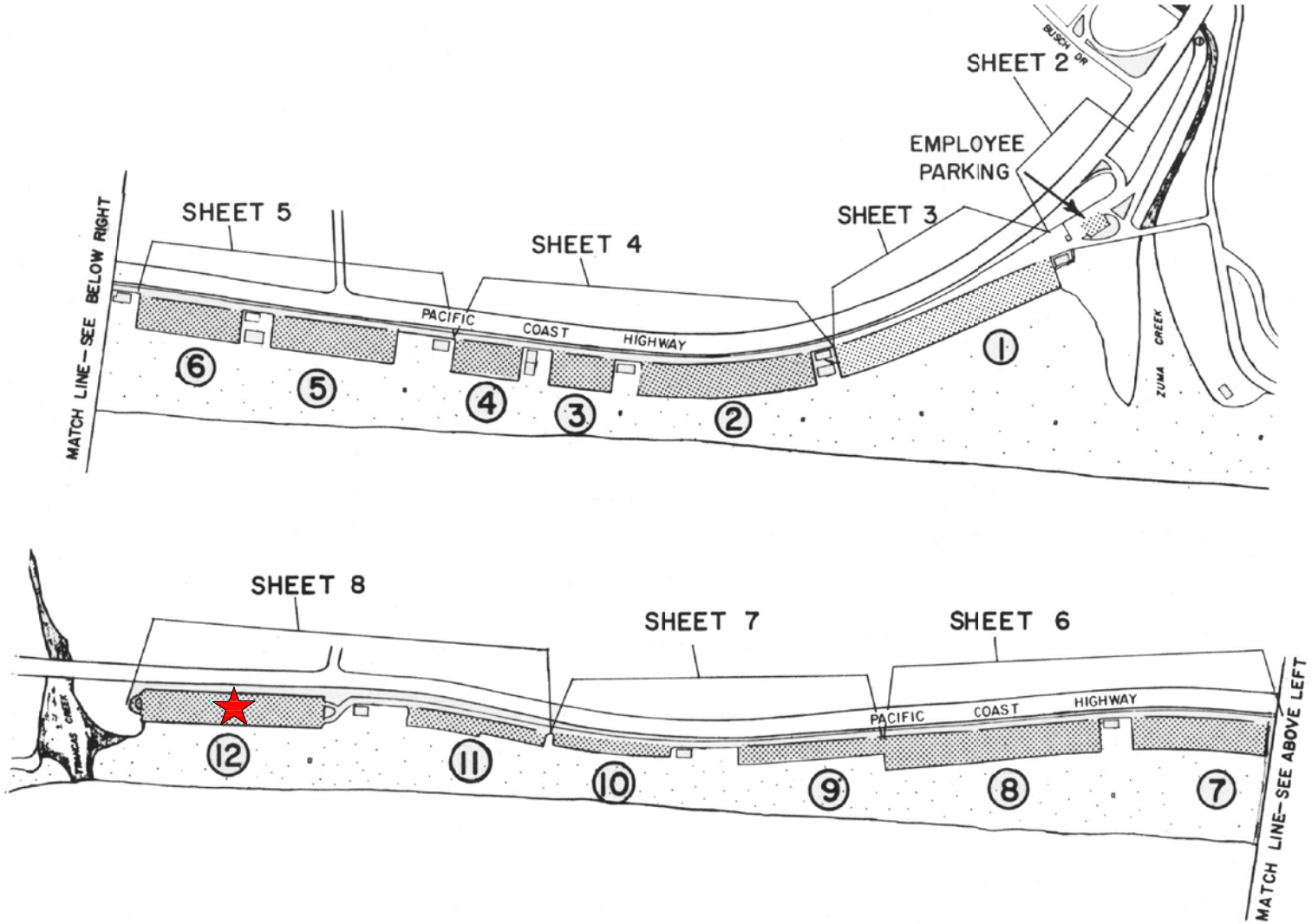

L.A. COUNTY DEPARTMENT OF BEACHES AND HARBORS Revised 5 / 2002 by CLS

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MAP SOURCE: COUNTY OF LOS ANGELES DEPARTMENT OF BEACHES AND HARBORS

★ PROJECT STAGING AREA

FIGURE 10
ZUMA COUNTY BEACH PARKING

LINSCOTT, LAW & GREENSPAN, engineers

BROAD BEACH RESTORATION PROJECT

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Table 1
PROJECT TRIP GENERATION [1]

10-Oct-13

LAND USE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Proposed Project							
Construction Workers [3]	30	15	0	15	0	15	15
Total Haul Trucks							
6-Axle (2.0 PCE) [4]	1,320	60	60	120	60	60	120
NET INCREASE	**1,350**	**75**	**60**	**135**	**60**	**75**	**135**

[1] Source: Moffatt & Nichol.
[2] Trips are one-way traffic movements, entering or leaving.
[3] Of the peak daily trip generation associated with construction workers, it is conservatively estimated that all morning construction worker trips would occur during the weekday AM peak hour and all evening construction worker trips would occur during the weekday PM peak hour.
[4] A Passenger Car Equivalent (PCE) factor of 2.0 was applied to all trucks based on standard traffic engineering practice to conservatively estimate the equivalent number of vehicles associated with the trucks.

Table 2
SUMMARY OF VOLUME TO CAPACITY RATIOS, DELAYS, AND LEVELS OF SERVICE [a]
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	PEAK HOUR	[2] EXISTING YEAR 2014 DELAY OR V/C [b]	LOS	[3] EXISTING YEAR 2014 W/ PROJECT DELAY OR V/C [b]	LOS	CHANGE V/C [(3)-(2)] [c][d]	SIGNIF. IMPACT
1	Decker Road / Pacific Coast Highway	AM	13.1	B	14.2	B	2	NO
		PM	20.3	C	22.7	C	3	NO
2	Trancas Canyon Road - Broad Beach Road / Pacific Coast Highway	AM	0.508	A	0.527	A	0.019	NO
		PM	0.527	A	0.546	A	0.019	NO
3	Outbound Project Driveway / Pacific Coast Highway [e]	AM	-	-	0.364	A	-	-
		PM	-	-	0.405	A	-	-
4	Guernsey Avenue - Inbound Project Driveway / Pacific Coast Highway	AM	20.1	C	20.4	C	1	NO
		PM	20.9	C	20.9	C	0	NO
5	Heathercliff Road / Pacific Coast Highway	AM	0.544	A	0.544	A	0.000	NO
		PM	0.565	A	0.568	A	0.003	NO
6	Kanan Dume Road / Pacific Coast Highway	AM	0.813	D	0.815	D	0.002	NO
		PM	0.950	E	0.950	E	0.000	NO

[a] Intersection analysis based on the Intersection Capacity Utilization method for signalized intersections and the Highway Capacity Manual 2010 methodology for unsignalized intersections.

[b] Delay reported in seconds per vehicle.

[c] City of Malibu signalized intersection impact threshold criteria is as follows:

Pre-Project v/c	LOS	Project-Related Increase in V/C
0.71 - 0.80	C	equal to or greater than 0.040
0.81 - 0.90	D	equal to or greater than 0.020
0.91 or more	E / F	equal to or greater than 0.010

[d] City of Malibu unsignalized intersection impact threshold criteria is as follows:

Project Related Increase in delay
5 or more seconds
Final LOS
Degrades to level D or worse

[e] Intersection Outbound Project Driveway/Pacific Coast Highway does not exist in Existing Year 2014

APPENDIX A

TRAFFIC COUNT DATA

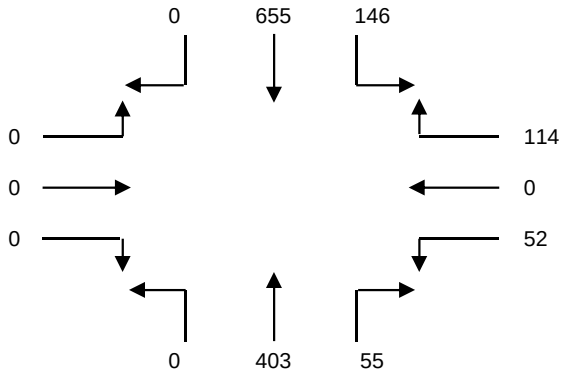
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: LLG - WOODLAND HILLS
PROJECT: BROAD BEACH - CITY OF MALIBU
DATE: TUESDAY, AUGUST 27, 2013
PERIOD: 07:00 AM TO 09:00 AM
INTERSECTION N/S PACIFIC COAST HIGHWAY
E/W GUERNSEY AVENUE
FILE NUMBER: 1-AM

15 MINUTE	1	2	3	4	5	6	7	8	9	10	11	12
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT
0700-0715	0	133	9	2	0	4	2	99	0	0	0	0
0715-0730	0	177	9	5	0	2	1	81	0	0	0	0
0730-0745	0	153	13	13	0	2	1	85	0	0	0	0
0745-0800	0	171	66	27	0	4	14	87	0	0	0	0
0800-0815	0	161	49	47	0	27	25	105	0	0	0	0
0815-0830	0	185	21	23	0	13	10	110	0	0	0	0
0830-0845	0	138	10	17	0	8	6	101	0	0	0	0
0845-0900	0	132	6	7	0	5	4	89	0	0	0	0

1 HOUR	1	2	3	4	5	6	7	8	9	10	11	12	
TOTALS	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTALS
0700-0800	0	634	97	47	0	12	18	352	0	0	0	0	1160
0715-0815	0	662	137	92	0	35	41	358	0	0	0	0	1325
0730-0830	0	670	149	110	0	46	50	387	0	0	0	0	1412
0745-0845	0	655	146	114	0	52	55	403	0	0	0	0	1425
0800-0900	0	616	86	94	0	53	45	405	0	0	0	0	1299

A.M. PEAK HOUR
0745-0845



PACIFIC COAST HIGHWAY

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.448.7978 PHONE
626.448.2877 FAX

