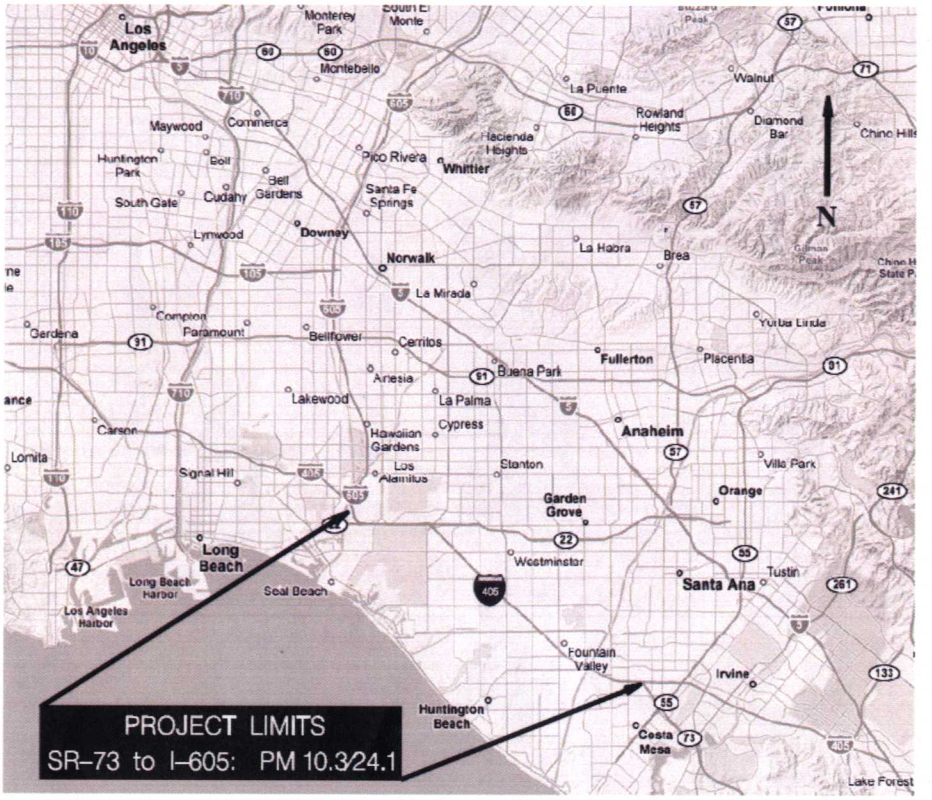
PROJECT STUDY REPORT/
PROJECT DEVELOPMENT SUPPORT



On Interstate Route 405 from State Route 73 to I-605

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Contents

Attachments

1. Cost Estimates
2. Right-of-way Data Sheet, Utility Information Sheet, and Railroad Information Sheet
3. Railroad Correspondence
4. Project Initiation Document Design Scoping Index
5. PDS Traffic Forecasting, Analysis and Operations Scoping Checklist
6. Division of Engineering Services PSR(PDS) Scoping Checklist
7. Storm Water Data Report
8. Drainage Report
9. Year 2030 Mainline Peak Hour Travel Demand Traffic Volume Forecasts
10. Preliminary Environmental Assessment Report
11. TASAS Table B
12. Planning Scoping Checklist
13. Cooperative Agreement between Department of Transportation and OCTA for PA/ED

Separately Bound: Layout Plans
Interchange Traffic Analysis Report for I-405 Freeway PSR/PDS
Preliminary Utility Investigation Report for I-405
Initial Site Assessment

Tables

Figures

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1 INTRODUCTION

The proposed project would add general purpose lanes in each direction to the parts of Interstate 405 (I-405) in Orange County between State Route 73 (SR-73) and Interstate 605 (I-605). These lanes would improve lane continuity through the corridor. Two build alternatives are being considered for the proposed project. Build Alternative 1 would add a single general purpose freeway lane in each direction of I-405 from Euclid Street to the I-605 interchange. Build Alternative 2 would add the general purpose lane included in Alternative 1 and a second general purpose lane northbound from Brookhurst Street to the State Route 22 (SR-22)/7th Street interchange and southbound from Seal Beach Boulevard to Brookhurst Street. Both of these alternatives would provide other improvements, including auxiliary lanes that link upstream on-ramps with downstream off-ramps and local interchange improvements as described below.

The local street interchanges along the corridor would be upgraded through reconfiguration and reconstruction to provide:

- left- and right-side shoulders for on-/off-ramps;
- increased ramp storage capacity for on-/off-ramps;
- additional through and turn lanes at ramp intersections with local streets; and
- removal of high-occupancy vehicle (HOV) bypass lanes from on-ramps, subject to individual analysis of each on-ramp during the PA/ED phase and approval by the Department of Transportation and the Federal Highway Administration (FHWA);.

Additionally, the two build alternatives would include the following interchange improvements:

- a new on-ramp from eastbound Ellis Avenue to southbound I-405;
- reconfiguration of the Brookhurst Street interchange;
- braided ramps in both directions at Magnolia Street/Warner Avenue;
- braided ramps in both directions at Beach Boulevard; and
- reconfiguration of the existing northbound off-ramp to eastbound Westminster Avenue.

The proposed project would require the replacement of 16 arterial overcrossing bridges and a pedestrian bridge because their current spans are insufficient to accommodate additional lanes on the freeway beneath. Two undercrossings and two railroad overheads would also require widening. As shown in Table 1, the capital construction costs of the proposed alternatives range from $1.11 billion to $1.85 billion.

Table 1 Project Information	
Project Limits Dist., Co., Rte., PM)	12-ORA-405-PM 10.3/24.1
Number of Alternatives	2 Build Alternatives
Capital Outlay Support for PAED (estimated as 1 percent of construction costs of more costly alternative)	$10.72 million
Capital Construction Cost Range (excluding No Build Alternative)	$1.11 billion to $1.85 billion
Right-of-Way Cost Range (excluding No Build Alternative)	$43 million to $272 million
Funding Source	Renewed Measure M and other unidentified sources
Type of Facility (conventional, expressway, freeway)	Freeway
Number of Structures	28 Bridges 19 Retaining Walls 23 Soundwalls
Anticipated Environmental Determination or Document	Environmental Impact Report (EIR)/ Environmental Impact Statement (EIS)
Project Category	Category 3

2 BACKGROUND

This section describes the historical background of the I-405 freeway including the activities leading up to the proposed project improvements as well as the existing lane configuration along the freeway.

2.1 Historical Background

I-405 (also known as the San Diego Freeway) has 24 miles in Orange County and 48 miles in Los Angeles County. It is considered a bypass route to the Santa Ana/Golden State Freeway (I-5). Within the proposed project limits in Orange County, I-405 is a controlled-access freeway with 8 to 12 mixed-flow general purpose lanes and 2 HOV lanes. Additionally, there are auxiliary lanes along selected portions of the route.

I-405, within the proposed project limits, serves the beach communities of northern Orange County, including parts of the cities of Costa Mesa, Fountain Valley, Huntington Beach, Westminster, Garden Grove, and Seal Beach. The community of Rossmoor, which is an unincorporated area of Orange County, and the United States Navy's Seal Beach Naval Weapons Station are also served by I-405 within the proposed project limits. I-405 overlaps with SR-22

and intersects I-605 at the northern limit of the proposed project. Twelve service interchanges and two system interchanges with SR-73 and State Route 22 (SR-22) occur within the proposed project limits.

I-405 was originally added to the State Highway System in 1933 and to the Freeway and Expressway System in 1959. Construction began in 1964 and was completed in 1969. Within the limits of the proposed project, the original construction provided four general purpose lanes in each direction. The addition of an HOV lane in each direction was completed in 1991.

I-405 is part of the National Highway System (NHS), and it provides access between cities in Orange and Los Angeles counties. The freeway is used for commuting and intraregional travel, along with direct and indirect access to employment centers, recreational attractions, shopping malls, medical centers, universities, airports, and other land uses.

A Major Investment Study (MIS) for the corridor was completed in 2006. The Orange County Transportation Authority (OCTA) Board of Directors adopted a resolution supporting a Locally Preferred Strategy (LPS) of improvements to the I-405 corridor in northern Orange County that consists of adding a single lane in each direction and auxiliary lanes at selected locations. A major consideration in the selection of the improvement alternative was its limited right-of-way (ROW) acquisition impacts. The OCTA Board indicated that other alternatives with similar or fewer ROW impacts could be considered in the project development process.

The MIS process, as well as the Project Study Report/Project Development Support (PSR/PDS) process, included participation by municipalities along the corridor in the form of attendance at Project Development Team (PDT) meetings by city/California Department of Transportation/OCTA staff and at Policy Working Group meetings by elected city officials. Individual meetings were held with city and Department of Transportation staff to seek input on potential improvements to interchanges within the proposed project limits that would affect local arterial streets. The MIS process included an extensive public involvement process. OCTA funded and managed the MIS and PSR/PDS processes with Department of Transportation oversight.

2.2 Existing Lane Configurations

Within the proposed project limits, I-405 is composed of four segments. Each segment has different lane geometry and a unique cross section, resulting in distinct operational problems and proposed improvements specific to the segment. The existing conditions of these segments are as follows:

- **Segment 1: From SR-73 north to Euclid Street –** The typical section in Segment 1 consists of a single high-occupancy vehicle (HOV) lane and six or seven general purpose lanes in each direction, with auxiliary lanes and braided ramps serving interchanges at Fairview Road Harbor Boulevard, and Euclid Street. South of SR-73 there are 5 northbound travel lanes including an HOV lane. Three lanes from SR-73 northbound join I-405 northbound, providing a total of eight northbound lanes on I-405 just north of SR-73. Each of the three lanes added from SR-73 are subsequently dropped. The first lane is dropped just north of the Fairview overcrossing at PM 11.0. The second lane is dropped

at the Euclid Street off-ramp. The third lane is dropped at the Brookhurst Street off-ramp. In the southbound direction there are three corresponding lane additions: one at the Brookhurst Street on-ramp, one at the Euclid Street on-ramp, and one at the southbound Harbor Boulevard on-ramp. Portions of this section of I-405 were reconstructed as part of the I-405/ SR-73 improvements, which were completed in July 2004.

Figure 1 represents the existing typical cross section of Segment 1, north of the first lane drop, where each direction has six general purpose lanes, one HOV lane, and auxiliary lanes at some locations.

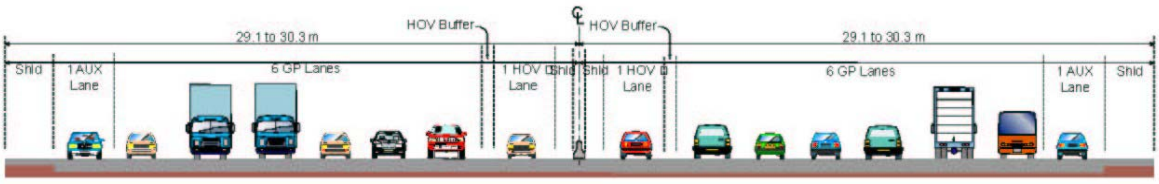

Figure 1. Existing Typical Section in Segment 1 North of the First Lane Drop

- **Segment 2: From Euclid Street to Brookhurst Street –** The typical section in Section 2 consists of a single HOV lane and five general purpose lanes. Figure 2 represents the existing typical section in Segment 2.

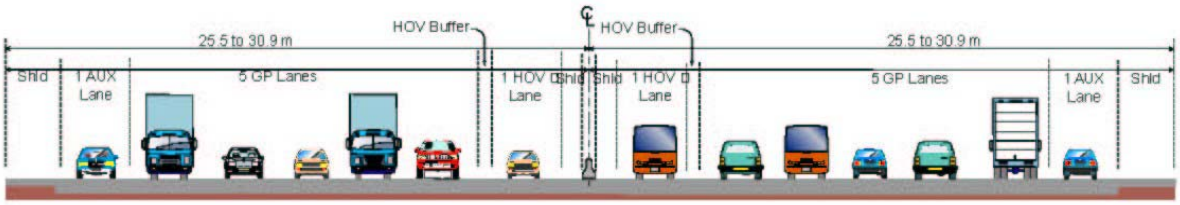

Figure 2. Existing Typical Section in Segment 2 between Euclid Street and Brookhurst Street

- **Segment 3: From Brookhurst Street to Valley View Street** – There are four general purpose lanes and one single HOV lane in each direction of Segment 3. An auxiliary lane in each direction between the Beach Boulevard and Magnolia Street/Warner Avenue interchange was opened to traffic in June 2008. There are no other auxiliary lanes in this segment. Figure 3 illustrates the existing typical section in Segment 3. This segment has interchanges at Warner Avenue; Magnolia Street; Edinger Avenue; Beach Boulevard, including ramps terminating at Center Avenue; Bolsa Avenue; Goldenwest Street; Westminster Boulevard, including a ramp terminating on Willow Lane; Springdale

Street; Garden Grove Boulevard; and Valley View Street. This segment has the least number of travel lanes in the study area.

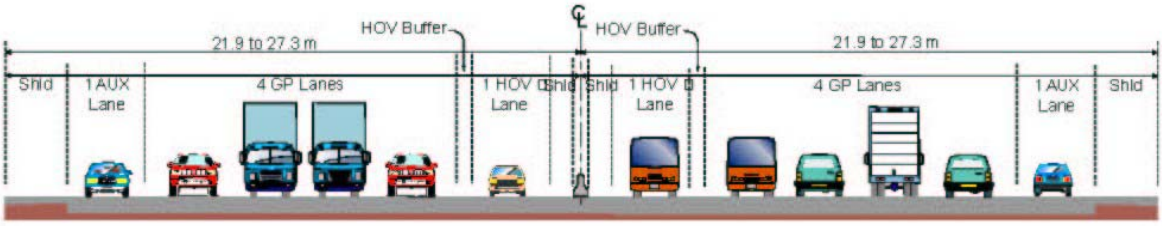

Figure 3. Existing Typical Section in Segment 3 between Brookhurst Street and Valley View Street

- **Segment 4: From Valley View Street to 7th Street** – SR-22 converges with I-405 at Valley View Street and continues as one facility to the SR-22/7th Street ramps, where SR-22 and I-405 diverge. There are six general purpose lanes and a single HOV lane in each direction in the SR-22 overlap section. There is a lane drop on I-405 at the SR-22 (7th Street) ramps in the northbound direction, and a lane is added in the southbound direction. There is a southbound auxiliary lane from the SR-22 (7th Street) entrance ramp to the Seal Beach Boulevard exit ramp. North of the SR-22 (7th Street) ramps to I-605, there are five general purpose lanes and a single HOV lane in each direction. There is a lane drop at I-605 in the northbound direction, and a lane is added in the southbound direction. North of I-605 in Los Angeles County, I-405 has four general purpose lanes and one HOV lane in each direction.