City Traffic Counters
(626) 256-4171

File Name : Decker1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 1

Groups Printed- Unshifted

	PCH Southbound			Decker Cyn Rd Westbound			PCH Northbound			Decker Cyn Rd Eastbound			
Start Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	155	0	1	0	1	0	71	0	0	0	0	228
07:15 AM	2	151	0	2	0	1	0	67	0	0	0	0	223
07:30 AM	0	134	1	8	0	3	4	101	2	0	0	0	253
07:45 AM	0	140	2	4	0	1	3	61	0	2	0	1	214
Total	2	580	3	15	0	6	7	300	2	2	0	1	918
08:00 AM	0	138	1	11	0	6	1	60	1	3	0	1	222
08:15 AM	0	138	1	2	0	0	1	66	0	0	0	1	209
08:30 AM	0	106	0	3	0	2	2	66	1	1	0	2	183
08:45 AM	2	116	2	7	0	4	1	70	4	1	0	1	208
Total	2	498	4	23	0	12	5	262	6	5	0	5	822
04:00 PM	2	87	0	4	0	4	0	170	4	0	0	1	272
04:15 PM	7	92	0	1	0	2	0	171	8	0	0	0	281
04:30 PM	2	108	0	9	0	2	0	191	6	1	0	0	319
04:45 PM	3	80	0	9	0	3	0	153	11	0	0	0	259
Total	14	367	0	23	0	11	0	685	29	1	0	1	1131
05:00 PM	2	103	0	5	0	0	0	158	3	0	0	0	271
05:15 PM	5	95	0	6	0	3	0	188	12	0	0	0	309
05:30 PM	2	95	0	3	0	4	0	199	4	0	0	0	307
05:45 PM	5	99	0	3	0	1	0	161	11	0	0	0	280
Total	14	392	0	17	0	8	0	706	30	0	0	0	1167
Grand Total	32	1837	7	78	0	37	12	1953	67	8	0	7	4038
Apprch %	1.7	97.9	0.4	67.8	0.0	32.2	0.6	96.1	3.3	53.3	0.0	46.7	
Total %	0.8	45.5	0.2	1.9	0.0	0.9	0.3	48.4	1.7	0.2	0.0	0.2	

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File Name : Decker1
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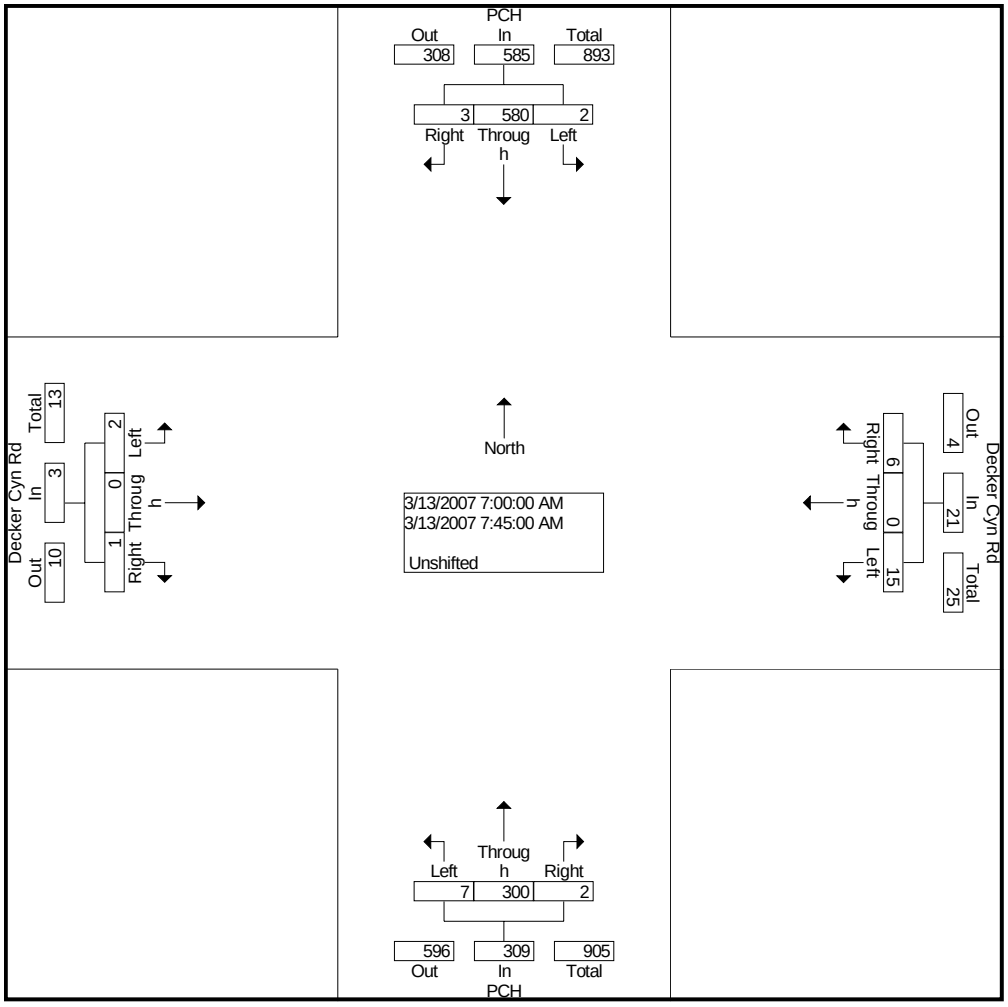
	PCH Southbound				Decker Cyn Rd Westbound				PCH Northbound				Decker Cyn Rd Eastbound				
Start Time	Left	Through	Right	App. Total	Left	Through	Right	App. Total	Left	Through	Right	App. Total	Left	Through	Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:00 AM																
Volume	2	580	3	585	15	0	6	21	7	300	2	309	2	0	1	3	918
Percent	0.3	99.1	0.5		71.4	0.0	28.6		2.3	97.1	0.6		66.7	0.0	33.3		
07:30 Volume	0	134	1	135	8	0	3	11	4	101	2	107	0	0	0	0	253
Peak Factor																	0.907
High Int.	07:00 AM				07:30 AM				07:30 AM				07:45 AM				
Volume	0	155	0	155	8	0	3	11	4	101	2	107	2	0	1	3	
Peak Factor				0.944				0.477				0.722				0.250	



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File Name : Decker1
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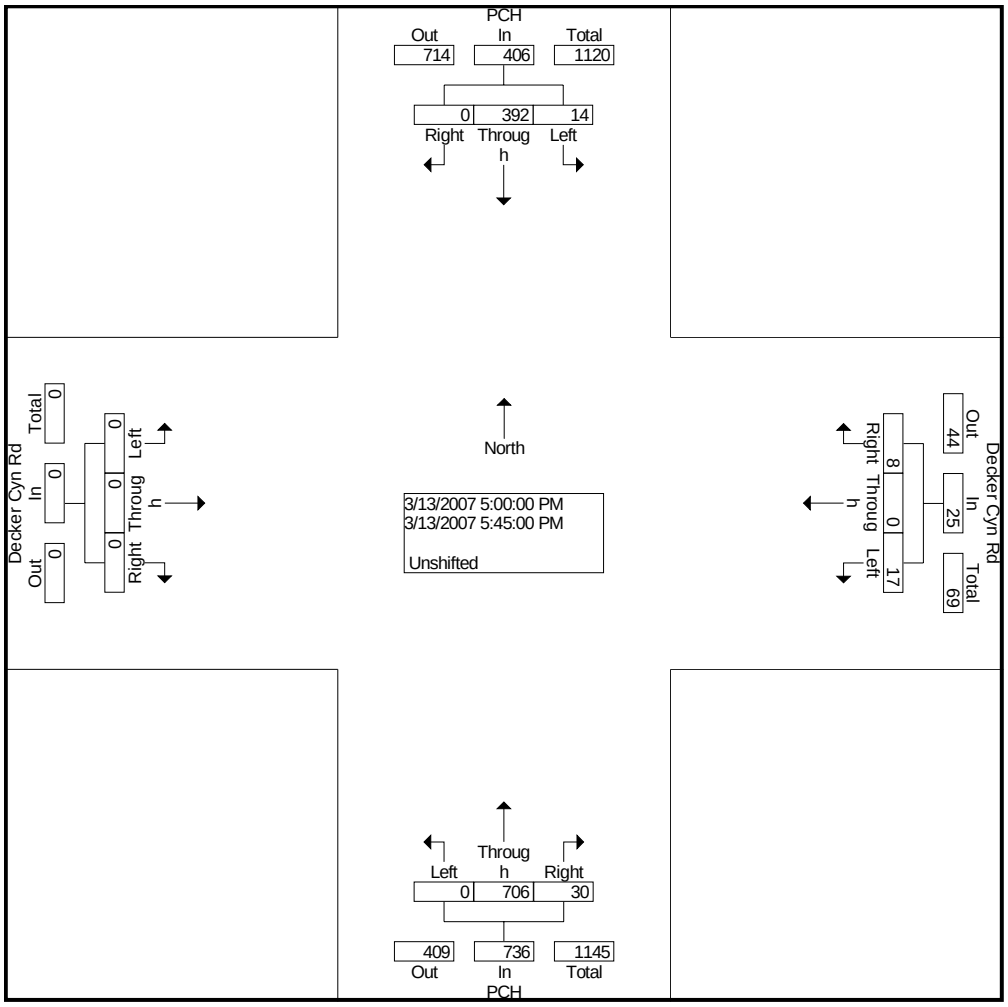
	PCH Southbound				Decker Cyn Rd Westbound				PCH Northbound				Decker Cyn Rd Eastbound				
Start Time	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	14	392	0	406	17	0	8	25	0	706	30	736	0	0	0	0	1167
Percent	3.4	96.6	0.0		68.0	0.0	32.0		0.0	95.9	4.1		0.0	0.0	0.0		
05:15 Volume	5	95	0	100	6	0	3	9	0	188	12	200	0	0	0	0	309
Peak Factor																	0.944
High Int.	05:00 PM				05:15 PM				05:30 PM								
Volume	2	103	0	105	6	0	3	9	0	199	4	203					
Peak Factor				0.967				0.694				0.906					



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Trancas Canyon Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	2	1	1	2	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	14	0	5	1	1	3	19	54	16	17	135	1	266
7:15 AM	20	3	13	0	0	1	20	73	16	18	163	0	327
7:30 AM	28	2	2	0	2	2	23	65	17	12	190	0	343
7:45 AM	65	1	3	0	0	5	31	97	27	14	195	0	438
8:00 AM	62	5	6	0	2	10	25	69	24	19	151	1	374
8:15 AM	48	7	7	1	1	5	26	88	13	16	103	1	316
8:30 AM	40	2	3	1	2	6	31	93	19	14	124	1	336
8:45 AM	43	5	2	0	2	2	28	94	14	16	140	1	347
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													
TOTAL VOLUMES =	NL 320	NT 25	NR 41	SL 3	ST 10	SR 34	EL 203	ET 633	ER 146	WL 126	WT 1201	WR 5	TOTAL 2747

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	175	11	24	0	4	18	99	304	84	63	699	1	1482
PEAK HR. FACTOR:		0.719			0.458			0.785			0.913		0.846

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Trancas Canyon Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	2	1	1	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	35	1	12	0	0	9	13	108	23	11	123	3	338
4:15 PM	39	5	14	3	3	7	9	173	16	13	144	1	427
4:30 PM	22	2	8	5	7	7	16	204	13	13	171	7	475
4:45 PM	40	5	6	3	1	4	16	157	30	15	106	0	383
5:00 PM	36	2	7	1	0	5	14	194	29	19	101	0	408
5:15 PM	34	1	15	0	2	4	10	193	25	16	106	0	406
5:30 PM	46	2	11	0	2	7	18	181	26	18	114	2	427
5:45 PM	45	5	8	0	0	4	20	167	27	18	81	1	376
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	297	23	81	12	15	47	116	1377	189	123	946	14	3240

PM Peak Hr Begins at: 415 PM

PEAK VOLUMES =	137	14	35	12	11	23	55	728	88	60	522	8	1693
PEAK HR. FACTOR:		0.802			0.605			0.919			0.772		0.891

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Heathercliff Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0	1					2	1	1	2		
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	9		28					181	14	28	129		389
7:15 AM	26		19					187	12	30	162		436
7:30 AM	49		29					201	15	31	253		578
7:45 AM	45		21					208	54	42	177		547
8:00 AM	24		35					280	19	40	111		509
8:15 AM	19		26					182	12	48	105		392
8:30 AM	36		45					159	18	32	128		418
8:45 AM	31		24					225	18	52	159		509
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	239	0	227	0	0	0	0	1623	162	303	1224	0	3778

AM Peak Hr Begins at: 715 AM

PEAK													
VOLUMES =	144	0	104	0	0	0	0	876	100	143	703	0	2070
PEAK HR. FACTOR:		0.795			0.000			0.816			0.745		0.895

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Heathercliff Rd DATE: 5/8/2007 LOCATION: City of Malibu

E-W STREET: Pacific Coast Hwy DAY: TUESDAY PROJECT# 07-2226-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0	1					2	1	1	2		
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	35		50					233	12	39	189		558
4:15 PM	27		33					231	18	53	250		612
4:30 PM	31		38					150	33	41	201		494
4:45 PM	26		39					202	5	22	177		471
5:00 PM	31		47					201	20	41	176		516
5:15 PM	34		49					186	19	39	156		483
5:30 PM	26		48					99	12	45	135		365
5:45 PM	22		42					124	9	29	134		360
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	232	0	346	0	0	0	0	1426	128	309	1418	0	3859

PM Peak Hr Begins at: 400 PM

PEAK VOLUMES =	119	0	160	0	0	0	0	816	68	155	817	0	2135
PEAK HR. FACTOR:		0.821			0.000			0.888			0.802		0.872

CONTROL: Signalized

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File Name : Kanan1
Site Code : 00000000
Start Date : 3/13/2007
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Groups Printed- 1 - Unshifted

	PCH Southbound			Kanan Dume Rd Westbound			PCH Northbound			Kanan Dume Rd Eastbound			
Start Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	21	201	0	40	0	55	0	130	14	0	0	0	461
07:15 AM	28	199	0	48	0	40	0	176	21	0	0	0	512
07:30 AM	26	229	0	63	2	75	0	254	19	0	0	0	668
07:45 AM	40	265	0	59	0	62	0	211	20	0	0	0	657
Total	115	894	0	210	2	232	0	771	74	0	0	0	2298
08:00 AM	64	267	0	40	0	67	0	164	26	0	0	0	628
08:15 AM	35	240	0	56	2	63	0	175	33	0	0	0	604
08:30 AM	44	207	0	56	0	52	0	134	43	0	0	0	536
08:45 AM	37	217	0	51	0	61	0	177	26	0	0	0	569
Total	180	931	0	203	2	243	0	650	128	0	0	0	2337
04:00 PM	67	238	1	44	0	47	0	278	62	0	0	0	737
04:15 PM	56	229	0	38	0	70	0	267	48	0	0	0	708
04:30 PM	65	235	0	46	0	41	0	276	58	0	0	0	721
04:45 PM	57	223	1	37	0	55	0	273	49	0	0	0	695
Total	245	925	2	165	0	213	0	1094	217	0	0	0	2861
05:00 PM	50	249	2	33	0	51	0	278	62	0	0	0	725
05:15 PM	52	258	0	45	2	72	0	290	61	0	0	0	780
05:30 PM	75	242	0	38	0	58	0	255	39	0	0	0	707
05:45 PM	51	223	0	45	0	53	0	237	55	0	0	0	664
Total	228	972	2	161	2	234	0	1060	217	0	0	0	2876
Grand Total	768	3722	4	739	6	922	0	3575	636	0	0	0	10372
Apprch %	17.1	82.8	0.1	44.3	0.4	55.3	0.0	84.9	15.1	0.0	0.0	0.0	
Total %	7.4	35.9	0.0	7.1	0.1	8.9	0.0	34.5	6.1	0.0	0.0	0.0	

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File Name : Kanan1
Site Code : 00000000
Start Date : 3/13/2007
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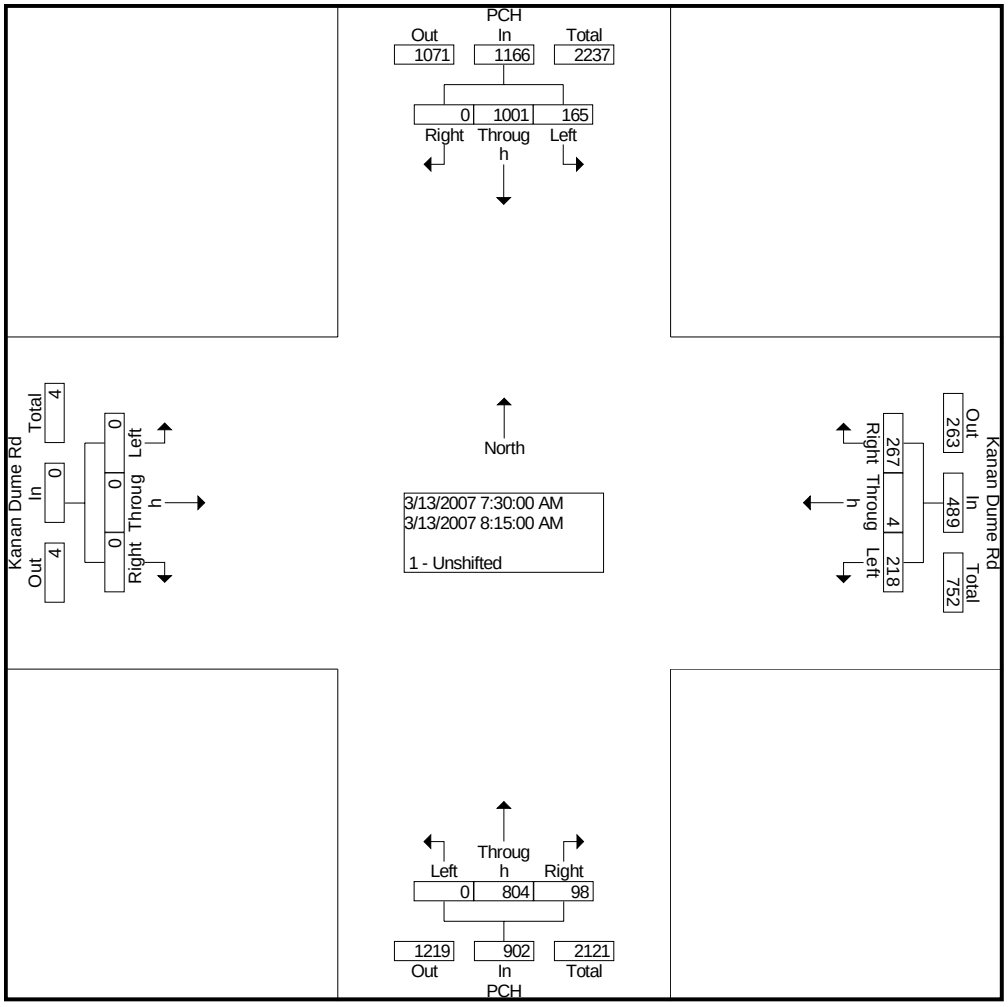
	PCH Southbound				Kanan Dume Rd Westbound				PCH Northbound				Kanan Dume Rd Eastbound				
Start Time	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Int. Total
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:30 AM																
Volume	165	1001	0	1166	218	4	267	489	0	804	98	902	0	0	0	0	2557
Percent	14.2	85.8	0.0		44.6	0.8	54.6		0.0	89.1	10.9		0.0	0.0	0.0		
07:30 Volume	26	229	0	255	63	2	75	140	0	254	19	273	0	0	0	0	668
Peak Factor																	0.957
High Int.	08:00 AM				07:30 AM				07:30 AM				6:45:00 AM				
Volume	64	267	0	331	63	2	75	140	0	254	19	273					
Peak Factor				0.881				0.873				0.826					