  Figure 4 represents the typical section on I-405 between SR-22 (near Valley View Street) and SR-22/7th Street expected after the completion of the SR-22 West County Connectors (SR-22 WCC) project (EA 071621 and 072631). These projects are currently in the Plans, Specifications, and Estimates (PS&E) phase and are scheduled to start construction in 2010, as noted below in the last full paragraph of Section 5. The typical section will have six general purpose lanes and two HOV lanes in each direction. This segment will also continue to have one auxiliary lane between 7th Street and Seal Beach Boulevard in the southbound direction.

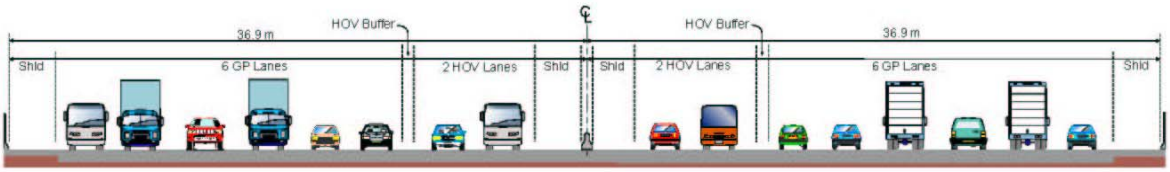

Figure 4. Typical Section on I-405 along SR-22 Overlap portion of Segment 4 after Completion of the SR-22 WCC Project

3 NEED AND PURPOSE STATEMENT

This section summarizes the need for and purpose of the proposed project.

3.1 Need

The need for the proposed improvements is based on four principal problems.

First, demand currently exceeds capacity during peak periods, which results in travel delays (defined as level-of-service [LOS] E or F) along the corridor within the proposed project limits. Forecasted population and employment growth between the years 2005 and 2030 in the cities along I-405 in northern Orange County are expected to result in traffic growth of approximately 20 percent on I-405 within the proposed project limits, based on traffic forecasts from the Orange County Transportation Analysis Model (OCTAM). See Section 0 for a discussion of the project design year.

Travel times on I-405 between SR-73 and I-605 currently range from 13 minutes in free-flow conditions to 49 minutes during the most heavily congested times of day. Travel times are forecast to increase to more than 60 minutes in year 2030 based on a traffic simulation analysis of the corridor prepared by OCTA. Average travel speeds during peak hours currently range from 17 to 35 miles per hour (mph) depending upon the direction of travel and time of day. Peak hour speeds are expected to degrade to a range of 13 to 19 mph in year 2030.

Second, operational problems occur on the freeway primarily because of physical bottlenecks. There are three locations in the corridor where general purpose lanes terminate. In the northbound direction, “lane drops” occur just north of the Fairview Road overcrossing (PM 11.0), at the Euclid Street interchange (PM 12.4), and at the Brookhurst Street interchange (PM 13.8). These latter two lane drops occur at interchanges that are adjacent to one another. The drop of three general purpose lanes in approximately 2.4 miles creates peak-period back ups of traffic that routinely extend through the SR-73 and SR-55 interchanges as far south as Jamboree Road (PM 6.92), which is a distance of nearly 7 miles.

Third, there are a variety of interchange and ramp deficiencies. Interchange ramps within the proposed project limits have limited storage capacity at ramp meters and signal-controlled off-ramps. Forecasted exit ramp traffic volume increases are expected to result in off-ramp queues from ramp/local street intersections that backup into the deceleration portion of freeway off-ramps at two locations: the I-405 northbound exit to Garden Grove Boulevard/Valley View Street/SR-22 Eastbound/Bolsa Chica Road and the I-405 southbound exit to Center Avenue at the Beach Boulevard interchange. There is inadequate storage at many metered on-ramp locations, which results in regular queues of vehicles entering the freeway backing onto local streets and, in some cases, across adjacent intersections. Beach Boulevard and Brookhurst Street have collector-distributor (C-D) roads with cloverleaf interchange configurations that require weaving of lower-speed traffic entering the C-D road from ramp meters with higher-speed traffic exiting the freeway. There is a nonstandard weaving length on the southbound freeway mainline between the Magnolia Street on-ramp and the Warner Avenue off-ramp. Finally, the more heavily traveled on-ramps merging onto the freeway cause heavy traffic congestion during peak periods, as shown in Figure 5.

Figure 5. Existing Peak Period Congestion on I-405 at the Goldenwest Street/Bolsa Avenue Southbound On-Ramp

Fourth, some existing geometric and operational deficiencies present potential safety concerns. Congestion on the freeway mainline resulting from demand that exceeds capacity, physical bottlenecks, interchange deficiencies, existing deficient weaving distances between ramps, and lack of storage capacity on ramps contribute to less than optimum safety conditions.

3.2 Purpose

The purpose of the proposed project is to meet four primary objectives and one secondary objective. The four primary objectives are to:

1. increase the capacity of the freeway to meet more of the existing and forecasted demand, increase peak period corridor speeds, and reduce peak period corridor travel times;
2. improve traffic operations on the freeway mainline;
3. enhance interchange operations; and
4. enhance safety.

The four primary objectives correspond to the four principal problems identified in Section 3.1. The first objective is to meet more of the existing and forecasted demand. It is unlikely that any

viable alternative would meet all of the forecasted demand, given the local opposition to ROW acquisition.

The secondary objective is to minimize the amount of ROW acquisition needed for the project. An LPS was adopted by the OCTA Board of Directors on October 14, 2005, as the culmination of the MIS conducted for the corridor. The *I-405 Major Investment Study Final Report* (February 2006) states (p. 93): "It is clear from the process used to identify Alternative 4 as the LPS that the selection of Alternative 4 was predicated upon a balance between its benefits and its impacts, *especially its right-of-way impacts*" (emphasis added). The preceding pages of that report (pp 85 *et seq.*) document the process used to select the LPS, and those pages have numerous references to concerns with minimizing ROW impacts. It was clear to the participants in the process that any alternative requiring extensive ROW acquisition would face adamant local and public opposition and implementation would be unlikely.

4 DEFICIENCIES

This section summarizes the deficiencies of I-405 within the proposed project limits. Existing traffic volumes and mainline lane configurations, including lane drops, are identified in Sections 4.1and 4.2. Existing and forecast mainline freeway LOS, travel time, and speed are described in Sections 4.3 and 0. Ramp queuing conditions are described in Section 4.5 and Section 4.6 summarizes accident data on the freeway mainline.

4.1 Existing Traffic Volumes

I-405, between SR-73 and I-605, is subdivided into three segments.

1. From SR-73 (PM 10.3) to Brookhurst Street (PM 13.8), I-405 has 12-16 lanes including 2 HOV lanes, with 16 lanes just north of SR-73 narrowing to 12 lanes just south of Brookhurst Street. Based on Caltrans data, year 2005 average annual daily traffic (AADT) volumes on this segment are approximately 375,000, as shown in Table 2. Trucks account for approximately 3 percent of the total volume throughout the entire project area based on Caltrans truck count data for year 2005.

2. From Brookhurst Street north the SR-22 East Interchange (PM 20.8), I-405 has 10 lanes, including 2 HOV lanes. Year 2005 AADT is 281,000.

3. From the SR-22 East Interchange to I-605 Interchange (PM 24.1), I-405 is generally 12-14 lanes wide including 2 HOV lanes. Between PM 20.8 and PM 23.3, the I-405 and SR-22 freeways overlap. The overlap segment is the widest and most heavily trafficked section of I-405 in Orange County with an AADT of 390,000 in year 2005.

4.2 Existing Lane Drops

Figure 6 schematically shows the northbound travel lanes along the freeway in the study corridor. The figure shows that the segment of I-405 from Brookhurst Street to SR-22 East has fewer general purpose lanes in each direction than the segments to its north and south. South of

Table 2
I-405 Segment Limits: Existing Lanes, Daily and Peak Hour Traffic Volumes

I-405 Segment	PM	Existing Number of Lanes: HOV + GP	Year 2005 Average Annual Daily Traffic Volume	Year 2005 Peak Hour Traffic Volume
Harbor Boulevard to Brookhurst Street	11.7/13.8	2+12*	375,000	28,500
Brookhurst Street to SR-22 East	13.8/ 20.8	2+8	281,000	22,100
SR-22 East to I-605	20.8/24.0	2+12**	390,000	29,000

PM = Postmile; HOV = High Occupancy Vehicle Lane; GP = General Purpose Lane

* 2+10 north of Euclid Street to Brookhurst Street

** Scheduled for widening to 4+12 with the construction of SR-22 Phase II HOV Lanes; existing is 2+10 north of SR-22 West interchange to I-605

Source of traffic volume data: 2005 Traffic Volumes on California State Highways, California Department of Transportation, Division of Traffic Operations

SR-73 there are 5 northbound travel lanes including an HOV lane. Three lanes from SR-73 northbound join I-405 northbound, providing a total of eight northbound lanes on I-405 just north of SR-73. Each of the three lanes added from SR-73 are subsequently dropped. The first lane is dropped just north of the Fairview overcrossing at PM 11.0. The second lane is dropped at the Euclid Street off-ramp. The third lane is dropped at the Brookhurst Street off-ramp. In the southbound direction there are three corresponding lane additions: one at the Brookhurst Street on-ramp, one at the Euclid Street on-ramp, and one at the southbound Harbor Boulevard on-ramp.

4.3 Existing Freeway Mainline LOS

An analysis of the existing LOS on I-405 from the SR-73 Interchange to the Los Angeles County line (just north of the I-605 Interchange) was conducted. Figures 3 through 6 show the peak hour LOS on I-405 based on an analysis of year 2005 peak hour traffic conducted by OCTA using the Freeway Corridor Simulation and Ramp Metering Optimization Model (FREQ). More detailed LOS analysis of merge points and weaving sections will be conducted during the PA/ED phase of project development.

In both the morning and evening peak hour, the three northbound lane drops between the SR-73 and Brookhurst Street interchanges contribute to a bottleneck at Brookhurst Street, with upstream LOS F conditions and queuing starting south of SR-73. The Brookhurst Street interchange has a C-D road which is used as a continuation of the fifth general purpose lane by some through traffic. Through traffic on the C-D road increases the volume of interchange traffic merging onto the freeway mainline at the northern end of the C-D road creating a jammed condition at the merge point. The jammed condition and lane drop at Brookhurst Street meter northbound traffic such that C-D roads at the next two interchanges to the north do not suffer the same jammed condition where C-D roads merge onto the freeway mainline.

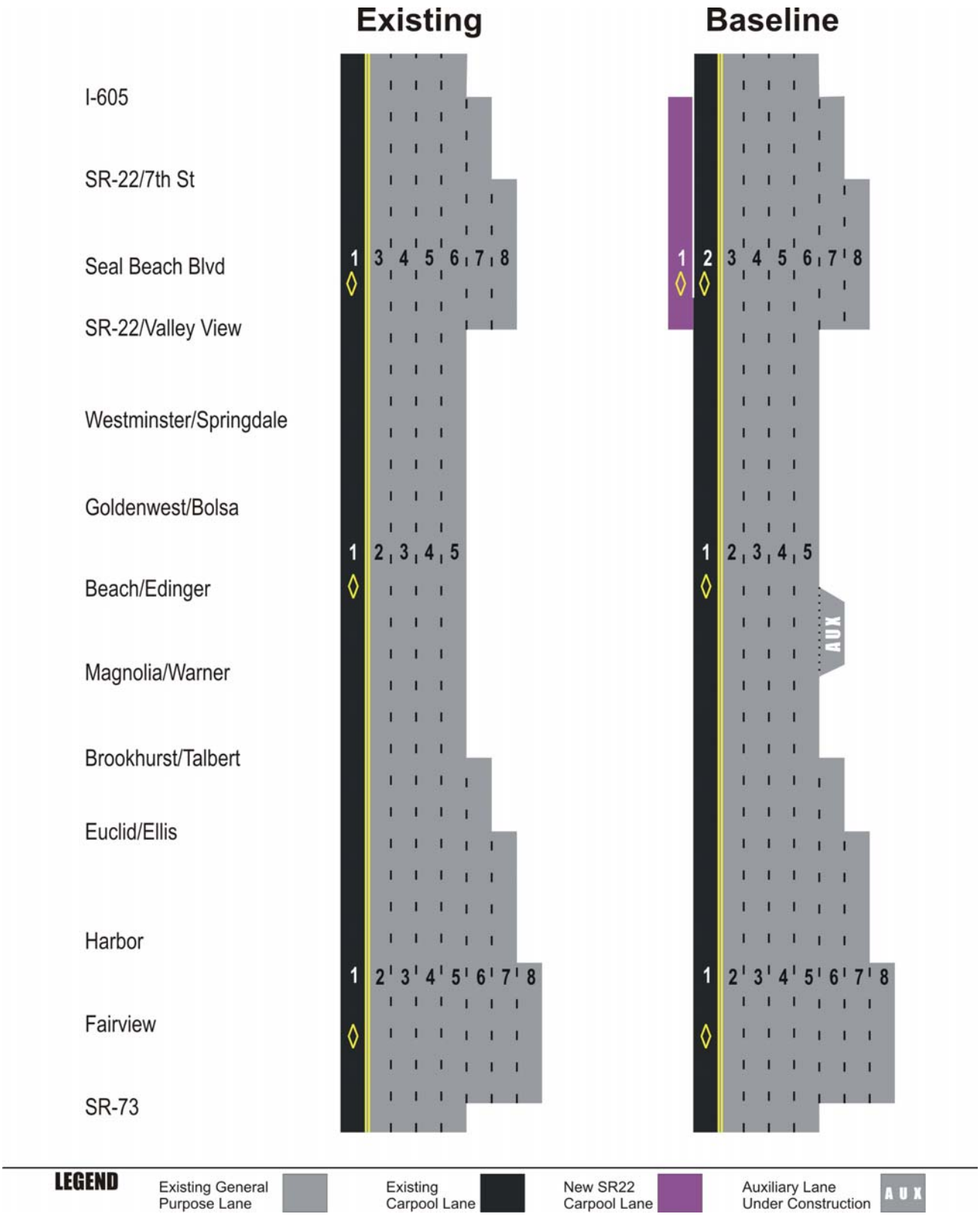

Figure 6. Schematic of Existing and Baseline (Future No Build) I-405 Lane Configuration