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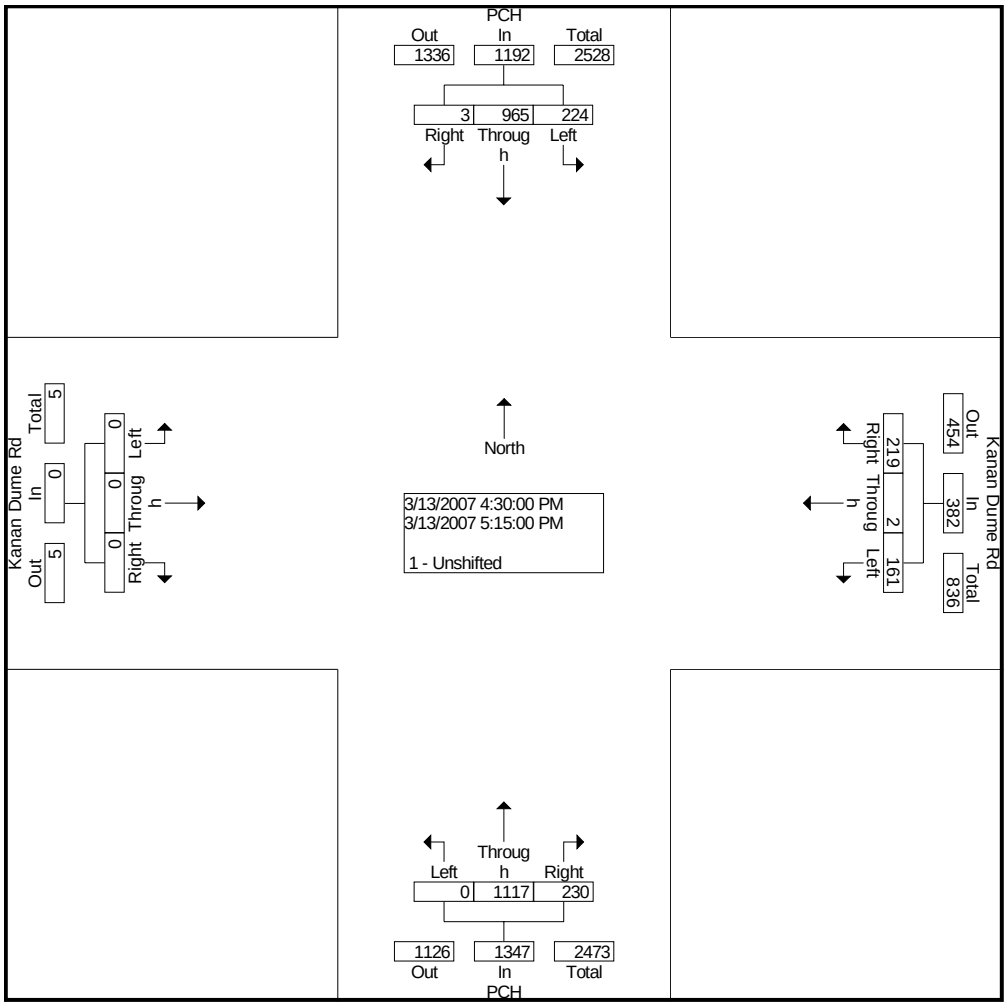
File Name : Kanan1
Site Code : 00000000
Start Date : 3/13/2007
Page No : 3

	PCH Southbound				Kanan Dume Rd Westbound				PCH Northbound				Kanan Dume Rd Eastbound				
Start Time	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Left	Throu g h	Right	App. Total	Int. Total
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:30 PM																
Volume	224	965	3	1192	161	2	219	382	0	1117	230	1347	0	0	0	0	2921
Percent	18.8	81.0	0.3		42.1	0.5	57.3		0.0	82.9	17.1		0.0	0.0	0.0		
05:15 Volume	52	258	0	310	45	2	72	119	0	290	61	351	0	0	0	0	780
Peak Factor																	0.936
High Int.	05:15 PM				05:15 PM				05:15 PM								
Volume	52	258	0	310	45	2	72	119	0	290	61	351					
Peak Factor				0.961				0.803				0.959					



APPENDIX B

ICU AND LEVEL OF SERVICE EXPLANATION
HCM AND LEVEL OF SERVICE EXPLANATION
ICU AND HCS DATA WORKSHEETS –
WEEKDAY AM AND PM PEAK HOURS

INTERSECTION CAPACITY UTILIZATION (ICU) DESCRIPTION

Level of Service is a term used to describe prevailing conditions and their effect on traffic. Broadly interpreted, the Levels of Service concept denotes any one of a number of differing combinations of operating conditions which may occur as a roadway is accommodating various traffic volumes. Level of Service is a qualitative measure of the effect of such factors as travel speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

Six Levels of Service, A through F, have been defined in the 1965 *Highway Capacity Manual*, published by the Transportation Research Board. Level of Service A describes a condition of free flow, with low traffic volumes and relatively high speeds, while Level of Service F describes forced traffic flow at low speeds with jammed conditions and queues which cannot clear during the green phases.

The Intersection Capacity Utilization (ICU) method of intersection capacity analysis has been used in our studies. It directly relates traffic demand and available capacity for key intersection movements, regardless of present signal timing, The capacity per hour of green time for each approach is calculated based on the methods of the *Highway Capacity Manual*. The proportion of total signal time needed by each key movement is determined and compared to the total time available (100 percent of the hour). The result of summing the requirements of the conflicting key movements plus an allowance for clearance times is expressed as a decimal fraction. Conflicting key traffic movements are those opposing movements whose combined green time requirements are greatest.

The resulting ICU represents the proportion of the total hour required to accommodate intersection demand volumes if the key conflicting traffic movements are operating at capacity. Other movements may be operating near capacity, or may be operating at significantly better levels. The ICU may be translated to a Level of Service as tabulated below.

The Levels of Service (abbreviated from the *Highway Capacity Manual*) are listed here with their corresponding ICU and Load Factor equivalents. Load Factor is that proportion of the signal cycles during the peak hour which are fully loaded; i.e. when all of the vehicles waiting at the beginning of green are not able to clear on that green phase.

Intersection Capacity Utilization Characteristics

Level of Service	Load Factor	Equivalent ICU
A	0.0	0.00 - 0.60
B	0.0 - 0.1	0.61 - 0.70
C	0.1 - 0.3	0.71 - 0.80
D	0.3 - 0.7	0.81 - 0.90
E	0.7 - 1.0	0.91 - 1.00
F	Not Applicable	Not Applicable

SERVICE LEVEL A
There are no loaded cycles and few are even close to loaded at this service level. No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.

SERVICE LEVEL B
This level represents stable operation where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.

SERVICE LEVEL C
At this level stable operation continues. Loading is still intermittent but more frequent than at Level B. Occasionally drivers may have to wait through more than one red signal indication and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.

SERVICE LEVEL D
This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak hour, but enough cycles with lower demand occur to permit periodic clearance of queues, thus preventing excessive backups. Drivers frequently have to wait through more than one red signal. This level is the lower limit of acceptable operation to most drivers.

SERVICE LEVEL E
This represents near capacity and capacity operation. At capacity (ICU = 1.0) it represents the most vehicles that the particular intersection can accommodate. However, full utilization of every signal cycle is seldom attained no matter how great the demand. At this level all drivers wait through more than one red signal, and frequently through several.

SERVICE LEVEL F
Jammed conditions. Traffic backed up from a downstream location on one of the street restricts or prevents movement of traffic through the intersection under consideration.

LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

In the *Highway Capacity Manual (HCM)*, published by the Transportation Research Board, 2010, level of service for unsignalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, in the absence of incidents, control, traffic, or geometric delay. Only the portion of total delay attributed to the traffic control measures, either traffic signals or stop signs, is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Level of Service criteria for unsignalized intersections are stated in terms of the average control delay per vehicle. The level of service is determined by the computed or measured control delay and is defined for each minor movement. Average control delay for any particular minor movement is a function of the service time for the approach and the degree of utilization. (Level of service is not defined for the intersection as a whole for two-way stop controlled intersections.)

Level of Service Criteria for TWSC/AWSC Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Level of Service (LOS) values are used to describe intersection operations with service levels varying from LOS A (free flow) to LOS F (jammed condition). The following descriptions summarize *HCM* criteria for each level of service:

LOS A describes operations with very low control delay, up to 10 seconds per vehicle.

LOS B describes operations with control delay greater than 10 and up to 15 seconds per vehicle.

LOS C describes operations with control delay greater than 15 and up to 25 seconds per vehicle.

LOS D describes operations with control delay greater than 25 and up to 35 seconds per vehicle.

LOS E describes operations with control delay greater than 35 and up to 50 seconds per vehicle.

LOS F describes operations with control delay in excess of 50 seconds per vehicle. For two-way stop controlled intersections, LOS F exists when there are insufficient gaps of suitable size to allow side-street demand to safely cross through a major-street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches.

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*TTN*	Intersection	*1*
Agency/Co.	*LLG*	Jurisdiction	*Caltrans/City of Malibu*
Date Performed	*4/2/2014*	Analysis Year	*Existing*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*2*	*645*			*329*	*2*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*2*	*645*	*0*	*0*	*329*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*17*		*6*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*17*	*0*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (veh/h)	*2*						*23*	
C (m) (veh/h)	*1240*						*469*	
v/c	*0.00*						*0.05*	
95% queue length	*0.00*						*0.15*	
Control Delay (s/veh)	*7.9*						*13.1*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*13.1*	
Approach LOS	--	--					*B*	

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	*LLG*
Date Performed	*4/2/2014*
Analysis Time Period	*Weekday PM Peak Hour*

Site Information

Intersection	*1*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*15*	*447*			*802*	*34*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*15*	*447*	*0*	*0*	*802*	*34*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*20*		*8*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*20*	*0*	*8*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (veh/h)	*15*						*28*	
C (m) (veh/h)	*807*						*263*	
v/c	*0.02*						*0.11*	
95% queue length	*0.06*						*0.35*	
Control Delay (s/veh)	*9.5*						*20.3*	
LOS	*A*						*C*	
Approach Delay (s/veh)	--	--					*20.3*	
Approach LOS	--	--					*C*	

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	*1*
Agency/Co.	*LLG*	Jurisdiction	*Caltrans/City of Malibu*
Date Performed	*4/2/2014*	Analysis Year	*Existing+Project*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*2*	*713*			*389*	*2*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*2*	*713*	*0*	*0*	*389*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*17*		*6*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*17*	*0*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (veh/h)	*2*						*23*	
C (m) (veh/h)	*1179*						*413*	
v/c	*0.00*						*0.06*	
95% queue length	*0.01*						*0.18*	
Control Delay (s/veh)	*8.1*						*14.2*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*14.2*	
Approach LOS	--	--					*B*	