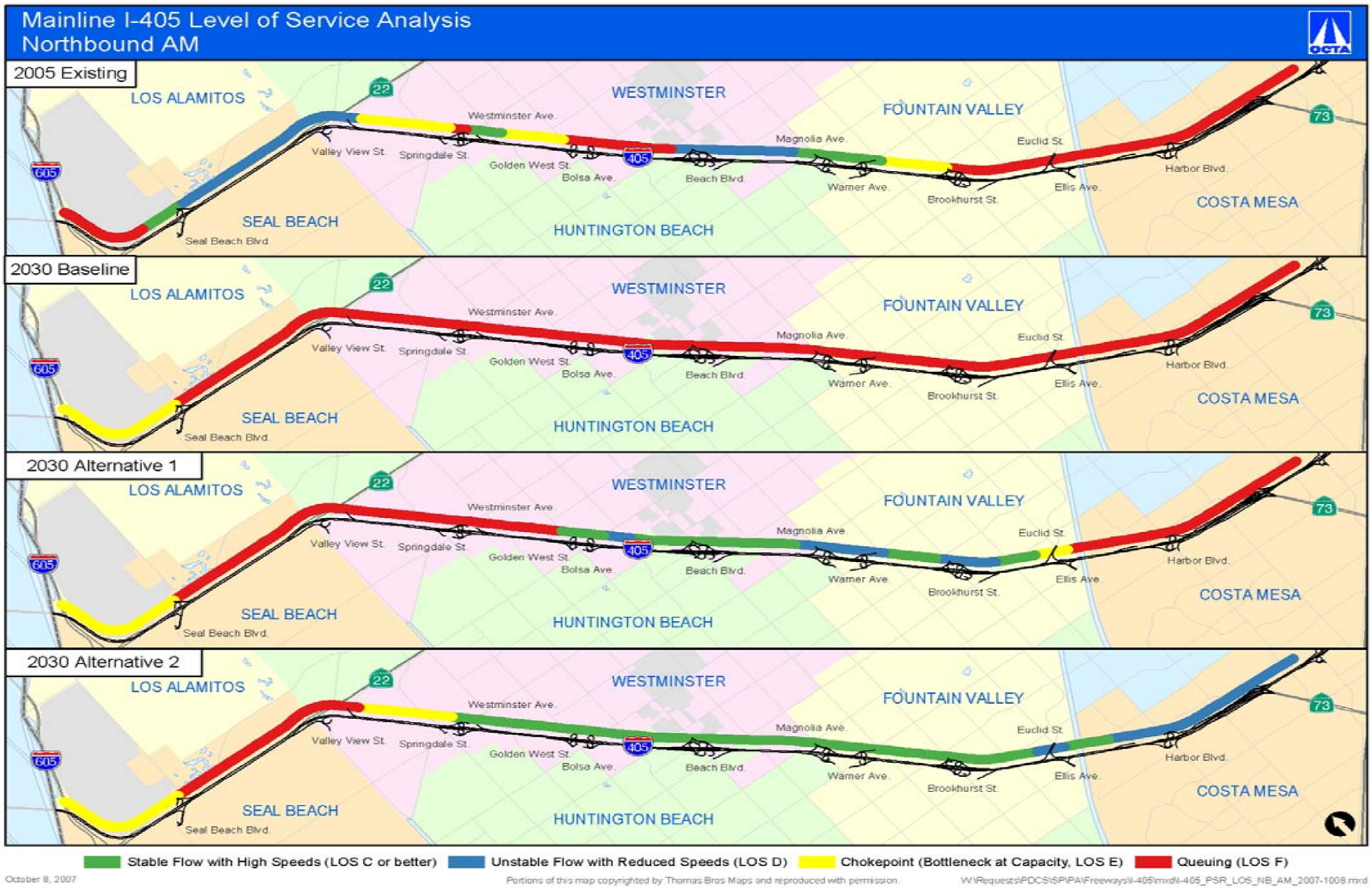

Figure 7. I-405 Mainline Freeway FREQ LOS Analysis: Northbound AM Peak Hour

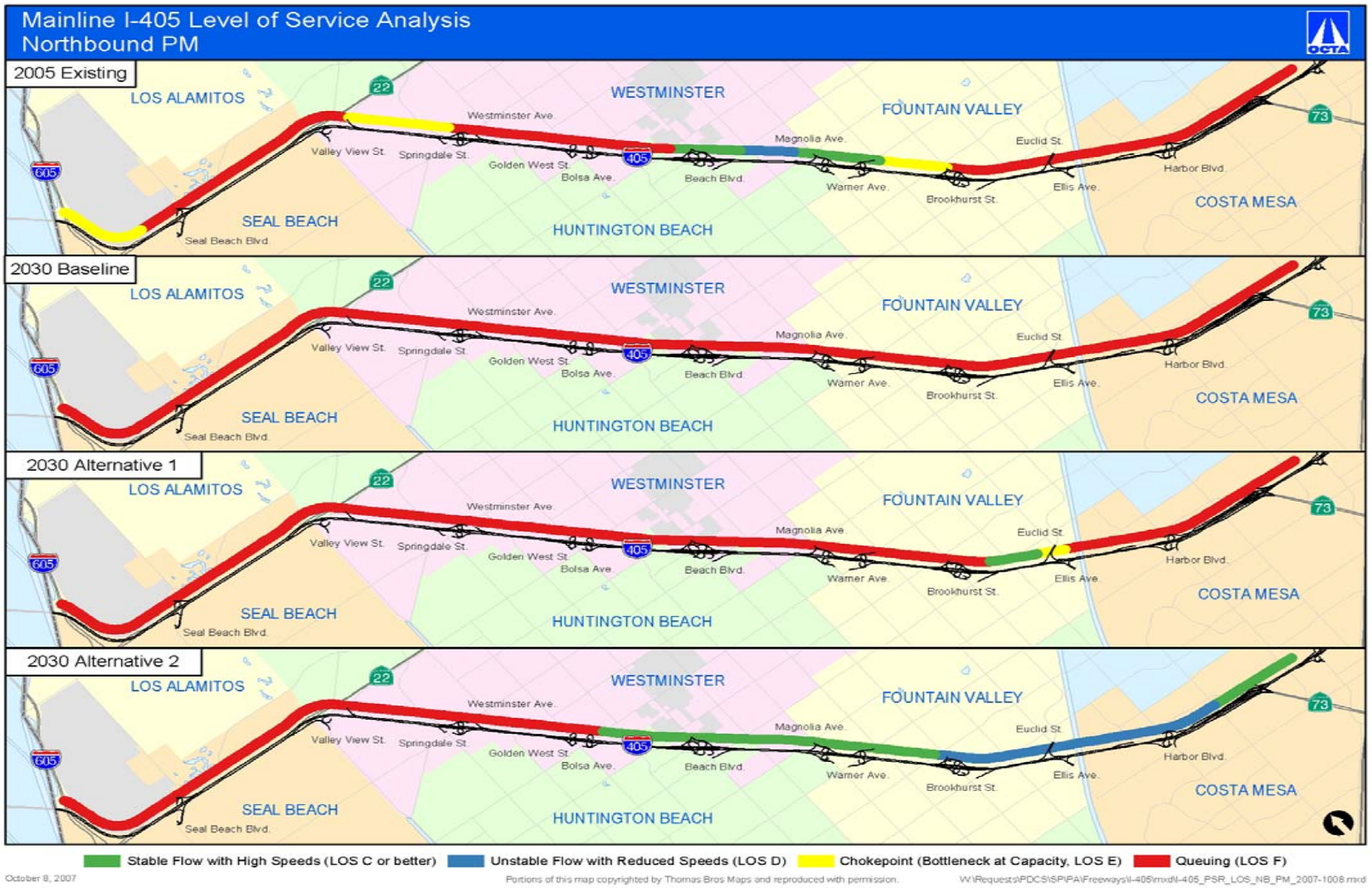

Figure 8. I-405 Mainline Freeway FREQ LOS Analysis: Northbound PM Peak Hour

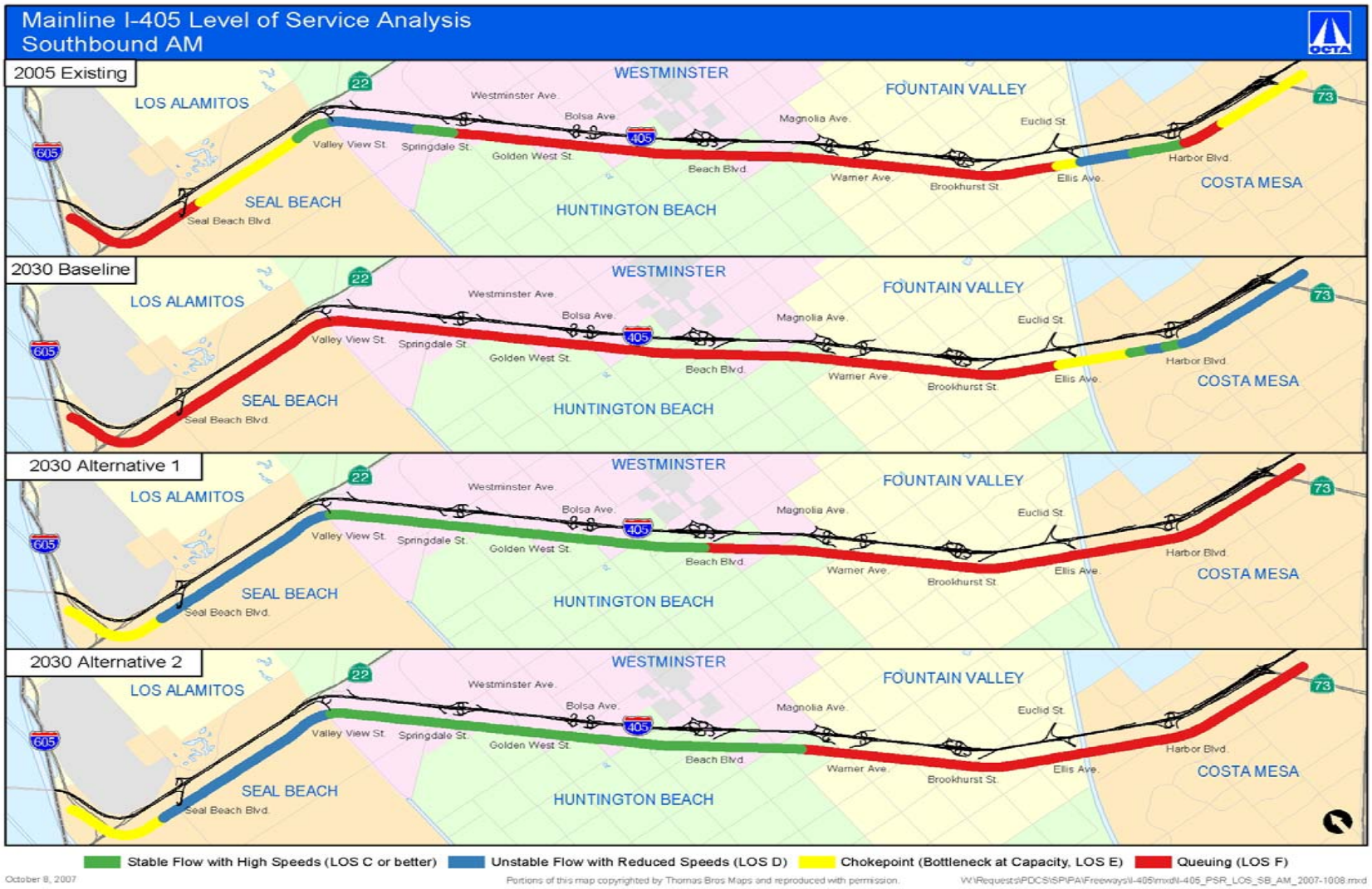

Figure 9. I-405 Mainline Freeway FREQ LOS Analysis: Southbound AM Peak Hour

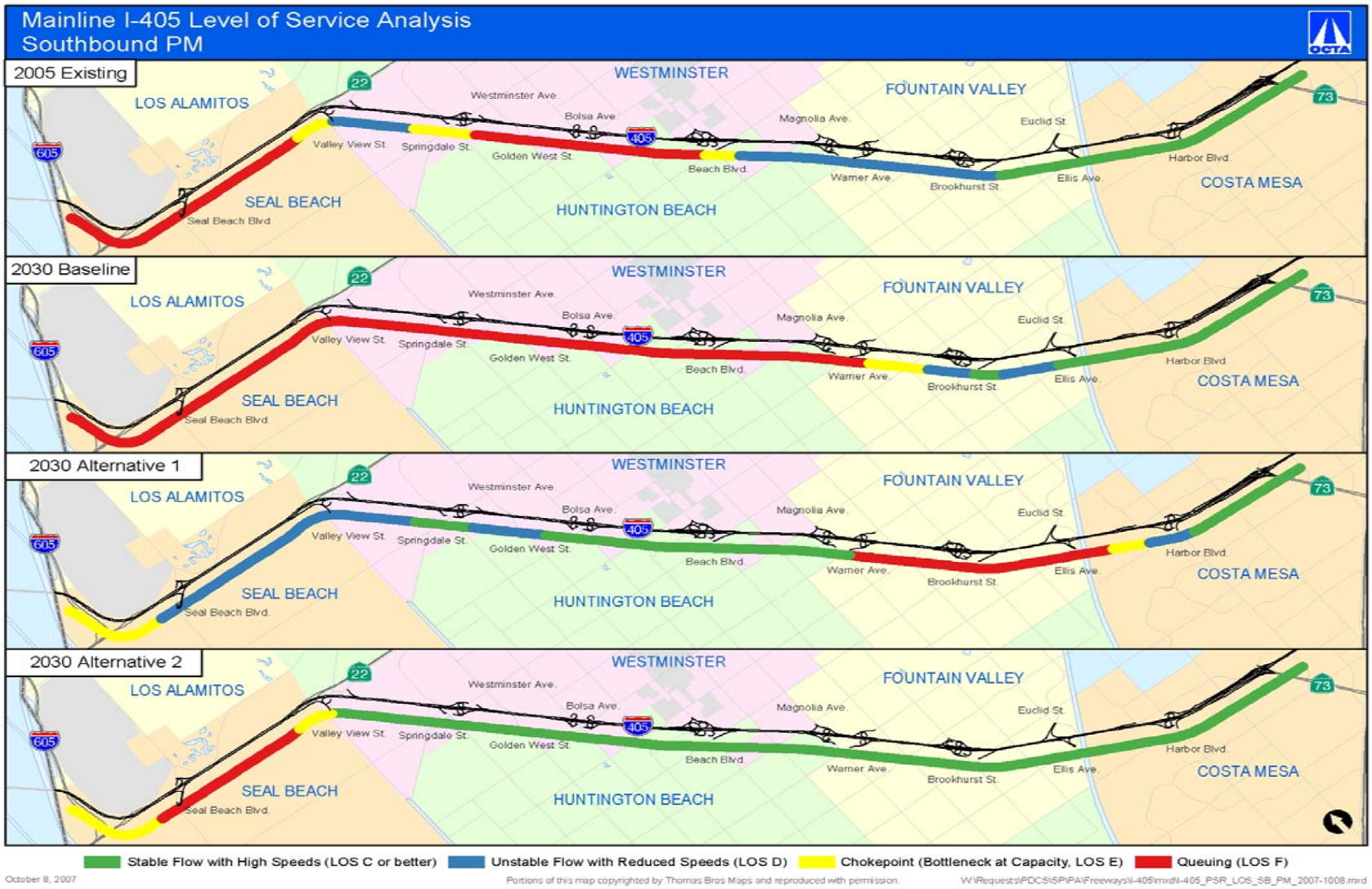

Figure 10. I-405 Mainline Freeway FREQ LOS Analysis: Southbound PM Peak Hour

North of Beach Boulevard to I-605, traffic operates at LOS E or F during the evening peak hour. During the morning peak hour, some portions of this segment of I-405 operate at LOS E or F, while others achieve LOS D or better. Jammed conditions at merge points occur at entrance ramps from Bolsa Avenue, Goldenwest Street, Westminster Avenue, and SR-22 East during one or both of the peak hours. These conditions result from the combination of on-ramp and mainline volumes exceeding freeway capacity, yielding LOS E conditions downstream of the merge points, which spill back and create LOS F conditions upstream of the merge points.

In the southbound direction during the morning peak hour, LOS F operations occur from I-605 to the Seal Beach Boulevard interchange. This condition results from the combination of on-ramp and mainline volumes exceeding freeway capacity, yielding LOS E conditions downstream of the merge point, which spills back creating LOS F conditions upstream of the merge point. . LOS F conditions also prevail southbound from the Westminster Avenue interchange to the Euclid Street interchange during the morning peak hour. During the evening peak hour, LOS F conditions prevail from I-605 to SR-22 East due to traffic maneuvers occurring at the SR-22 eastbound divergence and the Bolsa Chica Road on-ramp. Jammed conditions are created at the Beach Boulevard C-D road merge with the I-405 southbound mainline, resulting from the combination of on-ramp and mainline volumes exceeding freeway capacity. This causes LOS E at the merge point spilling back and creating LOS F conditions upstream to Westminster Avenue. South of Beach Boulevard the southbound freeway operates at LOS D or better during the evening peak hour.

The time needed to travel the corridor in each direction during the peak hours in years 2005 and 2030 (Baseline) is summarized in Table 3. To travel the 13.7 miles from SR-73 to I-605 requires 22 to 49 minutes during the peak hour, depending upon the direction of travel and time of day. Average travel speed in the corridor during the peak hours ranges from 17 to 35 mph.

Table 3
I-405 Existing Year 2005 and Baseline (No Build) Year 2030
Mainline Peak Hour Travel Time and Speed: SR-73 to I-605

	Travel Time*		Travel Speed**	
	2005 Existing	2030 Baseline	2005 Existing	2030 Baseline
Northbound AM Peak Hour	35	53	24	16
Northbound PM Peak Hour	49	64	17	13
Southbound AM Peak Hour	41	61	19	13
Southbound PM Peak Hour	22	40	35	19

* Travel time in minutes

** Travel speed in miles-per-hour

Source: FREQ model prepared by OCTA

In short, several locations along I-405 within the proposed project limits currently operate under LOS F conditions during the peak hours.

4.4 Forecast Freeway Mainline LOS

The design year used for the PSR/PDS is 2030 as approved by the PDT. Year 2030 is the current forecast year for OCTAM and the horizon year for the SCAG Regional Transportation Plan. The design year will be revised during the PA/ED process. OCTAM is expected to be updated to a forecast year of 2035 and be ready for use in the PA/ED phase. OCTAM forecasts will be adjusted to the appropriate design year during the PA/ED phase. Based on the current schedule presented in Section 1, project completion is scheduled for year 2019, indicating a design year of 2039 for consideration in subsequent phases of project development. The design year used in the PA/ED phase of the project will be determined by the Project Development Team in the initial stages of the PA/ED phase.

With the forecast growth of traffic by 20 percent from year 2005 to year 2030, LOS is expected to degrade further, even with implementation of the following two committed projects in the corridor:

- an additional HOV lane in each direction between SR-22 East and I-605, including HOV direct connectors at I-405/SR-22 East and I-405/I-605; and
- auxiliary lanes in both directions between the Magnolia Street and Beach Boulevard interchanges linking upstream on-ramps with downstream off-ramps.

During the morning and evening peak hours in year 2030, northbound traffic is forecast to operate at LOS F in the entire corridor, except from Seal Beach Boulevard to I-605 in the morning peak hour, which is forecast to operate at LOS E. Southbound traffic is forecast to operate at LOS F from I-605 to Warner Avenue in the morning peak hour and from I-605 to Euclid Street in the evening peak hour.

Corridor travel time is forecast to increase during the peak hours to a range of 40 to 64 minutes to travel the 13.7-mile corridor from SR-73 to I-605, as shown in Table 3. Average travel speed in the corridor is forecast to fall to a range of 13 to 19 mph.

4.5 Ramp Queuing

Field observation reveals that queuing at ramp meters currently spills back onto the local streets at the following locations during peak hours:

- northbound Beach Boulevard on-ramp to northbound I-405,
- eastbound Edinger Avenue on-ramp to southbound I-405,
- southbound Magnolia Street on-ramp to southbound I-405,
- eastbound Warner Avenue on-ramp to southbound I-405,
- southbound Brookhurst Street on-ramp to southbound I-405,
- eastbound Talbert Street on-ramp to southbound I-405, and
- Euclid Street/Ellis Avenue on-ramp to southbound I-405.

In some of these locations, the queuing affects the operations of adjacent arterial/arterial intersections because of their proximity to the freeway ramps and the extent of the queuing. These conditions are expected to degrade because of traffic growth in the corridor.

Queuing of exit ramps onto the freeway mainline occurs infrequently, but it has been observed at the I-405 northbound exit to Garden Grove Boulevard/Valley View Street/SR-22 Eastbound/ Bolsa Chica Road. By the year 2030, this location is forecast to have regular queuing extending into the deceleration portion of the exit ramp approximately 200 feet downstream of the gore point. Available storage is approximately 390 feet, and the forecasted need is for approximately 620 feet (see *Interchange Traffic Analysis Report for Interstate 405 Freeway Project Study Report/Project Development Support*).

A similar condition is forecast for the southbound I-405 exit to Center Avenue at the Beach Boulevard interchange. The exit ramp is forecast to have a demand for 380 feet of storage for the left turn at the end of the ramp onto Center Avenue toward Beach Boulevard. Only 370 feet of storage are available. While this condition is marginal, inadequate storage at the downstream intersection of Center Avenue and Beach Boulevard will exacerbate it. The right-turn queue from Center Avenue to southbound Beach Boulevard is forecast to be 690 feet, which will back across the ramp terminal intersection that is 550 feet away. Additional queuing will take place on the exit ramp and increase the demand for storage beyond what is available and extend into the deceleration area of the off-ramp.

4.6 Accident History

District 12 of the Department of Transportation provided the Traffic Accident Surveillance and Analysis System (TASAS) data for the mainline portion of I-405 between SR-73 and I-605 for the 36-month period from January 1, 2004, through December 31, 2006. A summary of these accident data is presented in Table 4.

Table 4
I-405 Three-Year Total Accidents and Severity

	Number of Accidents			Actual Rates (per million vehicle miles)			Average Rate Statewide (per million vehicle miles)		
Location	Total	Fatal	Fatal + Injury	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total
Northbound PM 10.513/24.176	2335	13	611	0.005	0.26	0.98	0.006	0.38	1.24
Southbound PM 10.513/24.176	1990	5	543	0.002	0.23	0.83	0.006	0.38	1.24

Source: Caltrans TASAS Data: January 1, 2004 to December 31, 2006

A comparison of the actual accident rates on I-405 with the average statewide accident rates indicates that both fatality and injury rates are below the statewide average. A review of the TASAS accident data reveals that rear-end collisions are the most prevalent. Rear-end accidents account for 58.3 percent (1,161 out of 1,990) of accidents in the southbound direction and 63.3 percent (1,477 out of 2,335) of accidents in the northbound direction. The secondary pattern of side-swipe accidents accounts for 20.3 percent (404 out of 1990) of accidents in the southbound direction and 18.2 percent (426 out of 2335) of accidents in the northbound direction. The prevalence of these accident types is to be expected because of the amount of congestion experienced during the peak periods. Hit-object accidents account for 17.0% (339 out

of 1990) of accidents in the southbound direction and 13.8% (323 out of 2335) of accidents in the northbound direction. Rear-end, side-swipe, and hit-object accidents account for 95.5% of accidents for both directions combined. All of the other accident types (head-on 0.3%, broad-side 1.6%, over-turn 1.2%, auto-pedestrian 0.1%, other 0.9%, and not-stated 0.5%) combined account for the remaining 4.5% of accidents, and each type accounts for less than 2.0% of all accidents.

There are a significant number of night fatal collisions in the upper portion of Route 405, amounting to 13 fatal collisions in the northbound roadbed and 5 fatal collisions in the southbound roadbed. The Department of Transportation implemented a safety project and installed light standards in the median and outside shoulders to light up both roadbeds of the I-405 between Valley View and the I-605 as a countermeasure to these nighttime collisions. This improvement was open-to-traffic in mid 2007 and seems to have had a positive impact on the night accident problem. With the implementation of the Department of Transportation's safety project, it is expected that the actual fatal accident rate will drop significantly, well below the average statewide fatal accident rate of 0.006 per 100 million vehicle miles.

The proposed project to relieve congestion by widening I-405 and braiding and reconstructing interchanges within the proposed project limits is expected to reduce these congestion related collisions on the mainline of I-405 and reduce interchanges collisions due to weaving maneuvers eliminated by braiding.

5 CORRIDOR AND SYSTEM COORDINATION

The proposed project is included in the Southern California Association of Governments 2004 Regional Transportation Plan (RTP) as project ORA030605. The project was added to the RTP in Amendment #3, which was adopted June 7, 2007. The project is included in the RTP for study only. The project description would "construct on additional general purpose lane in each direction on I-405 and provide additional improvements from SR-73 to LA County line…" (2004 RTP Amendment #3, page 13).

The Department of Transportation prepared a Route Concept Report (RCR) for I-405 in Orange County in November 1999. The report states "The concept for this route is to provide the best LOS possible and reduce the duration of congestion. If no major capital improvements are made, it is anticipated longer delays will occur" (p. i). The RCR divides I-405 in Orange County into segments. The route concept for the segments within the proposed project limits are presented in Table 5. The RCR includes a minimum of ten general purpose lanes on I-405 from SR-73 to SR-22 East. Currently, there are eight general purpose lanes between Brookhurst Street and SR-22 East. The RCR is an internal planning document which expresses the Department of Transportation's judgment on what the characteristics of each state highway should be in response to proposed land use and projected travel demand over a 20-year planning period. Information contained in the RCR is subject to change as conditions and priorities change and as new information is obtained. The nature and size of identified improvements may change as they move through the project development stages, with final determination made at the time of project planning and design.

Table 5
I-405 1999 Route Concept Report Lanes SR-73 to Los Angeles County Line

Segment	PM	Route Concept Lanes		
		General Purpose	HOV	Auxiliary
SR-73 to Beach Boulevard	10.8/16.5	10-12	2	Yes
Beach Boulevard to SR-22 East	16.5/20.8	10	2	Yes
SR-22 East to Los Angeles County Line	20.8/24.2	8-12	4	No

Source: Caltrans, "Route Concept Report: Interstate 405, San Diego Freeway, 12- ORA PM 0.23/24.18", 1999.

OCTA's 2006 Long-Range Transportation Plan, New Directions: Charting the Course for Orange County's Future Transportation System, includes a project to "add new lanes to the San Diego Freeway between I-605 and SR-55, generally within the existing right-of-way. The project will make best use of the available freeway property, update interchanges and widen all local overcrossings according to city and regional master plans…. The improvements will adhere to recommendations of the Interstate 405 Major Investment Study (as adopted by the Orange County Transportation Authority Board of Directors on October 14, 2005) and will be developed in cooperation with local jurisdictions and affected communities" (p. 54).

The OCTA Master Plan of Arterial Highways (MPAH), which was adopted May 23, 2005, identifies the ultimate cross section for arterial roadways in the county. There are 20 arterial crossings of I-405 within the limits of the proposed project. Partial funding for the I-405 improvements is included in the Renewed Measure M program. The Renewed Measure M program contains language that requires any arterial overcrossing replacements associated with widening I-405 to meet the MPAH standards.

The OCTA Commuter Bikeways Strategic Plan (Bike Plan), which was adopted August 10, 2001, shows one Class I bikeway facility crossing I-405 within the proposed project limits. That bikeway runs along the Santa Ana River bank and crosses beneath the bridge carrying the freeway over the river and Euclid Street. Several Class II bikeways cross the freeway on arterial overcrossings. OCTA is in the process of updating the Bike Plan.