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	*1*
Agency/Co.	*LLG*	Jurisdiction	*Caltrans/City of Malibu*
Date Performed	*4/2/2014*	Analysis Year	*Existing+Project*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Decker Road* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*15*	*507*			*870*	*34*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*15*	*507*	*0*	*0*	*870*	*34*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*0*	*2*	*0*
Configuration	*L*	*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*20*		*8*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*20*	*0*	*8*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (veh/h)	*15*						*28*	
C (m) (veh/h)	*761*						*231*	
v/c	*0.02*						*0.12*	
95% queue length	*0.06*						*0.41*	
Control Delay (s/veh)	*9.8*						*22.7*	
LOS	*A*						*C*	
Approach Delay (s/veh)	--	--					*22.7*	
Approach LOS	--	--					*C*	

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INTERSECTION CAPACITY UTILIZATION

Trancas Canyon Road-Broad Beach Road @ Pacific Coast Highway

N-S St: Trancas Canyon Road-Broad Beach Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU2

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	180	0	0.113	9	189	0.118	0	189	0	0.118	0	189	0	0.118	0	189	0	0.118	0	189	0	0.118
Nb Thru	11	1600	0.135 *	1	12	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *	0	12	1600	0.142 *
Nb Right	25	0	-	1	26	-	0	26	0	-	0	26	0	-	0	26	0	-	0	26	0	-
Sb Left	4	0	0.003 *	0	4	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *	0	4	0	0.003 *
Sb Thru	4	1600	0.018	0	4	0.018	0	4	1600	0.018	0	4	1600	0.018	0	4	1600	0.018	0	4	1600	0.018
Sb Right	20	0	-	1	21	-	0	21	0	-	0	21	0	-	0	21	0	-	0	21	0	-
Eb Left	111	1600	0.069 *	6	117	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *	0	117	1600	0.073 *
Eb Thru	325	3200	0.129	16	341	0.135	68	409	3200	0.156	0	409	3200	0.156	0	409	3200	0.156	0	409	3200	0.156
Eb Right	87	0	-	4	91	-	0	91	0	-	0	91	0	-	0	91	0	-	0	91	0	-
Wb Left	69	1600	0.043	3	72	0.045	7	79	1600	0.050	0	79	1600	0.050	0	79	1600	0.050	0	79	1600	0.050
Wb Thru	723	3200	0.229 *	36	759	0.241 *	60	819	3200	0.260 *	0	819	3200	0.260 *	0	819	3200	0.260 *	0	819	3200	0.260 *
Wb Right	11	0	-	1	12	-	0	12	0	-	0	12	0	-	0	12	0	-	0	12	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.486			0.508				0.527				0.527				0.527				0.527
LOS			A			A				A				A				A				A

01:32 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Trancas Canyon Road-Broad Beach Road @ Pacific Coast Highway

N-S St: Trancas Canyon Road-Broad Beach Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU2

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	141	0	0.088	7	148	0.093	0	148	0	0.093	0	148	0	0.093	0	148	0	0.093	0	148	0	0.093
Nb Thru	14	1600	0.119 *	1	15	0.125 *	0	15	1600	0.125 *	0	15	1600	0.125 *	0	15	1600	0.125 *	0	15	1600	0.125 *
Nb Right	36	0	-	2	38	-	0	38	0	-	0	38	0	-	0	38	0	-	0	38	0	-
Sb Left	29	0	0.018 *	1	30	0.019 *	0	30	0	0.019 *	0	30	0	0.019 *	0	30	0	0.019 *	0	30	0	0.019 *
Sb Thru	11	1600	0.044	1	12	0.047	0	12	1600	0.047	0	12	1600	0.047	0	12	1600	0.047	0	12	1600	0.047
Sb Right	31	0	-	2	33	-	0	33	0	-	0	33	0	-	0	33	0	-	0	33	0	-
Eb Left	79	1600	0.049	4	83	0.052	0	83	1600	0.052	0	83	1600	0.052	0	83	1600	0.052	0	83	1600	0.052
Eb Thru	756	3200	0.265 *	38	794	0.278 *	60	854	3200	0.297 *	0	854	3200	0.297 *	0	854	3200	0.297 *	0	854	3200	0.297 *
Eb Right	91	0	-	5	96	-	0	96	0	-	0	96	0	-	0	96	0	-	0	96	0	-
Wb Left	83	1600	0.052 *	4	87	0.054 *	0	87	1600	0.054 *	0	87	1600	0.054 *	0	87	1600	0.054 *	0	87	1600	0.054 *
Wb Thru	574	3200	0.189	29	603	0.199	68	671	3200	0.220	0	671	3200	0.220	0	671	3200	0.220	0	671	3200	0.220
Wb Right	32	0	-	2	34	-	0	34	0	-	0	34	0	-	0	34	0	-	0	34	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.504			0.527				0.546				0.546				0.546				0.546
LOS			A			A				A				A				A				A

01:32 PM

* *Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Outbound Project Driveway @ Pacific Coast Highway

N-S St: Outbound Project Driveway
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU3

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2013
Projection Year: 2014

	2013 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	1600	0.000	0	0	0.000	60	60	1600	0.038	0	60	1600	0.038	0	60	1600	0.038	0	60	1600	0.038
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Sb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Eb Thru	801	3200	0.250 *	8	809	0.253 *	75	884	3200	0.276 *	0	884	3200	0.276 *	0	884	3200	0.276 *	0	884	3200	0.276 *
Eb Right	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Wb Left	0	1600	0.000 *	0	0	0.000 *	0	0	1600	0.000 *	0	0	1600	0.000 *	0	0	1600	0.000 *	0	0	1600	0.000 *
Wb Thru	517	3200	0.162	5	522	0.163	7	529	3200	0.165	0	529	3200	0.165	0	529	3200	0.165	0	529	3200	0.165
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.300			0.303				0.364				0.364				0.364				0.364
LOS			A			A				A				A				A				A

01:33 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: Extrapolated from ICU4
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Outbound Project Driveway @ Pacific Coast Highway

N-S St: Outbound Project Driveway
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU3

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2013
Projection Year: 2014

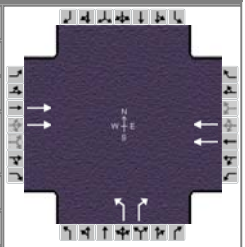
	2013 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	1600	0.000	0	0	0.000	68	68	1600	0.043	0	68	1600	0.043	0	68	1600	0.043	0	68	1600	0.043
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	1600	0.000	0	0	0.000	7	7	1600	0.004	0	7	1600	0.004	0	7	1600	0.004	0	7	1600	0.004
Sb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Eb Thru	702	3200	0.219	7	709	0.222	60	769	3200	0.240	0	769	3200	0.240	0	769	3200	0.240	0	769	3200	0.240
Eb Right	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Wb Left	0	1600	0.000	0	0	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000	0	0	1600	0.000
Wb Thru	989	3200	0.309 *	10	999	0.312 *	0	999	3200	0.312 *	0	999	3200	0.312 *	0	999	3200	0.312 *	0	999	3200	0.312 *
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.359			0.362				0.405				0.405				0.405				0.405
LOS			A			A				A				A				A				A

01:33 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: Extrapolated from ICU4
2 Capacity expressed in veh/hour of green

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LLG			Duration, h	0.25
Analyst	TTN	Analysis Date	Apr 2, 2014	Area Type	Other
Jurisdiction	Caltrans	Time Period	Weekday Peak Hour	PHF	1.00
Intersection	Outbound Project Driveway	Analysis Year	Existing	Analysis Period	1> 7:00
File Name	C2INT3AM.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		884			529		60		0			

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

							1	2	3	4
Green	45.0	5.0	0.0	0.0	0.0	0.0	5	6	7	8
Yellow	4.0	4.0	0.0	0.0	0.0	0.0				
Red	1.0	1.0	0.0	0.0	0.0	0.0				

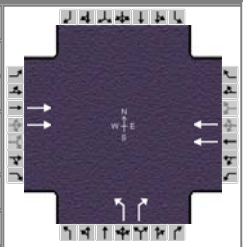
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		4		
Case Number		8.0		8.0		9.0		
Phase Duration, s		50.0		50.0		10.0		
Change Period, *(Y+Rc)*, s		5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s		0.0		0.0		0.7		
Queue Clearance Time *(g_s)*, s						3.9		
Green Extension Time *(g_e)*, s		0.0		0.0		0.0		
Phase Call Probability						1.00		
Max Out Probability						0.20		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		7		14			
Adjusted Flow Rate *(v)*, veh/h		884			529		60		0			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1809			1809		1810		1610			
Queue Service Time *(g_s)*, s		4.9			2.6		1.9		0.0			
Cycle Queue Clearance Time *(g_c)*, s		4.9			2.6		1.9		0.0			
Capacity *(c)*, veh/h		2713			2713		151		134			
Volume-to-Capacity Ratio *(X)*		0.326			0.195		0.398		0.000			
Available Capacity *(c_a)*, veh/h		2713			2713		151		134			
Back of Queue *(Q)*, veh/ln (50th percentile)		0.5			0.2		0.8		0.0			
Overflow Queue *(Q_3)*, veh/ln		0.0			0.0		0.0		0.0			
Queue Storage Ratio *(RQ)* (50th percentile)		0.00			0.00		0.00		0.00			
Uniform Delay *(d_1)*, s/veh		2.5			2.2		26.1		0.0			
Incremental Delay *(d_2)*, s/veh		0.3			0.2		0.6		0.0			
Initial Queue Delay *(d_3)*, s/veh		0.0			0.0		0.0		0.0			
Control Delay *(d)*, s/veh		2.8			2.4		26.7		0.0			
Level of Service (LOS)		A			A		C					
Approach Delay, s/veh / LOS	2.8	A		2.4	A		26.7	C		0.0		
Intersection Delay, s/veh / LOS	3.6						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.6	A	0.6	A	2.7	B	2.7	B
Bicycle LOS Score / LOS	1.2	A	0.9	A		F		