An MIS for the I-405 corridor from SR-73 to I-605 was started in the fall of 2003. It considered three conceptual themes for improvements and five basic elements combined to create a variety of potential solutions to the mobility problems in the corridor. The three conceptual themes were:

1. Minimal right-of-way widening, which would generally stay within the existing right-of-way and add 1-2 travel lanes in each direction;
2. Horizontal widening, which would add several freeway lanes and transit facilities, expand the freeway outward, and displace adjacent land uses; and
3. Vertical expansion, which would construct elevated viaducts, provide similar facilities to horizontal widening, avoid major displacement of adjacent land uses, and potentially have visual and noise impacts from the elevated viaduct.

The five elements combined in various ways in the 13 alternatives considered in the MIS were:

- general purpose lanes;
- HOV lanes;
- auxiliary lanes;
- express lanes; and
- fixed guideway transit and bus-rapid-transit.

TSM components were included in each of the 13 alternatives.

A set of evaluation metrics was developed and applied to the alternatives. These measures permitted comparative evaluation of region-wide reduction in person hours of delay, percent reduction in corridor travel time, volume-to-capacity ratios in the corridor, lane continuity, percent reduction in arterial vehicle miles of travel, percent increase in transit trips, capital cost, cost effectiveness, and right-of-way acquisition needs.

A series of public meetings were held leading up to consideration of a Locally Preferred Strategy for the I-405 corridor by the OCTA Board of Directors. On October 14, 2005 The Board adopted a minimal right-of-way alternative which would add a single general purpose lane in each direction north of Brookhurst Street and auxiliary lanes at numerous locations. The alternative was preferred largely because of the limited amount of right-of-way acquisition required and very strong opposition to extensive right-of-way acquisition necessary for wider freeway alternatives. The Board made it clear that other alternatives within the same right-of-way footprint could be considered during project development.

On the portion of SR-22 that overlaps with I-405 within the proposed project limits (I-405 PM 20.8/24.0), two projects (EA 071621 and 072631) are currently in the PS&E phase. These two projects are collectively referred to as the SR-22 WCC project. The SR-22 WCC project will add a second HOV lane on I-405 in each direction from SR-22 east of the overlap to I-605 and provide HOV direct connectors between those new HOV lanes and HOV lanes on I-605 and on SR-22 east of the overlap. It is assumed, based on the approved SR-22 environmental document, that the SR-22 project will acquire 20 feet of additional ROW on the south side of the freeway between Bolsa Chica Road and Seal Beach Boulevard. Other projects in the corridor advancing in the project development process include:

- Elimination of the existing HOV buffer on the entire length of I-405 in Orange County and provision of continuous ingress and egress from the HOV lanes (PSR approved July 31, 2007, EA 0J440K);
- Addition of an auxiliary lane on southbound I-405 between the Talbert Avenue on-ramp and the Ellis Avenue/Euclid Street off-ramp (PSR approved December 7, 2005, EA 0C790K);
- Addition of an auxiliary lane on northbound I-405 between the Ellis Avenue/Euclid Street on-ramp and the Brookhurst Street off-ramp (PSR approved October 18, 2005, EA 0C780K);
- Addition of an auxiliary lane on northbound I-405 between the Brookhurst Street on-ramp and the Warner Avenue off-ramp (PSR approved May 2, 2005, EA 0C770K);
- Addition of auxiliary lanes on southbound I-405 between the Magnolia Street on-ramp and the Warner Avenue off-ramp and between the Warner Avenue on-ramp and

the Brookhurst Street off-ramp (PSR approved May 2, 2005, EA 0C760K);
- Ongoing construction of an auxiliary lane in each direction between the Beach Boulevard and Magnolia Street interchanges (EA 0A7624);
- Improvements to the ramp termini and ramp/arterial intersection approaches at both I-405 ramp intersections on Seal Beach Boulevard (PSR/PR approved April 18, 2003, EA 098203); and
- Removal of raised median islands and installation of concrete barrier at 19 locations on I-405, 14 of which are within the project limits (EA 0C540).

6 ALTERNATIVES

Build Alternative 1 was identified during the MIS and represents the LPS adopted by the OCTA Board of Directors. Some modifications, such as the locations of auxiliary lanes and the number of lanes between the Euclid Street and Brookhurst Street interchanges, have been made to the alternative since adoption of the LPS. Build Alternative 2 was developed during the PSR/PDS process and was presented to the PDT at early meetings.

This section presents a description of each of the alternatives. The deficiencies addressed by each alternative are presented along with other information, including capital costs and major risks.

6.1 Baseline Alternative: No Build

The Baseline Alternative represents the No Build Alternative. No additional lanes or interchange improvements would be provided by this alternative. Compared to the existing condition, the Baseline Alternative assumes the completion of two projects that have approved environmental documentation and are currently programmed. The SR-22 West County Connectors project from Valley View Street to I-605 will provide a second HOV lane in each direction in the segment of I-405 where SR-22 and I-405 overlap. It will also provide HOV direct connectors between I-405 and SR-22 east of Valley View Street and between I-405 and I-605. The Baseline Alternative also includes auxiliary lanes in both directions on I-405 between the Beach Boulevard and Magnolia Street/Warner Avenue interchanges.

Table 6 shows the forecast year 2030 daily traffic volumes for the Baseline Alternative. The committed addition of an HOV lane in each direction under the SR-22 West County Connectors project contributes to some of the traffic growth forecast for that segment.

Deficiencies Addressed

The Baseline Alternative would not address the I-405 deficiencies. Existing and forecast LOS F conditions in the corridor would continue. Bottlenecks due to poor lane continuity and high-volume on-ramp merges would not be improved. Queuing into the deceleration portions of some off-ramps would not be eliminated. Queuing from ramp meters onto the local arterial streets and across nearby arterial/arterial intersections would not be addressed. The excess of congestion-related mainline freeway accidents would not be dealt with.

Table 6
I-405 Baseline Alternative: Number of Travel Lanes and Year 2030 Daily Traffic Forecasts

I-405 Segment	PM	Number of Lanes: HOV + GP	Year 2030 Daily Traffic Volume	Percent Increase from Existing 2005 Daily Traffic Volume
Harbor Boulevard to Brookhurst Street	11.7/13.8	2+12*	410,000	9%
Brookhurst Street to SR-22 East	13.8/ 20.8	2+8	330,000	17%
SR-22 East to I-605	20.8/24.0	4+12**	525,000	35%***

PM = Postmile; HOV = High Occupancy Vehicle Lane; GP = General Purpose Lane
* 2+10 north of Euclid Street to Brookhurst Street
** 4+10 north of SR-22 West interchange to I-605
*** Baseline has an additional HOV lane compared to the existing condition
Source: Orange County Traffic Analysis Model (OCTAM)

6.2 Build Alternative 1: Add One General Purpose Lane

Build Alternative 1 would add a single general purpose freeway lane in each direction of I-405 from Euclid Street to the I-605 interchange. Mainline travel lanes in Build Alternative 1 would be 12 feet wide, left side shoulders 10-14 feet wide (as described below), and right side shoulders 10 feet wide, providing a full standard cross section.

In the northbound direction, additional auxiliary lanes would be provided between ramps at the following locations:

- from the southbound Harbor Boulevard/Hyland Street/westbound South Coast Drive on-ramp to the Euclid Avenue/Ellis Street off-ramp;
- from the northbound Brookhurst Street on-ramp to the Warner Avenue off-ramp;
- from the Beach Boulevard on-ramp to the Bolsa Avenue off-ramp;
- from the Goldenwest Street on-ramp to the Westminster Avenue off-ramp;
- from the Westminster Avenue on-ramp to the Valley View Street/Bolsa Chica Road/Garden Grove Boulevard/SR-22 eastbound off-ramp; and
- from the Seal Beach Boulevard on-ramp to the SR-22 Westbound/7th Street off-ramp.

In the southbound direction, additional auxiliary lanes would be provided between ramps at the following locations:

- from the Bolsa Chica Road/Valley View Street on-ramp to the Springdale Street off-ramp;
- from the Westminster Avenue on-ramp to the Goldenwest Street/Bolsa Avenue C-D road off-ramp;
- from the Goldenwest Street/Bolsa Avenue C-D road on-ramp to the Beach Boulevard/Center Avenue off-ramp;
- from the Magnolia Street on-ramp to the Brookhurst Street off-ramp; and
- from the southbound Euclid Street on-ramp to the Harbor Boulevard off-ramp, the southern portion of which currently exists.

Build Alternative 1 would include shoulders on the left and right sides in both directions. South of the Westminster Avenue interchange, the inside shoulder would be a 14-foot-wide continuous HOV enforcement shoulder, except for some narrowing to 10 feet near the Beach Boulevard and Goldenwest Street/Bolsa Avenue interchanges and at overcrossing column and overhead sign post locations. North of Westminster Avenue, the inside shoulder would be 10 feet wide. Build Alternative 1 would not include a buffer between the HOV and general purpose lanes. On July 31, 2007, the Department of Transportation approved a Project Study Report (EA 0J440K) to eliminate the existing HOV buffer on the entire length of I-405 in Orange County and provide continuous ingress and egress from the HOV lanes; the project has not been programmed or funded. Build Alternative 1 is designed based on the assumption that the ongoing SR-22 project improvements will include the acquisition of 20 feet of additional ROW on the south side of the freeway between Bolsa Chica Road and Seal Beach Boulevard, as cleared in the SR-22 environmental document.

Interchange improvements at each interchange within the project limits are proposed. Some interchanges have two options for improvements, which will be more fully investigated during the Project Approval/Environmental Document (PA/ED) phase of project development. Generally, each interchange would have the following improvements:

- left- and right-side shoulders on on-/off-ramps;
- increased on-ramp storage capacity for ramp meters;
- removal of HOV bypass lanes from on-ramps, subject to individual analysis of each on-ramp during the PA/ED phase and approval by the Department of Transportation and FHWA;
- increased off-ramp storage capacity at local street intersections;
- additional through and turn lanes at intersections of ramps and local streets; and
- reconfiguration to conventional right-turn lanes of continuous right-turn lanes at the intersections of ramps and local streets. This may be revisited during the PA/ED phase on a case-by-case basis and it will be consistent with current Caltrans design standards.

Additionally, Build Alternative 1 would include the following interchange improvements:

- a new on-ramp from eastbound Ellis Avenue to southbound I-405;
- reconfiguration of the Brookhurst Street interchange;
- braided ramps in both directions at Magnolia Street/Warner Avenue;
- braided ramps in both directions at Beach Boulevard; and
- reconfiguration of the existing northbound off-ramp to eastbound Westminster Avenue.

The proposed new on-ramp from eastbound Ellis Avenue to southbound I-405 presents design challenges. There are a number of constraints at this location. The Orange County Sanitation District's (OCSD) driveway is the fourth leg of the intersection of the I-405 southbound ramps with Ellis Avenue. The short distance between the intersection and the Santa Ana River embankment results in horizontal challenges. The difference in elevation between the intersection and the top of the riverbank results in vertical challenges. Refinements to the

proposed design of this new ramp and coordination with OCSD will continue to be pursued during the PA/ED phase of project development.

Due to the added travel lanes and shoulder widths on the freeway proposed under Build Alternative 1, 16 of the local street overcrossings of I-405 within the project limits would require replacement because the existing spans are inadequate to accommodate the additional width on the freeway. The Seal Beach Boulevard overcrossing is currently under design as part of the SR 22 West County Connectors project, and it is expected to be replaced with a span sufficient to accommodate Build Alternative 1.

Four other bridges are currently under design as part of the SR-22 WCC project. These are:

- a replacement of the SR-22 separation bridge carrying westbound SR-22 over I-405 near 7th Street;
- a replacement of the SR-22 separation bridge carrying eastbound SR-22 over I-405 near Valley View Street;
- a new bridge carrying the planned I-405/SR-22 HOV direct connectors over I-405 northbound; and
- a new bridge carrying the planned I-405/I-605 HOV direct connector over I-405 southbound.

Each of these four bridges is expected to be positioned and have a span designed as part of the SR-22 WCC project to accommodate Build Alternative 1.

The existing ramp to Bolsa Chica Road southbound is expected to be relocated from the eastbound SR-22 branch connector to the I-405 southbound mainline as part of the SR-22 West County Connectors project.

The Euclid Street/Ellis Avenue undercrossing bridge and the two railroad overheads within the project limits would require widening. The pedestrian bridge over I-405 near Heil Avenue would require replacement.

A set of conceptual layout plans for Build Alternative 1 is included as a separately bound volume of this report. Where SR-22 and I-405 overlap, the proposed project would result in a freeway with nine lanes in each direction. In order for traffic in the left lanes, including the HOV lanes, to properly exit the freeway signage would be provided far enough upstream to accommodate the required number of lane changes to exit the freeway. A detailed signing plan will be developed during the PA/ED phase of the project.

Build Alternative 1 would include a set of Transportation System Management (TSM) and Transportation Demand Management (TDM) components, such as park-and-ride facilities, and Intelligent Transportation System (ITS) elements. ITS elements that will be considered include a fiber optic communication system, dynamic message signs (e.g., variable advisory speed signs, lane management signing, and changeable message signs), detection systems (e.g., emergency vehicle and transit signal priority systems, and commercial vehicle operations systems), ramp meter systems (including corridor-wide adaptive ramp meters and ramp metering of HOV by-pass lanes for transit and HOV access), and camera systems. Additional ITS, TSM, and TDM elements may be identified during the PA/ED phase of the project. Implementation of ITS

elements gathering additional real-time traffic data may require upgrades to the District 12 Transportation Management Center, which are not currently planned or programmed and which would be beyond the current funding scope of the I-405 widening project.

The locations of park-and-ride facilities will be determined during the PA/ED phase of the project, when consideration will be given to the use of excess lands resulting from proposed interchange reconfigurations as well as other available unused right-of-way. Other locations outside the right-of-way may also be considered.

Maintenance vehicle pullouts (MVP) are included in Build Alternative 1. As many as 46 potential locations have been identified where MVPs could be accommodated. The precise locations of MVPs will be determined during subsequent phases of project development.

Build Alternative 1 will include the provision of appropriate pedestrian facilities on overcrossings and along arterials within interchanges. Pedestrian facilities provided will comply with current Americans with Disabilities Act (ADA) requirements.

Table 7 shows the forecast year 2030 daily traffic volumes for Build Alternative 1.