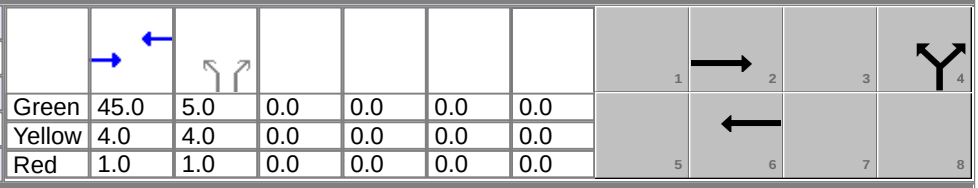
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	LLG			Duration, h	0.25
Analyst	TTN	Analysis Date	Apr 2, 2014	Area Type	Other
Jurisdiction	Caltrans	Time Period	Weekday Peak Hour	PHF	1.00
Intersection	Outbound Project Driveway	Analysis Year	Existing	Analysis Period	1> 7:00
File Name	C2INT3AM.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		884			529		60		0			

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	45.0	5.0	0.0	0.0	0.0	0.0		
Yellow	4.0	4.0	0.0	0.0	0.0	0.0		
Red	1.0	1.0	0.0	0.0	0.0	0.0		

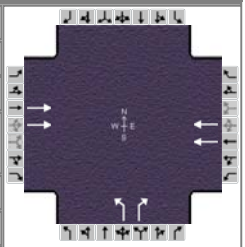
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		4		
Case Number		8.0		8.0		9.0		
Phase Duration, s		50.0		50.0		10.0		
Change Period, *(Y+Rc)*, s		5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s		0.0		0.0		0.7		
Queue Clearance Time *(gs)*, s						3.9		
Green Extension Time *(ge)*, s		0.0		0.0		0.0		
Phase Call Probability						1.00		
Max Out Probability						0.20		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		7		14			
Adjusted Flow Rate *(v)*, veh/h		884			529		60		0			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1809			1809		1810		1610			
Queue Service Time *(gs)*, s		4.9			2.6		1.9		0.0			
Cycle Queue Clearance Time *(gc)*, s		4.9			2.6		1.9		0.0			
Capacity *(c)*, veh/h		2713			2713		151		134			
Volume-to-Capacity Ratio *(X)*		0.326			0.195		0.398		0.000			
Available Capacity *(ca)*, veh/h		2713			2713		151		134			
Back of Queue *(Q)*, veh/ln (95th percentile)		0.8			0.4		1.4		0.0			
Overflow Queue *(Q3)*, veh/ln		0.0			0.0		0.0		0.0			
Queue Storage Ratio *(RQ)* (95th percentile)		0.00			0.00		0.00		0.00			
Uniform Delay *(d1)*, s/veh		2.5			2.2		26.1		0.0			
Incremental Delay *(d2)*, s/veh		0.3			0.2		0.6		0.0			
Initial Queue Delay *(d3)*, s/veh		0.0			0.0		0.0		0.0			
Control Delay *(d)*, s/veh		2.8			2.4		26.7		0.0			
Level of Service (LOS)		A			A		C					
Approach Delay, s/veh / LOS	2.8	A		2.4	A		26.7	C		0.0		
Intersection Delay, s/veh / LOS	3.6						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.6	A	0.6	A	2.7	B	2.7	B
Bicycle LOS Score / LOS	1.2	A	0.9	A		F		

HCS 2010 Signalized Intersection Results Summary

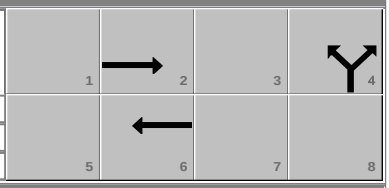
General Information				Intersection Information	
Agency	LLG			Duration, h	0.25
Analyst	TTN	Analysis Date	Apr 2, 2014	Area Type	Other
Jurisdiction	Caltrans	Time Period	Weekday Peak Hour	PHF	1.00
Intersection	Outbound Project Driveway	Analysis Year	Existing	Analysis Period	1> 7:00
File Name	C2INT3PM.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		769			999		68		7			

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	45.0	5.0	0.0	0.0	0.0	0.0	
Yellow	4.0	4.0	0.0	0.0	0.0	0.0	
Red	1.0	1.0	0.0	0.0	0.0	0.0	



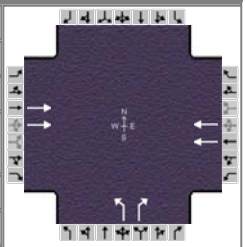
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		4		
Case Number		8.0		8.0		9.0		
Phase Duration, s		50.0		50.0		10.0		
Change Period, ($Y+R_c$), s		5.0		5.0		5.0		
Max Allow Headway (*MAH*), s		0.0		0.0		0.7		
Queue Clearance Time (g_s), s						4.1		
Green Extension Time (g_e), s		0.0		0.0		0.0		
Phase Call Probability						1.00		
Max Out Probability						0.67		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		7		14			
Adjusted Flow Rate (*v*), veh/h		769			999		68		7			
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1809			1809		1810		1610			
Queue Service Time (g_s), s		4.0			5.7		2.1		0.2			
Cycle Queue Clearance Time (g_c), s		4.0			5.7		2.1		0.2			
Capacity (*c*), veh/h		2713			2713		151		134			
Volume-to-Capacity Ratio (*X*)		0.283			0.368		0.451		0.052			
Available Capacity (c_a), veh/h		2713			2713		151		134			
Back of Queue (*Q*), veh/ln (50th percentile)		0.4			0.5		0.9		0.1			
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0			
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		2.4			2.6		26.2		25.3			
Incremental Delay (d_2), s/veh		0.3			0.4		0.8		0.1			
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0			
Control Delay (*d*), s/veh		2.6			3.0		27.0		25.4			
Level of Service (LOS)		A			A		C		C			
Approach Delay, s/veh / LOS	2.6	A		3.0	A		26.8	C		0.0		
Intersection Delay, s/veh / LOS	3.8						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.6	A	0.6	A	2.7	B	2.7	B
Bicycle LOS Score / LOS	1.1	A	1.3	A		F		

HCS 2010 Signalized Intersection Results Summary

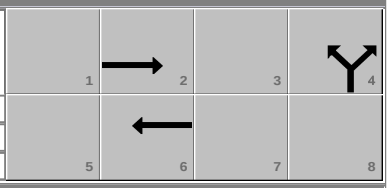
General Information				Intersection Information	
Agency	LLG			Duration, h	0.25
Analyst	TTN	Analysis Date	Apr 2, 2014	Area Type	Other
Jurisdiction	Caltrans	Time Period	Weekday Peak Hour	PHF	1.00
Intersection	Outbound Project Driveway	Analysis Year	Existing	Analysis Period	1> 7:00
File Name	C2INT3PM.xus				
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h		769			999		68		7			

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	45.0	5.0	0.0	0.0	0.0	0.0	
Yellow	4.0	4.0	0.0	0.0	0.0	0.0	
Red	1.0	1.0	0.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		4		
Case Number		8.0		8.0		9.0		
Phase Duration, s		50.0		50.0		10.0		
Change Period, $(Y+R_c)$, s		5.0		5.0		5.0		
Max Allow Headway *(MAH)*, s		0.0		0.0		0.7		
Queue Clearance Time (g_s), s						4.1		
Green Extension Time (g_e), s		0.0		0.0		0.0		
Phase Call Probability						1.00		
Max Out Probability						0.67		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2			6		7		14			
Adjusted Flow Rate *(v)*, veh/h		769			999		68		7			
Adjusted Saturation Flow Rate *(s)*, veh/h/ln		1809			1809		1810		1610			
Queue Service Time (g_s), s		4.0			5.7		2.1		0.2			
Cycle Queue Clearance Time (g_c), s		4.0			5.7		2.1		0.2			
Capacity *(c)*, veh/h		2713			2713		151		134			
Volume-to-Capacity Ratio *(X)*		0.283			0.368		0.451		0.052			
Available Capacity (c_a), veh/h		2713			2713		151		134			
Back of Queue *(Q)*, veh/ln (95th percentile)		0.7			1.0		1.5		0.2			
Overflow Queue (Q_3), veh/ln		0.0			0.0		0.0		0.0			
Queue Storage Ratio *(RQ)* (95th percentile)		0.00			0.00		0.00		0.00			
Uniform Delay (d_1), s/veh		2.4			2.6		26.2		25.3			
Incremental Delay (d_2), s/veh		0.3			0.4		0.8		0.1			
Initial Queue Delay (d_3), s/veh		0.0			0.0		0.0		0.0			
Control Delay *(d)*, s/veh		2.6			3.0		27.0		25.4			
Level of Service (LOS)		A			A		C		C			
Approach Delay, s/veh / LOS	2.6	A		3.0	A		26.8	C		0.0		
Intersection Delay, s/veh / LOS	3.8						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.6	A	0.6	A	2.7	B	2.7	B
Bicycle LOS Score / LOS	1.1	A	1.3	A		F		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	*LLG*
Date Performed	*4/2/2014*
Analysis Time Period	*Weekday AM Peak Hour*

Site Information

Intersection	*4*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernset Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*147*	*662*		*0*	*407*	*56*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*147*	*662*	*0*	*0*	*407*	*56*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*		*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*53*		*115*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*53*	*0*	*115*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*147*	*0*					*168*	
C (m) (veh/h)	*1109*	*936*					*404*	
v/c	*0.13*	*0.00*					*0.42*	
95% queue length	*0.46*	*0.00*					*2.00*	
Control Delay (s/veh)	*8.7*	*8.8*					*20.1*	
LOS	*A*	*A*					*C*	
Approach Delay (s/veh)	--	--				*20.1*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	*LLG*
Date Performed	*4/2/2014*
Analysis Time Period	*Weekday PM Peak Hour*

Site Information

Intersection	*4*
Jurisdiction	*Caltrans/City of Malibu*
Analysis Year	*Existing*

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernset Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*30*	*679*		*0*	*960*	*18*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*30*	*679*	*0*	*0*	*960*	*18*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*		*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*18*		*39*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*18*	*0*	*39*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*30*	*0*					*57*	
C (m) (veh/h)	*714*	*923*					*283*	
v/c	*0.04*	*0.00*					*0.20*	
95% queue length	*0.13*	*0.00*					*0.74*	
Control Delay (s/veh)	*10.3*	*8.9*					*20.9*	
LOS	*B*	*A*					*C*	
Approach Delay (s/veh)	--	--				*20.9*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	*4*
Agency/Co.	*LLG*	Jurisdiction	*Caltrans/City of Malibu*
Date Performed	*4/2/2014*	Analysis Year	*Existing+Project*
Analysis Time Period	*Weekday AM Peak Hour*		