Table 7
I-405 Build Alternative 1: Number of Travel Lanes and Year 2030 Daily Traffic Forecasts

I-405 Segment	PM	Number of Lanes: HOV + GP	Year 2030 Daily Traffic Volume
Harbor Boulevard to Brookhurst Street	11.7/13.8	2+12	425,000
Brookhurst Street to SR-22 East	13.8/ 20.8	2+10	350,000
SR-22 East to I-605	20.8/24.0	4+14*	545,000

PM = Postmile; HOV = High Occupancy Vehicle Lane; GP = General Purpose Lane

*4+12 north of SR-22 West interchange to I-605

Source: Orange County Traffic Analysis Model (OCTAM)

Deficiencies Addressed

Build Alternative 1 would improve LOS compared to the Baseline (No Build) Alternative as shown in Figures 3 through 6. In year 2030, fewer segments of the northbound freeway within the project limits are expected to operate at LOS F in the morning peak hour. In the evening peak hour, nearly all of the freeway would operate at LOS F. In the southbound direction, fewer segments would operate at LOS F in the peak hours, and the segments operating at LOS F would generally be more southerly than in the Baseline condition. The addition of a lane farther north is expected to improve LOS in the more northerly segments and increase the volume of traffic flowing into the more southerly segments.

As compared to the Baseline year 2030 condition, Build Alternative 1 reduces peak hour travel time on I-405 between SR-73 and I-605 from a range of 40 to 64 minutes to a range of 20 to 43 minutes, as shown in Table 8. Peak hour travel speed is increased from a range of 13 to 19 mph with the Baseline Alternative to 20 to 39 mph with Build Alternative 1. In percentage

terms, travel time is reduced by 33 to 50 percent, and travel speed is increase by 54 to 105 percent.

Table 8
I-405 Build Alternative 1 Year 2030
Mainline Peak Hour Travel Time and Speed: SR-73 to I-605

	Travel Time*			Travel Speed**		
	2030 Baseline	2030 Alternative 1	Percent Improvement	2030 Baseline	2030 Alternative 1	Percent Improvement
Northbound AM Peak Hour	53	30	43%	16	28	75%
Northbound PM Peak Hour	64	43	33%	13	20	54%
Southbound AM Peak Hour	61	39	36%	13	20	54%
Southbound PM Peak Hour	40	20	50%	19	39	105%

* Travel time in minutes

** Travel speed in miles-per-hour

Source: FREQ model prepared by OCTA

Build Alternative 1 would reduce the impact of the bottleneck created northbound by the successive lane drops at Euclid Street and Brookhurst Street. One of these lane drops would be eliminated by the alternative. The impact of bottlenecks created by on-ramps merging with the freeway mainline would be reduced by the provision of auxiliary lanes linking many on-ramps to a downstream off-ramp. These auxiliary lanes effectively increase the distance over which merging and diverging maneuvers take place, thereby reducing the turbulence in the mainline traffic stream created by ramps.

Build Alternative 1 is not expected to have queues from off-ramp termini backing into the deceleration portion of off-ramps. At the I-405 southbound off-ramp to Center Avenue, which serves the Beach Boulevard interchange, the alternative includes 700 feet of ramp storage in excess of the need for queues at the ramp terminus. This excess storage is available to accommodate the effects of queues from the Center Avenue intersection with Beach Boulevard that are expected to backup across the ramp intersection.

Build Alternative 1 would add substantial additional vehicle storage at ramp meters through the proposed reconfigurations of corridor interchanges. The additional storage would reduce the likelihood and/or frequency of ramp meter queues backing onto the local arterial street. Table 9 shows the Baseline (existing) and proposed storage at ramp meters for every on-ramp within the proposed project limits. On-ramps would generally have an increased amount of storage, except that one location would have the same amount and four locations would have less storage.

At off-ramp locations forecast to have in excess of 1,000 peak hour vehicles, dual-lane exit ramps (generally an exclusive exit lane and a choice exit/through lane) are proposed. Two exceptions occur at the southbound exit to Magnolia Street and the northbound exit to Bolsa Avenue. In both cases, the single-lane exit is fed by an auxiliary lane, which starts at the upstream on-ramp. The peak hour exit volume at the Magnolia Street ramp is 1,210 in year 2030.

The peak hour exit volume at the Bolsa Avenue ramp is 1,220 in year 2030. Provision of a second exit lane would result in an undesirable merge condition on the loop portion of the ramp. These configurations will be re-evaluated during the PA/ED phase of the project.

Table 9
Baseline and Proposed Lane Feet of On-Ramp Storage at Ramp Meters

Interchange and On-Ramp	Baseline	Build Alternatives
Euclid St/Ellis Ave		
To Northbound I-405 from Euclid	960	1920
To Southbound I-405 from Ellis*	1170	2825
Brookhurst Street/Talbert Avenue		
To Northbound I-405 from southbound Brookhurst	425	1450
To Northbound I-405 from northbound Brookhurst	710	2675
To Southbound I-405 from southbound Brookhurst	730	2675
To Southbound I-405 from eastbound Talbert	920	850
Magnolia Street/Warner Avenue		
To Northbound I-405 from southbound Magnolia	550	550
To Northbound I-405 from northbound Magnolia	700	2300
To Northbound I-405 from westbound Warner	2020	2000
To Southbound I-405 from southbound Magnolia	740	4500
To Southbound I-405 from eastbound Warner	2060	2000
Beach Boulevard/Edinger Avenue		
To Northbound I-405 from southbound Beach	575	890
To Northbound I-405 from northbound Beach	820	3440
To Southbound I-405 from Center Avenue	420	1820
To Southbound I-405 from Edinger	790	1160
Goldenwest Street/Bolsa Avenue		
To Northbound I-405 from northbound Goldenwest	730	1530
To Southbound I-405 from Westminster Mall Road	580	430
To Southbound I-405 from eastbound Bolsa	980	1770
Westminster Avenue/Springdale Street		
To Northbound I-405 from Westminster	950	1880
To Southbound I-405 from Westminster	740	2100
Bolsa Chica Road/Valley View Street		
To Southbound I-405 from southbound Valley View	1080	1600
Seal Beach Boulevard		
To Northbound I-405 from Seal Beach Boulevard	1160	1250
To Southbound I-405 from Seal Beach Boulevard	1250	2500

* Build alternatives include an additional new on-ramp

The addition of auxiliary and general purpose lanes would help reduce congestion and congestion-related accidents. A reduction of rear-end collisions is anticipated as a result of reduced congestion in the corridor. Improvements to superelevation transition areas, drainage, and shoulders are included in the project, and they are expected to reduce problems related to flooding. The improvements are anticipated to address current safety deficiencies related to congestion, superelevation transitions, drainage, and shoulders.

Capital Cost

The capital cost of Build Alternative 1 ranges from $1.11 billion to $1.36 billion. This range represents the amount of the estimate included in Attachment 1, plus/minus 10 percent.

Risk

A potential risk associated with this alternative is public opposition to substantial ROW acquisition. Build Alternative 1 assumes that the approved Project Study Report (EA 0J440K) to eliminate the existing HOV buffer on the entire length of I-405 in Orange County is programmed and funded and the buffer removed. As noted above, south of the Westminster Avenue interchange, the proposed inside shoulder of Build Alternative 1 would generally be a 14-foot-wide continuous HOV enforcement shoulder in both directions, except for some localized narrowing. In the event that a buffer is included in Alternative 1 in subsequent phases of project development, the 14 foot inside shoulder could be restriped as a 10 foot inside shoulder and a 4 foot buffer. However, some locations with only a 10 foot inside shoulder may require substantial additional right-of-way. The MIS LPS for this corridor is intended to limit ROW acquisition for improvements to spot locations, primarily in the areas of the interchanges. The MIS LPS intended to avoid acquisition of swaths of additional land with buildings along one or both sides of the freeway mainline for extended distances. The LPS was selected by OCTA during the MIS phase largely because it avoids such swaths of ROW acquisition. The goals of the MIS LPS will be considered as Build Alternative 1 is further developed and studied during the PA/ED phase. This may involve the consideration of design exceptions for some cross sectional features at some spot locations and/or elimination of proposed auxiliary lanes at some locations.

6.3 Build Alternative 2: Add Two General Purpose Lanes

Build Alternative 2 would add one general purpose lane in each direction as in Build Alternative 1, plus a second lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street. Other features of Build Alternative 2 are similar to Build Alternative 1, except as noted below. Build Alternative 2 would have the same auxiliary lanes as Build Alternative 1 plus an auxiliary lane from the Euclid Street/Ellis Avenue on-ramp to the Brookhurst Street off-ramp in the northbound direction. Build Alternative 2 would not have a northbound auxiliary lane from the Seal Beach Boulevard on-ramp to the SR-22 Westbound/7th Street off-ramp. In the southbound direction, Build Alternative 2 would have the same auxiliary lanes as Build Alternative 1 plus an auxiliary lane from the Talbert Avenue on-ramp to the Euclid Street/Ellis Avenue off-ramp.

Build Alternative 2 will include the provision of appropriate pedestrian facilities on overcrossings and along arterials within interchanges. Pedestrian facilities provided will comply with current Americans with Disabilities Act (ADA) requirements.

Table 10 shows the forecast year 2030 daily traffic volumes for Build Alternative 2.

Table 10
I-405 Build Alternative 2: Number of Travel Lanes and Year 2030 Daily Traffic Forecasts

I-405 Segment	PM	Number of Lanes: HOV + GP	Year 2030 Daily Traffic Volume
Harbor Boulevard to Brookhurst Street	11.7/13.8	2+12	435,000
Brookhurst Street to SR-22 East	13.8/ 20.8	2+12	365,000
SR-22 East to I-605	20.8/24.0	4+16*	560,000

PM = Postmile; HOV = High Occupancy Vehicle Lane; GP = General Purpose Lane

* 4+14 northbound from SR-22 West interchange to I-605 and southbound from I-605 to Seal Beach Boulevard

Source: Orange County Traffic Analysis Model (OCTAM)

Deficiencies Addressed

Build Alternative 2 would improve LOS compared to the Baseline and Build Alternative 1 as shown in Figures 3 through 6. The figures show that the extent of LOS F conditions is reduced in each direction during the morning and evening peak hours in year 2030. In year 2030 during the morning peak hour, only the portion of northbound I-405 where SR-22 overlaps is expected to operate at LOS F. In the northbound direction during the evening peak hour, the portion of I-405 north of the Bolsa Avenue interchange is expected to operate at LOS F. In the southbound direction during the morning peak hour LOS F conditions are expected from Magnolia Street south to SR-73. During the evening peak hour in the southbound direction only the SR-22 overlap area is expected to operate at LOS F, which contrasts with the LOS D conditions expected for this location under Alternative 1 which has one less lane. The additional capacity provided by Alternative 2 in the corridor as far south as Euclid Street attracts more traffic to the SR-22 overlap area, which results in an LOS F condition in that area.

Build Alternative 2 would reduce the impact of the bottleneck created northbound by the successive lane drops at Euclid Street and Brookhurst Street. Both of these lane drops would be eliminated by the alternative. As compared to the Baseline year 2030 condition, Build Alternative 2 reduces peak hour travel time on I-405 between SR-73 and I-605 from a range of 40 to 64 minutes to a range of 17 to 39 minutes, as shown in Table 11. Peak hour travel speed is increased from a range of 13 to 19 mph under the Baseline Alternative to 22 to 46 mph with Build Alternative 2. In percentage terms, travel time is reduced by 39 to 58 percent, and travel speed is increased by 69 to 142 percent.

Table 12 provides a direct comparison of the travel time and speed improvements of Build Alternative 2 compared to those of Build Alternative 1. Build Alternative 2 would reduce travel time on I-405 from SR-73 to I-605 during peak hours from 9 to 18 percent and increase speed from 10 to 25 percent compared to Build Alternative 1.

Build Alternative 2 is similar to Build Alternative 1 in addressing deficiencies related to bottlenecks at on-ramp merge locations, queuing from off-ramp termini, vehicle storage and queuing at ramp meters, and safety. Build Alternative 2 is also similar to Build Alternative 1 with respect to interchange LOS at ramp/arterial intersections and arterial/arterial intersections in close proximity to interchanges.

Table 11
I-405 Build Alternative 2 Year 2030
Mainline Peak Hour Travel Time and Speed: SR-73 to I-605

	Travel Time*			Travel Speed**		
	2030 Baseline	2030 Alternative 2	Percent Improvement	2030 Baseline	2030 Alternative 2	Percent Improvement
Northbound AM Peak Hour	53	27	49%	16	31	94%
Northbound PM Peak Hour	64	39	39%	13	22	69%
Southbound AM Peak Hour	61	32	48%	13	25	92%
Southbound PM Peak Hour	40	17	58%	19	46	142%

* Travel time in minutes
** Travel speed in miles-per-hour
Source: FREQ model prepared by OCTA

Table 12
I-405 Build Alternatives 1 and 2 Year 2030
Comparison of Forecast Mainline Peak Hour Travel Time and Speed: SR-73 to I-605

	Travel Time*			Travel Speed**		
	2030 Alternative 1	2030 Alternative 2	Percent Improvement	2030 Alternative 1	2030 Alternative 2	Percent Improvement
Northbound AM Peak Hour	30	27	10%	28	31	11%
Northbound PM Peak Hour	43	39	9%	20	22	10%
Southbound AM Peak Hour	39	32	18%	20	25	25%
Southbound PM Peak Hour	20	17	15%	39	46	18%

* Travel time in minutes
** Travel speed in miles-per-hour
Source: FREQ model prepared by OCTA

Capital Cost

The capital cost of this alternative ranges from $1.51 billion to $1.85 billion. This range represents the amount of the estimate included in Attachment 1, plus/minus 10 percent.

Risk

A potential risk associated with this alternative is public opposition to substantial ROW acquisition. The MIS LPS for this corridor is intended to limit ROW acquisition for improvements to spot locations, primarily in the areas of the interchanges. The MIS LPS intended to avoid acquisition of swaths of additional land with buildings along one or both sides of the freeway mainline for extended distances. The LPS was selected by OCTA during the MIS phase largely because it avoids such swaths of ROW acquisition. The goals of the MIS LPS will be considered as Build Alternative 2 is further developed and studied during the PA/ED phase. This may involve the consideration of design exceptions for some cross sectional features at some spot locations and/or reconsideration of proposed auxiliary lanes at some locations. Furthermore, Build Alternative 2 assumes that the approved Project Study Report (EA 0J440K) to eliminate the existing HOV buffer on the entire length of I-405 in Orange County is programmed and funded and the buffer removed. In the event that a buffer is included in

Alternative 2 in subsequent phases of project development, the above ROW acquisition risk would be increased.

A second potential risk is that the touchdown points of the I-405/SR-22 HOV direct connector and the eastbound SR-22 branch connector over I-405 to be constructed as part of the SR-22 WCC project may not be positioned optimally for this alternative. A similar potential risk is associated with the Slater Avenue overcrossing replacement proposed in the approved PSR for EA 0C760K. Proper coordination with both of the above projects is recommended to ensure the improvements are implemented with minimal throwaway costs.

7 COMMUNITY INVOLVEMENT

An MIS was undertaken by OCTA in 2004 to examine the transportation needs of western Orange County. This 18-month effort was part of OCTA's strategic effort to keep Orange County moving over the next 20 years. Both the MIS and PSR/PDS development occurred with the collaboration of a PDT, which includes technical representatives from OCTA, the Department of Transportation, and the cities along the corridor.

An initial set of 13 alternatives developed for the MIS were narrowed down to 5 final alternatives by a process involving technical analysis and public input through various workshops and outreach efforts. The 13 alternatives included minimal widening (generally limited to the existing ROW), horizontal widening (requiring substantial amounts of new ROW), and vertical expansion (through the use of elevated viaduct). The alternatives included rail and bus-rapid-transit components. The alternatives were the result of an extensive collaboration among the OCTA study team, traffic engineers, local public officials, business and community leaders, commuters, and local residents, all of whom gave their time, ideas, and comments to the study effort. The alternatives for improvement represent a community consensus about feasible improvements to I-405 in the years ahead.

After reviewing the alternatives, the project's Policy Working Group (PWG), which consists of elected officials from the cities along the corridor, recommended to the OCTA Board of Directors that only the minimal widening alternative (Alternative 4) be moved forward into the project initiation document (PID) phase. The OCTA Board ratified this approach by choosing Alternative 4 as the LPS in October 2005. Alternative 4 of the MIS would add capacity in each direction between Brookhurst Street and I-605. It would also add auxiliary lanes in many locations where sufficient ROW is available. The LPS may also include other operational improvements and new park-and-ride facilities. Build Alternative 1 of this PSR/PDS is based on the LPS (MIS Alternative 4).

The PWG meetings resumed in April 2007 to provide members of the corridor cities and elected officials with a status update of the conceptual engineering effort. There have been three additional PWG meetings, each of which provided a status update of the PSR/PDS development and sought input on the project from PWG members. The meetings occurred in September 2007, and January and May (planned) 2008. During the PA/ED phase, there would be additional public

outreach pursuant to the California Environmental Quality Act/National Environmental Policy Act (CEQA/NEPA).

8 ENVIRONMENTAL DETERMINATION/DOCUMENT

A Preliminary Environmental Assessment Report (PEAR) was prepared as part of this PSR/PDS and is Attachment 10 of this report. It also includes a summary of the environmental process expected for the proposed project. The PEAR identifies potential impacts, assumed permits, and potential mitigations. Additional information on environmental topics is contained in the PEAR.

The preliminary environmental investigation of the proposed project is focused on potential impacts from the two build alternatives along the I-405 corridor. Impacts may occur to the following resources: community, farmlands, visual, water quality, floodplains, noise, air quality, cultural resources, Sections 4(f) and 6(f), hazardous waste/materials, utilities and services, and transportation/traffic. The project may also result in temporary, secondary, and/or cumulative impacts.

The proposed improvements could result in significant impacts. In consideration of the scope of the project, and specifically the number of properties that could potentially be affected, the magnitude of construction activities and the complexity of the project, involving a broad range of impacts to various environmental resources, an Environmental Impact Report (EIR) pursuant to CEQA and an Environmental Impact Statement (EIS) pursuant to NEPA will be required. It is estimated that the EIR/EIS approval of the I-405 Corridor Improvement Project will require 36 months for completion. Caltrans District 12 will be the Lead Agency for CEQA and NEPA; NEPA authority is assigned in accordance with Section 6005 of SAFETEA-LU (U.S.C. 327[a][2][A]).

Preparation of the following technical studies is recommended to assess the impacts of the project and to develop feasible avoidance, minimization, or mitigation measures. The anticipated time durations for preparation of each technical study is shown in parentheses.

- Community Impact Assessment (6 months)
- Relocation Impact Report (6 months)
- Visual Impact Assessment (9 months)
- Water Quality Assessment Report (3 months)
- Summary Floodplain Encroachment Report or Floodplain Evaluation Report (3 months)
- Traffic Noise Study Report/Noise Abatement Decision Report (NADR) (9 months)
- Air Quality Report (4 months)
- Cultural Resources Studies (Historic Property Survey Report; Historic Resource Evaluation Report; and Archaeological Survey Report) (5 months)
- Sections 4(f) and 6(f) Evaluation (2 months)
- Initial Site Assessment – Update (9 month)
- Natural Environment Study (9 months)
- Traffic Impacts/Circulation Study (12 months)

The following special considerations could affect the environmental approval schedule and/or the issues to be analyzed in detail:

- The process for the acquisition of ROW and business and residential relocations could affect the project schedule. The acquisition of several parcels, especially properties that may require condemnation through the eminent domain processes, may result in delays.

- Potential public opposition to the project could affect the project schedule, especially during the environmental document review phase. Community controversy could result from proposed ROW acquisition and relocations, as well as temporary construction impacts, such as lane and ramp closures in an already congested corridor and reconstruction of soundwalls to accommodate the I-405 widening. Higher-level public outreach efforts, such as additional open house meetings/workshops, notices, and extended review/comment periods, will be implemented to address any public controversy.

It is estimated that the EIR/EIS approval for the I-405 Corridor Improvement Project will require 36 months to complete the identified tasks in this PEAR, and additional tasks which will likely emerge during the PA/ED process.

The following is a brief summary of key environmental issues for each practicable build alternative.

Build Alternative 1

Addition of one general purpose lane in each direction of I-405 from Euclid Street to I-605 and auxiliary lanes between key interchanges would add capacity to the freeway and improve operations. This alternative would result in higher freeway average daily traffic (ADT) through the corridor, than under the No Build Alternative, thereby necessitating studies of air and noise emissions. Additional impacts would include temporary and permanent property easements, and in some cases ROW relocations; replacement of 17 overcrossings and related visual and traffic impacts; additional impervious surfaces increasing stormwater runoff; and bridge widenings over 5 surface water crossings involving temporary and permanent placement of fill in waters of the U.S.

Build Alternative 2

Addition of one general purpose lane in each direction of I-405 from Euclid Street to I-605 and addition of a second general purpose lane northbound from Brookhurst Street to the SR-22/7th Street interchange and southbound from the Seal Beach Boulevard on-ramp to Brookhurst Street, as well as auxiliary lanes between key interchanges, would add more freeway capacity than Build Alternative 1 and improve freeway operations. Alternative 2 would require replacement of the same 17 overcrossings as Alternative 1, with related visual and traffic impacts. This alternative would result in higher freeway ADT through the corridor than the No Build Alternative and Build Alternative 1, thereby necessitating studies of air and noise emissions. Build Alternative 2 would have substantially greater impacts than Build Alternative 1 in the areas of: ROW impacts and relocations; impervious surfaces increasing stormwater runoff; and bridge widenings over 5 surface water crossings involving temporary and permanent placement

of fill in waters of the U.S. Build Alternative 2 would also require additional and higher retaining walls than Build Alternative 1, resulting in potential visual impacts; it would reduce the vehicle miles traveled on local streets by redistributing traffic to the widened freeway, however this redistribution would result in additional traffic on those arterials with interchanges to the freeway.; it would require more demolition and replacement of existing soundwalls; and there would be less available ROW, limiting opportunities for freeway landscaping.

9 OTHER TOPICS

9.1 Potential Water Quality Impacts

Within the project limits, the existing paved surface area is measured to be 293 acres. The proposed project would add an additional 111 acres of paved surface area. Therefore, the velocity and volume of downstream flow is expected to increase. The total areas for each of the watersheds that the proposed project traverses are as follows:

- Santa Ana River Watershed has an area of 2,800 square miles;
- Talbert Watershed has an area of 21.4 square miles; and
- Westminster Watershed has an area of 74.1 square miles.

The total area of these three watersheds is 2,896 square miles. The proposed project would add 111 acres of paved surface. This can be expected to translate into minor localized increases in urban runoff within the storm drain system. This project will not discharge to unlined channels. With the implementation of Treatment BMPs such as Biofiltration Strips/Swales, Detention Devices, Infiltration Devices, Media Filters, or any combination thereof, adverse effects to water resources and hydrology are not anticipated. Where appropriate, energy dissipation devices will be utilized. All transitions between culvert outlets, headwalls, wingwalls, and channels will be smoothed to reduce turbulence and scour. These topics are more fully described in the Storm Water Data Report (see Attachment 7) prepared for the proposed project.

The PEAR for the proposed project (see Attachment 10) recommends preparation of a Storm Water Pollution Prevention Plan. The PEAR also notes that the following permits will be required:

- Clean Water Act Section 401 Water Quality Certification;
- Clean Water Act Section 404 Permit;
- California Department of Fish and Game Section 1602 Streambed Alteration Agreement;
- National Pollution Discharge Elimination System Permit; and
- Santa Ana Regional Water Quality Control Board Dewatering Permit

9.2 Railroads

There are two railroad overheads within the proposed project limits. The freeway passes over the Union Pacific Railroad (UPRR) on the Bolsa Overhead (Bridge No. 55-269 at PM 17.21) and the

US Navy Railroad on the Navy Overhead (Bridge No. 55-272 at PM 18.36). Both overheads would be widened to accommodate the proposed freeway widening. Required railroad clearances would be maintained and a crash cushion installed at the UPRR overhead.

Written contact with the two railroads regarding the proposed project was initiated and a response was received from one. The correspondence is presented in Attachment 3.

9.3 Utilities

There are numerous utilities along the corridor of the proposed project, including some high risk utilities. Utilities are identified in the Utility Information Sheet presented in Attachment 2.

There are high voltage power lines identified in the Utility Information Sheet. More detailed design work in the PA/ED and PS&E phases of the project will determine where these lines are in relation to traffic signal poles and Department of Transportation requirements for separation between them. Additional electrical service may be required for the proposed project. These will be identified in subsequent phases of the project as will the need for additional transformers.

There are two gas pipelines in a 20 foot easement over land owned by the US Navy. The easement parallels and abuts the freeway right-of-way between Seal Beach Boulevard and Bolsa Chica Road. OCTA is planning to acquire the easement from the US Navy as part of the SR-22 West County Connectors project, which is currently in the PS&E phase. Under that project the two gas pipelines would remain in their current locations. The pipelines would be relocated as part of the I-405 widening.

9.4 Noise Walls

Soundwalls exist intermittently within the proposed project limits. A general survey of these barriers indicates that they are mostly concentrated in areas adjacent to single-family residences; however, several potentially sensitive land uses are not protected by soundwalls. The PEAR recommends preparation of a Traffic Noise Study Report/Noise Abatement Decision Report (NADR) to evaluate the attenuation provided by existing barriers relative to the proposed project and increases in traffic noise, as well as predicted noise levels in areas where there currently is no barrier.

Noise walls have been included in the cost estimate presented in Attachment 1. A breakdown of the costs of proposed sound walls and their locations is provided in the PSR/PDS Attachment 6 Division of Engineering Services PSR(PDS) Scoping Checklist. Generally the areas considered for sound walls are those with residential property abutting or nearby the freeway.

In many locations sound and/or retaining walls are proposed at the edge of the right-of-way to minimize acquisitions. At locations with cross sections narrower than the right-of-way, offsets will be assessed during the PA/ED phase of project development.

9.5 Aesthetics and Landscaping

The cost estimate for walls, including noise walls and all other walls, has been increased by 2 percent for aesthetic improvements. An Aesthetic Theme and Guidelines Committee will be

formed during the PS&E phase of project development to guide aesthetic components of the project.

A Replacement Highway Planting Project, distinct from the roadway construction project, is planned for provision of landscaping along the corridor. Because roadway construction is envisioned from edge of right-of-way to edge of right-of-way along much of the freeway mainline, landscaping will be most prevalent at interchanges. The project cost estimate (Attachment 1) includes costs for landscaping.

9.6 Right-of-Way

Right-of-Way Data Sheets for the proposed project are presented in Attachment 2. The data sheets include Utility Information Sheets and Railroad Information Sheets. The right-of-way required for this project lies within the cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley and Costa Mesa. Final determinations regarding acquisitions for the project will be determined during subsequent phases of project development.

A clearance envelop extending at least 15 feet outboard of the two railroad overheads to be widened by the proposed project would also be acquired by easement or license.

9.7 Stage Construction

Due to the magnitude of the proposed project, the replacement of 16 overcrossings, and the flow of funding, construction of the proposed project would be completed in stages. The stages will be developed in subsequent phases on project development. The cost estimates presented in Attachment 1 include stage construction estimates as well as estimates for temporary traffic items to be employed during construction. The stage construction estimate implicitly includes costs for items such as temporary pavement and K-rail and explicitly includes temporary drainage and temporary fiber optic communication. Traffic items include temporary lane and gore delineation, temporary signage and signals, and the traffic management plan.

9.8 Initial Site Assessment

An Initial Site Assessment (ISA) (separately bound) was conducted for the proposed project. The ISA found no Recognized Environmental Conditions (REC) at the site or immediately adjacent except as follows:

- Accidents, incidents and observations that indicate oil/fuel releases on the freeway ROW. These include 2 incidents reported on the I-405 freeway, and oil spill observed during our site visit. Further investigations of these cases are not needed. However, construction planning should include that small quantities of oil/fuel contaminated soil may be encountered when making excavations and that these will be managed as they are found.
- Aerially deposited lead (ADL) and agricultural chemicals in the shallow soil of unpaved sections of the freeway.
- Distressed vegetation at two locations along the northbound side of the freeway and several locations along the southbound side of the freeway. Further evaluation of

these conditions should be done by a trained landscape architect, horticulturist, or botanist.

- Two Department of Defense (DOD) facilities (Seal Beach Naval Weapons Station and Los Alamitos Armed Forces Reserve Center) and one National Priority List (NPL) site (Superfund Site) - Westminster Tract #2633.
- Thirty seven (37) Leaking Underground Storage Tanks (LUST) cases and four (4) drycleaners that adjoin the freeway.