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernset Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*147*	*662*	*75*	*0*	*414*	*56*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*147*	*662*	*75*	*0*	*414*	*56*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*1*	*1*	*2*	*0*
Configuration	*L*	*T*	*R*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*53*		*115*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*53*	*0*	*115*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*147*	*0*					*168*	
C (m) (veh/h)	*1102*	*878*					*399*	
v/c	*0.13*	*0.00*					*0.42*	
95% queue length	*0.46*	*0.00*					*2.04*	
Control Delay (s/veh)	*8.8*	*9.1*					*20.4*	
LOS	*A*	*A*					*C*	
Approach Delay (s/veh)	--	--				*20.4*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	*4*
Agency/Co.	*LLG*	Jurisdiction	*Caltrans/City of Malibu*
Date Performed	*4/2/2014*	Analysis Year	*Existing+Project*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *5-13-0064-1 Broad Beach Restoration Project*

East/West Street: *Guernset Ave-Inbound Proj Dwy* | North/South Street: *Pacific Coast Highway*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*30*	*686*	*60*	*0*	*960*	*18*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*30*	*686*	*60*	*0*	*960*	*18*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*1*	*1*	*2*	*0*
Configuration	*L*	*T*	*R*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*18*		*39*
Peak-Hour Factor, PHF						
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*18*	*0*	*39*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*					*LR*	
v (veh/h)	*30*	*0*					*57*	
C (m) (veh/h)	*714*	*871*					*283*	
v/c	*0.04*	*0.00*					*0.20*	
95% queue length	*0.13*	*0.00*					*0.74*	
Control Delay (s/veh)	*10.3*	*9.1*					*20.9*	
LOS	*B*	*A*					*C*	
Approach Delay (s/veh)	--	--				*20.9*		
Approach LOS	--	--				*C*		

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INTERSECTION CAPACITY UTILIZATION

Heathercliff Road @ Pacific Coast Highway

N-S St: Heathercliff Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU5

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	148	1600	0.093	7	155	0.097	0	155	1600	0.097	0	155	1600	0.097	0	155	1600	0.097	0	155	1600	0.097
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	107	1600	0.067	5	112	0.070	0	112	1600	0.070	0	112	1600	0.070	0	112	1600	0.070	0	112	1600	0.070
Sb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Eb Thru	916	3200	0.286 *	46	962	0.301 *	0	962	3200	0.301 *	0	962	3200	0.301 *	0	962	3200	0.301 *	0	962	3200	0.301 *
Eb Right	103	1600	0.064	5	108	0.068	0	108	1600	0.068	0	108	1600	0.068	0	108	1600	0.068	0	108	1600	0.068
Wb Left	147	1600	0.092 *	7	154	0.096 *	0	154	1600	0.096 *	0	154	1600	0.096 *	0	154	1600	0.096 *	0	154	1600	0.096 *
Wb Thru	753	3200	0.235	38	791	0.247	7	798	3200	0.249	0	798	3200	0.249	0	798	3200	0.249	0	798	3200	0.249
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.521			0.544				0.544				0.544				0.544				0.544
LOS			A			A				A				A				A				A

01:32 PM

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Heathercliff Road @ Pacific Coast Highway

N-S St: Heathercliff Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU5

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	123	1600	0.077	6	129	0.081	0	129	1600	0.081	0	129	1600	0.081	0	129	1600	0.081	0	129	1600	0.081
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	165	1600	0.103 *	8	173	0.108 *	0	173	1600	0.108 *	0	173	1600	0.108 *	0	173	1600	0.108 *	0	173	1600	0.108 *
Sb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Sb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Sb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Eb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Eb Thru	921	3200	0.288 *	46	967	0.302 *	7	974	3200	0.304 *	0	974	3200	0.304 *	0	974	3200	0.304 *	0	974	3200	0.304 *
Eb Right	70	1600	0.044	4	74	0.046	0	74	1600	0.046	0	74	1600	0.046	0	74	1600	0.046	0	74	1600	0.046
Wb Left	160	1600	0.100 *	8	168	0.105 *	0	168	1600	0.105 *	0	168	1600	0.105 *	0	168	1600	0.105 *	0	168	1600	0.105 *
Wb Thru	901	3200	0.282	45	946	0.296	0	946	3200	0.296	0	946	3200	0.296	0	946	3200	0.296	0	946	3200	0.296
Wb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.541			0.565				0.568				0.568				0.568				0.568
LOS			A			A				A				A				A				A

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INTERSECTION CAPACITY UTILIZATION

Kanan Dume Road @ Pacific Coast Highway

N-S St: Kanan Dume Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU6

Peak hr: AM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Sb Left	284	0	0.178	14	298	0.186	0	298	0	0.186	0	298	0	0.186	0	298	0	0.186	0	298	0	0.186
Sb Thru	0	1600	0.318 *	0	0	0.334 *	0	0	1600	0.334 *	0	0	1600	0.334 *	0	0	1600	0.334 *	0	0	1600	0.334 *
Sb Right	225	0	-	11	236	-	0	236	0	-	0	236	0	-	0	236	0	-	0	236	0	-
Eb Left	172	1600	0.108 *	9	181	0.113 *	0	181	1600	0.113 *	0	181	1600	0.113 *	0	181	1600	0.113 *	0	181	1600	0.113 *
Eb Thru	1039	3200	0.325	52	1091	0.341	0	1091	3200	0.341	0	1091	3200	0.341	0	1091	3200	0.341	0	1091	3200	0.341
Eb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Wb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Wb Thru	862	3200	0.301 *	43	905	0.316 *	7	912	3200	0.318 *	0	912	3200	0.318 *	0	912	3200	0.318 *	0	912	3200	0.318 *
Wb Right	101	0	-	5	106	-	0	106	0	-	0	106	0	-	0	106	0	-	0	106	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.777			0.813				0.815				0.815				0.815				0.815
LOS			C			D				D				D				D				D

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** Key conflicting movement as a part of ICU*
1 Counts conducted by: City Traffic Counters
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

Kanan Dume Road @ Pacific Coast Highway

N-S St: Kanan Dume Road
E-W St: Pacific Coast Highway
Project: Broad Beach Restoration Project/5-13-0064-1
File: ICU6

Peak hr: PM
Annual Growth: 1.00%

Date: 09/26/2013
Date of Count: 2009
Projection Year: 2014

	2009 EXIST. TRAFFIC			2014 W/AMBIENT GROWTH			2014 W/PROJECT SITE TRAFFIC				2014 W/PROJECT MITIGATION				2014 W/RELATED PROJECTS				2014 W/REGIONAL MITIGATION			
	1	2	V/C	Added	Total	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C	Added	Total	2	V/C
Movement	Volume	Capacity	Ratio	Volume	Volume	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio	Volume	Volume	Capacity	Ratio
Nb Left	0	0	0.000 *	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0.000 *
Nb Thru	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Nb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Sb Left	166	0	0.104	8	174	0.109	0	174	0	0.109	0	174	0	0.109	0	174	0	0.109	0	174	0	0.109
Sb Thru	0	1600	0.253 *	0	0	0.265 *	0	0	1600	0.265 *	0	0	1600	0.265 *	0	0	1600	0.265 *	0	0	1600	0.265 *
Sb Right	238	0	-	12	250	-	0	250	0	-	0	250	0	-	0	250	0	-	0	250	0	-
Eb Left	251	1600	0.157 *	13	264	0.165 *	0	264	1600	0.165 *	0	264	1600	0.165 *	0	264	1600	0.165 *	0	264	1600	0.165 *
Eb Thru	1067	3200	0.333	53	1120	0.350	7	1127	3200	0.352	0	1127	3200	0.352	0	1127	3200	0.352	0	1127	3200	0.352
Eb Right	0	0	-	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-	0	0	0	-
Wb Left	0	0	0.000	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0.000
Wb Thru	1196	3200	0.448 *	60	1256	0.470 *	0	1256	3200	0.470 *	0	1256	3200	0.470 *	0	1256	3200	0.470 *	0	1256	3200	0.470 *
Wb Right	237	0	-	12	249	-	0	249	0	-	0	249	0	-	0	249	0	-	0	249	0	-
Yellow Allowance:			0.050 *			0.050 *				0.050 *				0.050 *				0.050 *				0.050 *
ICU			0.907			0.950				0.950				0.950				0.950				0.950
LOS			E			E				E				E				E				E

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** Key conflicting movement as a part of ICU*
1 Counts conducted by: City Traffic Counters
2 Capacity expressed in veh/hour of green

APPENDIX C

HCM SEGMENT DATA WORKSHEETS – WEEKDAY PEAK HOUR

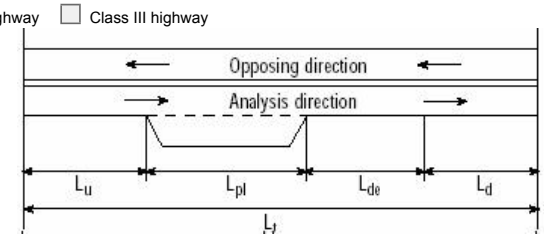
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		Site Information	
Analyst	*TTN*	Highway of Travel	*Pacific Coast Highway*
Agency or Company	*LLG*	From/To	*Las Posas to Yerba Buena*
Date Performed	*4/2/2014*	Jurisdiction	*Caltrans*
Analysis Time Period	*Weekday Peak Hour*	Analysis Year	*Existing*

Project Description: *5-13-0064-1 Broad Beach Restor*

Input Data

☑ Class I highway ☐ Class II highway ☐ Class III highway



Shoulder width (ft)	*6.0*
Lane Width (ft)	*12.0*
Segment Length (mi)	*1.0*
Total length of analysis segment, L_t	*1.0*
Length of two-lane highway upstream of the passing lane, L_u	*0.0*
Length of passing lane including tapers , L_{pl}	*0.9*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*46.8*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*69.1*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*D*
Average Travel Speed	
Length of the downstream highway segment within the effective length of passing lane for average travel speed, L_{de} (Exhibit 15-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d $L_d=L_t-(L_u+L_{pl}+L_{de})$	*-1.60*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 15-28)	*1.11*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl})+ (2L_{de}/(1+f_{pl,ATS}))$)	*51.9*
Percent free flow speed including passing lane, $PFFS_{pl} = (ATS_{pl}/ FFS)$	*89.5*
Percent Time-Spent-Following	
Length of the downstream highway segment within the effective length of passing lane for percent time-spent-following, L_{de} (Exhibit 15-23)	*5.96*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, $L_d = L_t-(L_u+L_{pl}+L_{de})$	*-5.86*
Adj. factor for the effect of passing lane on percent time-spent-following, $f_{pl,PTSF}$(Exhibit 15-26)	*0.61*
Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl}= PTSF_d[L_u+L_d+f_{pl,PTSF}L_{pl}+((1+f_{pl,PTSF})/2)L_{de}]/L_t$	*42.2*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 15-3)	*B*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS_{pl}$	*3.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*667.0*
Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.94*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.86*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. If LOS_d=F, passing lane analysis cannot be performed.
2. If L_d <0, use alternative Equation 15-18.
3. If L_d<0, use alternative Equation 15-16.
4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.

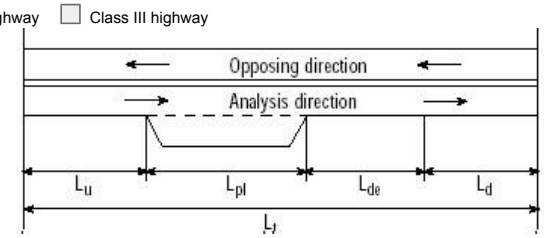
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		Site Information	
Analyst	*TTN*	Highway of Travel	*Pacific Coast Highway*
Agency or Company	*LLG*	From/To	*Las Posas to Yerba Buena*
Date Performed	*4/2/2014*	Jurisdiction	*Caltrans*
Analysis Time Period	*Weekday Peak Hour*	Analysis Year	*Existing*

Project Description: *5-13-0064-1 Broad Beach Restor*

Input Data

☑ Class I highway ☐ Class II highway ☐ Class III highway



Shoulder width (ft)	*6.0*
Lane Width (ft)	*12.0*
Segment Length (mi)	*1.0*
Total length of analysis segment, L_t	*1.0*
Length of two-lane highway upstream of the passing lane, L_u	*0.0*
Length of passing lane including tapers , L_{pl}	*0.9*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*45.6*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*73.3*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*D*
Average Travel Speed	
Length of the downstream highway segment within the effective length of passing lane for average travel speed, L_{de} (Exhibit 15-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d $L_d=L_t-(L_u+L_{pl}+L_{de})$	*-1.60*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 15-28)	*1.11*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl})+ (2L_{de}/(1+f_{pl,ATS}))$)	*50.6*
Percent free flow speed including passing lane, $PFFS_{pl} = (ATS_{pl}/ FFS)$	*87.2*
Percent Time-Spent-Following	
Length of the downstream highway segment within the effective length of passing lane for percent time-spent-following, L_{de} (Exhibit 15-23)	*5.40*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, $L_d = L_t-(L_u+L_{pl}+L_{de})$	*-5.30*
Adj. factor for the effect of passing lane on percent time-spent-following, $f_{pl,PTSF}$(Exhibit 15-26)	*0.62*
Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl}= PTSF_d[L_u+L_d+f_{pl,PTSF}L_{pl}+((1+f_{pl,PTSF})/2)L_{de}]/L_t$	*45.5*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 15-3)	*B*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS_{pl}$	*3.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*743.2*
Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.94*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.92*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. If LOS_d=F, passing lane analysis cannot be performed.
2. If L_d <0, use alternative Equation 15-18.
3. If L_d<0, use alternative Equation 15-16.
4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.

APPENDIX D

ZUMA COUNTY BEACH DAILY PARKING COUNTS

APPENDIX TABLE D-1
PARKING COUNTS
Zuma County Beach Parking Lots

DAY	MONTH (YEAR)									
	SEPT. 2012	OCT.	NOV.	DEC.	JAN. 2013	FEB.	MAR.	APR.	MAY	
1	1466	200	136	1312	41	168	294	61	219	
2	2766	132	29	1039	36	293	875	114	206	
3	2741	52	44	8	45	265	357	312	285	
4	320	63	204	62	103	128	87	115	301	
5	146	52	126	103	88	97	54	142	136	
6	237	218	127	8	42	91	36	362	-	
7	309	218	25	57	274	97	46	265	47	
8	980	42	13	161	241	73	26	22	125	
9	624	104	25	27	187	329	211	52	117	
10	92	24	37	33	134	265	412	188	77	
11	59	16	1406	28	27	121	117	54	743	
12	76	36	24	79	22	143	85	105	954	
13	78	113	18	69	16	129	128	244	219	
14	382	188	38	84	13	143	133	65	116	
15	1560	130	29	60	14	329	215	128	60	
16	938	317	63	9	11	499	194	22	71	
17	504	141	11	12	34	597	174	85	85	
18	79	163	24	59	43	319	144	101	353	
19	100	44	30	44	105	85	227	214	651	
20	97	31	179	97	181	132	177	648	195	
21	411	40	33	21	327	94	181	611	58	
22	371	22	39	15	39	188	125	107	50	
23	-	25	86	20	12	426	1047	91	74	
24	107	26	127	15	35	500	494	11	143	
25	67	28	39	112	85	135	147	37	371	
26	233	58	19	44	178	154	392	103	1005	
27	49	341	13	35	26	127	204	519	2109	
28	58	36	8	38	26	174	54	556	101	
29	311	41	13	4	15		244	92	198	
30	443	86	7	35	21		375	46	200	**GRAND**
31		20		47	44		312		397	**TOTAL**
TOTAL	**15604**	**3007**	**2972**	**3737**	**2465**	**6101**	**7567**	**5472**	**9666**	56591

[1] Counts provided by Los Angeles County Department of Beaches and Harbors.

APPENDIX TABLE D-2
PARKING UTILIZATION
Zuma County Beach Parking Lots

PARKING	DAY	MONTH (YEAR)																	
		SEPT. 2012		OCT.		NOV.		DEC.		JAN. 2013		FEB.		MAR.		APR.		MAY	
SUPPLY		NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
2025	1	1466	72%	200	10%	136	7%	1312	65%	41	2%	168	8%	294	15%	61	3%	219	11%
2025	2	2766	137%	132	7%	29	1%	1039	51%	36	2%	293	14%	875	43%	114	6%	206	10%
2025	3	2741	135%	52	3%	44	2%	8	0%	45	2%	265	13%	357	18%	312	15%	285	14%
2025	4	320	16%	63	3%	204	10%	62	3%	103	5%	128	6%	87	4%	115	6%	301	15%
2025	5	146	7%	52	3%	126	6%	103	5%	88	4%	97	5%	54	3%	142	7%	136	7%
2025	6	237	12%	218	11%	127	6%	8	0%	42	2%	91	4%	36	2%	362	18%	-	-
2025	7	309	15%	218	11%	25	1%	57	3%	274	14%	97	5%	46	2%	265	13%	47	2%
2025	8	980	48%	42	2%	13	1%	161	8%	241	12%	73	4%	26	1%	22	1%	125	6%
2025	9	624	31%	104	5%	25	1%	27	1%	187	9%	329	16%	211	10%	52	3%	117	6%
2025	10	92	5%	24	1%	37	2%	33	2%	134	7%	265	13%	412	20%	188	9%	77	4%
2025	11	59	3%	16	1%	1406	69%	28	1%	27	1%	121	6%	117	6%	54	3%	743	37%
2025	12	76	4%	36	2%	24	1%	79	4%	22	1%	143	7%	85	4%	105	5%	954	47%
2025	13	78	4%	113	6%	18	1%	69	3%	16	1%	129	6%	128	6%	244	12%	219	11%
2025	14	382	19%	188	9%	38	2%	84	4%	13	1%	143	7%	133	7%	65	3%	116	6%
2025	15	1560	77%	130	6%	29	1%	60	3%	14	1%	329	16%	215	11%	128	6%	60	3%
2025	16	938	46%	317	16%	63	3%	9	0%	11	1%	499	25%	194	10%	22	1%	71	4%
2025	17	504	25%	141	7%	11	1%	12	1%	34	2%	597	29%	174	9%	85	4%	85	4%
2025	18	79	4%	163	8%	24	1%	59	3%	43	2%	319	16%	144	7%	101	5%	353	17%
2025	19	100	5%	44	2%	30	1%	44	2%	105	5%	85	4%	227	11%	214	11%	651	32%
2025	20	97	5%	31	2%	179	9%	97	5%	181	9%	132	7%	177	9%	648	32%	195	10%
2025	21	411	20%	40	2%	33	2%	21	1%	327	16%	94	5%	181	9%	611	30%	58	3%
2025	22	371	18%	22	1%	39	2%	15	1%	39	2%	188	9%	125	6%	107	5%	50	2%
2025	23	-	-	25	1%	86	4%	20	1%	12	1%	426	21%	1047	52%	91	4%	74	4%
2025	24	107	5%	26	1%	127	6%	15	1%	35	2%	500	25%	494	24%	11	1%	143	7%
2025	25	67	3%	28	1%	39	2%	112	6%	85	4%	135	7%	147	7%	37	2%	371	18%
2025	26	233	12%	58	3%	19	1%	44	2%	178	9%	154	8%	392	19%	103	5%	1005	50%
2025	27	49	2%	341	17%	13	1%	35	2%	26	1%	127	6%	204	10%	519	26%	2109	104%
2025	28	58	3%	36	2%	8	0%	38	2%	26	1%	174	9%	54	3%	556	27%	101	5%
2025	29	311	15%	41	2%	13	1%	4	0%	15	1%			244	12%	92	5%	198	10%
2025	30	443	22%	86	4%	7	0%	35	2%	21	1%			375	19%	46	2%	200	10%
2025	31			20	1%			47	2%	44	2%			312	15%			397	20%
	AVERAGE	**538**	**27%**	**97**	**5%**	**99**	**5%**	**121**	**6%**	**80**	**4%**	**218**	**11%**	**244**	**12%**	**182**	**9%**	**322**	**16%**

[1] Counts provided by Los Angeles County Department of Beaches and Harbors.

APPENDIX FIGURE D-1
PARKING SUPPLY AND DEMAND