It is anticipated that this project will require dewatering The ISA recommends that site-specific groundwater contamination data will be needed to evaluate proper methods to manage and dispose of groundwater that might be removed during construction.

9.9 Program Management Plan and Financial Plan

Signed into law on August 10, 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users requires the preparation of a Project Management Plan (PMP) and an annual Financial Plan (FP) for major projects (23 USC 106(h)). A major project is one for which there is federal funding and an estimated total cost of $500 million or more.

The PMP is a guide to implement the project and documents processing including communications, management, execution, and project control. A draft PMP must be submitted to FHWA prior to approval of the NEPA decision document and the PMP must be submitted within 90 days of the date of the signed NEPA decision document.

The FP describes implementation of the project and its costs over time and the financial resources utilized to meet those costs. Annual updates to the FP track the financial progress of the project and identify deviations from the Initial FP and explain any actions taken to limit or mitigate the deviations. The Initial FP should be prepared as early in the process as practical and must be submitted and approved by FHWA before authorization of Federal-aid funding for construction.

The Draft PMP and Initial FP will be prepared during the PA/ED phase of project development and submitted to FHWA for review.

9.10 Engineering Technical Studies

The PEAR recommends preparation of the following engineering technical studies during the PA/ED phase or other subsequent phase of project development, as appropriate. The following list is not meant to be exhaustive of the engineering technical studies required during subsequent phases of project development.

- Value Analysis
- Updated Right-of-Way Data Sheets
- Updated the Storm Water Data Report
- Location Hydraulic Study
- Geotechnical Study

- Traffic Management Plan and Ramp Closure Study, if warranted

9.11 Air Quality

The PEAR recommends the preparation of an air quality study. The proposed project would result in higher freeway ADT through the corridor, than under the No Build Alternative, thereby necessitating study of air emissions. Potential improvements to the I-405 corridor would be designed to reduce congestion and improve traffic flow in the study area; thus, the improvements should yield air quality benefits. Air quality impacts associated with construction activities would be temporary and would be minimized by compliance with Southern California Air Quality Management District requirements.

Structures, including bridges and buildings, would be demolished under both build alternatives; therefore, there is the risk of structural asbestos being released into the air. Structures would be evaluated for Asbestos Containing Material (ACM) and, if present, this material would be contained during demolition to avoid release of airborne asbestos. The PEAR recommends coordination with the Transportation Conformity Working Group (TCWG) to assess conformity for particulate matter and determine if the proposed project is a "Project of Air Quality Concern." The air quality conformity determination will be made by FHWA.

10 FUNDING

10.1 Capital Cost Estimate for the Alternative Identified for Programming in the 2010 STIP

The proposed project is currently funded with an estimated $500 million as part of the Renewed Measure M (local half-cent sales tax) freeway program. The Renewed Measure M program was reauthorized by the Orange County voters in November 2006, and it is set to begin in 2011 and sunsets in 2041. The original Measure M was passed in 1990 by Orange County voters to fund a 20-year program of transportation improvements. Measure M allocates all sales tax revenues to specific Orange County transportation improvement projects in three major areas—freeways, streets, roads and transit. Once the PSR/PDS document is approved, OCTA will use the document to seek STIP funding for capital right-of-way costs for Fiscal Year 2012/2013 and construction funding for Fiscal Year 2014/2015.

10.2 Project Support Estimate for the Alternative Identified for Programming in the 2010 STIP

As part of an effort to reduce construction costs on the Renewed Measure M freeway projects, OCTA will be advancing the proposed project's Project Approval/Environmental Document (PA/ED) phase and fund this effort through the SAFETEA-LU demonstration funds and local Renewed Measure M matching funds. OCTA will advance the funding for support costs in preparation of the Project Report and Environmental Document. The Department of Transportation will provide the Independent Quality Assurance.

Once the PSR/PDS document is approved, OCTA will use the document to seek STIP funding for Fiscal Year 2009/2010 for the PA/ED phase. Table 13 outlines the capital outlay estimates and the available sources of funding for the proposed project. The PSR/PDS will also be used to seek other available funding sources. The federal funds shown in the table are programmed for the PA/ED phase.

Table 13
Capital Outlay Estimate for the 2010 STIP

	Alternative 1	Alternative 2
Estimated Costs		
Construction	$947,760,000	$1,071,690,000
Right-of-Way	$42,518,000	$272,000,000
Support	$247,570,000	$335,930,000
Range for Total Cost	$1.11 – $1.36 billion	$1.51 - $1.85 billion
Funding		
Federal*	$2,990,000	$2,990,000
Local Measure M Extension	$500,000,000	$500,000,000
Other Sources	To be Determined	To be Determined

*SAFETEA-LU Demonstration Funds programmed for the PA/ED phase.

11 SCHEDULE

HQ Milestones	Delivery Date
Begin Environmental	October 1, 2008
Notice of Preparation/ Notice of Intent (NOP/NOI)	November 1, 2008
Circulate Draft ED	April 1, 2010
PA & ED	October 1, 2011
Project Plans, Specifications, and Estimate (PS&E)	November 1, 2014
ROW Certification	March 1, 2015
Ready to List	May 1, 2015
Approve Contract	October 1, 2015
Contract Acceptance	October 1, 2019
End Project (Project Closeout)	October 1, 2022

12 FHWA COORDINATION

FHWA staff have been apprised of the proposed project. A meeting was held September 13, 2007, at District 7 of the Department of Transportation to review the proposed alternatives. FHWA Program Coordinator Scott McHenry attended the meeting. In addition to District 12 Department of Transportation staff, Jim DeLuca (HQ Project Development Coordinator) and Bob Chapman (former HQ Design Reviewer of District 12) attended the meeting. Tay Dam from the Federal Highway Administration attended a meeting on the Project Initiation Document at Department of Transportation District 12 on April 2, 2008. Per SAFETEA-LU, this project is eligible for federal-aid funding and is considered to be full oversight under current FHWA-Department of Transportation Stewardship Agreements.

Submittal of an unsigned PSR or an unsigned Project Report to FHWA is required to request federal "engineering and operational acceptability" determination of a new or modified access to the Interstate. Federal "engineering and operational acceptability" determination must be obtained prior to circulation of the environmental document.

13 DISTRICT CONTACTS

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Brad Slawson .....(714) 648-2834
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Traffic Analysis – Albert Grover Associates

14 PROJECT REVIEWS

Project Manager	Vinh Pham	Date: March 26, 2008
FHWA Review	Tay Dam	Date: May 2, 2008
District Maintenance	Farouk Nasir/Massoud Tajik	Date: March 18, 2008
District Safety Review	Mike Flynn/Ed Khosravi	Date: May 21, 2008
District Environmental Branch	Smita Deshpande	Date: March 20, 2008
HQ Design Coordinator	Jim DeLuca	Date: April 21, 2008

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15 RECOMMENDED AND CONCURRENCE BY

RECOMMENDED BY:

DATE: 07/22/08

GARY SLATER
Branch Chief
Project Studies Unit

DATE: 7/22/08

ISAAC ALONSO RICE
Branch Chief, Traffic Operation North
District Program Advisor

CONCURRENCE BY:

DATE: 7-22-08

JANE PEREZ
Acting Deputy District Director
Division of Planning

DATE: 7-22-08

ADNAN MAIAH
Office Chief
District Program/Project Management

DATE: 7/24/08

FRANK LIN
Office Chief
Office of Design

DATE: 7-24-08

SYLVIA VEGA
Deputy District Director
Environmental Analysis

DATE: 7-23-08

JAMES PINHEIRO
Deputy District Director
Operations and Maintenance

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ATTACHMENT 1

COST ESTIMATES

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ROUGH ORDER OF MAGNITUDE COST ESTIMATE

DIST-CO-RTE	**12-ORA-405**
Type of Estimate	**PSR-PDS**
Program Code:	
PM	**10.3/24.1**
EA	**OH100K**
Project No.	

Project Description: **Improvements on I-405 in Orange County**

Limits: **From SR-73 to I-605**

Proposed Improvement (Scope): **Add one general purpose lane, widen or replace existing overcrossings and undercrossings, and reconstruct ramps**

Alternative: **1 Add One General Purpose Lane**

TOTAL ROADWAY ITEMS	$ 683,760,000
TOTAL STRUCTURE ITEMS	$ 264,000,000
SUBTOTAL CONSTRUCTION COSTS	$ 947,760,000
RIGHT OF WAY (Current Value)	$ 42,518,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	$ 990,278,000
SUPPORT COST (25% SUBTOTAL)	$ 247,570,000
TOTAL PROJECT COSTS	$ 1,237,848,000
USE	$ **1,237,900,000**

Note: The capital cost provided in this document are not for programming purposes.

Submitted by Project Engineer	Signature	Kevin A. Haboian	(949) 263-9322	July 21, 2008
		Kevin A. Haboian	Phone No.	Date
Reviewed by OCTA Project Manager	Signature	Dan Phu	(714) 560-5907	July 21, 2008
		Dan Phu	Phone No.	Date
Reviewed by Branch Chief	Signature	Gary Slater	(949) 756-7685	07/22/08
		Gary Slater	Phone No.	Date
Approved by Project Manager	Signature	Vinh Pham	(949) 724-2097	7/24/08
		Vinh Pham	Phone No.	Date

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Unit Cost	Section Cost
Roadway Excavation	722,108	CY	$27	$19,496,910	
Imported Borrow	0	CY	$25	$0	
Clearing & Grubbing	292	ACRE	$4,000	$1,168,000	
Develop Water Supply (5% Roadway Excavation	1	LS	$974,846	$974,846	
				Subtotal Earthwork	$21,639,756
Section 2 Structural Section					
PCC Pavement	104,571	CY	$290	$30,325,641	
Cement Treated Base	121,076	CY	$110	$13,318,399	
Asphalt Concrete (Type A)	154,267	TON	$100	$15,426,697	
Aggregate Base (Class 2)	120,181	CY	$60	$7,210,880	
Aggregate Subbase (Class 2)	240,879	CY	$45	$10,839,541	
Ramp Termini	18,260	CY	$265	$4,838,900	
AC Dike	10,888	TON	$100	$1,088,769	
				Subtotal Structural Items	$83,048,826
Section 3 Drainage					
Drainage Facilities	1	LS	$33,250,000	$33,250,000	
Storm Drains	1	LS	$6,650,000	$6,650,000	
Minor drainage modifications	1	LS	$6,650,000	$6,650,000	
				Subtotal Drainage	$46,550,000

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

Section 4 Specialty Items	Quantity	Unit	Unit Price	Unit Cost
Superelevation Transition	1	LS	$17,000,000	$17,000,000
Guardrail End Treatmeant ET-2000	151	EA	$3,600	$543,600
Install Metal Beam Guardrail	26,525	LF	$35	$928,389
Median Concrete Barrier	64,000	LF	$100	$6,400,000
Treatment BMPs	1	LS	$5,040,000	$5,040,000
Remove K-Rail (Exist)	90,800	LF	$22	$1,997,600
Environmental Mitigation	1	LS	$980,000	$980,000
Water Pollution Control	1	LS	$13,400,000	$13,400,000
Erosion Control	1	LS	$1,400,000	$1,400,000
Retaining Wall	226,192	SQFT	$60	$13,571,497
Sound Wall	620,718	SQFT	$45	$27,932,310
Retaining Wall beneath Sound Wall	44,337	FT	$171-$395	$10,264,027
Tieback Wall	9,760	SQFT	$165	$1,610,400
MSE Wall	69,615	SQFT	$75	$5,221,133
Crash Wall	12,640	SQFT	$226	$2,856,640
Demolition of Existing Walls	620,718	SQFT	$6	$3,724,308
Aesthetic Improvements	1	LS	$1,230,000	$1,230,000
Landscaping	8	EA	$1,000,000	$8,000,000
Local Street Improvement	15	EA	$2,000,000	$30,000,000
Stage Construction	1	LS	$40,400,000	$40,400,000
Placed AC Dike	187,248	LF	$3.00	$561,744
Overhead Sign Structures	1	LS	$14,000,000	$14,000,000
Removed Sound wall	620,718	SQFT	$5	$3,103,590
Fiber Optic Backbone Communication System	1	LS	$8,000,000	$8,000,000
Communication Hubs	1	LS	$2,000,000	$2,000,000
Dynamic Message Signs	1	LS	$1,500,000	$1,500,000
Detection System	1	LS	$5,000,000	$5,000,000
Ramp Meter System	1	LS	$1,610,000	$2,000,000
Cameras System	1	LS	$2,000,000	$2,000,000
Call Box System	1	LS	$2,000,000	$2,000,000
MVP	46	EA	$10,000	$460,000
Resident Engineer	54	MO	$6,000	$324,000

Subtotal Specialty Items $233,449,237

Section 5 Traffic Items

Lighting	1	LS	$5,000,000	$5,000,000
Temporary Traffic Items	1	LS	$1,120,000	$1,120,000
Traffic Signals	1	LS	$7,000,000	$7,000,000
Permanent Traffic Items	1	LS	$6,720,000	$6,720,000
Traffic Control Systems	1	LS	$19,160,000	$19,160,000
Traffic Management Plan	1	LS	$5,000,000	$5,000,000

Subtotal Traffic Items $44,000,000

SUBTOTAL SECTIONS 1-5 $428,687,819

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

Section 6 Minor Items				Unit Cost	Section Cost
Subtotal Sections 1-5	$428,687,819	X	10.00% (5% - 10%)	$42,868,782	
			TOTAL MINOR ITEMS		$42,868,782
Section 7 Roadway Mobilization					
Subtotal Sections 1-6	$471,556,601				
Sum	$471,556,601	X	10.00% (5% - 10%)	$47,155,660	
			TOTAL ROADWAY MOBILIZATION		$47,155,660
Section 8 Roadway Additions					
Supplemental					
Subtotal Sections 1-6	$471,556,601				
Sum	$471,556,601	X	10.00% (5% TO 10%)	$47,155,660	
Contingencies					
Subtotal Sections 1-6	$471,556,601				
Sum	$471,556,601	X	25.00% ( )*	$117,889,150	
			TOTAL ROADWAY ADDITIONS		$165,044,810
			TOTAL ROADWAY ITEMS (Total of sections 1-8)		$683,757,072
			USE		$683,760,000

Estimate Prepared By Raymond Ong (Print Name) (949) 263-9322 6/24/2008

Estimate Checked By Neal Denno (Print Name) (949) 263-9322 (Phone No.) 6/24/2008 (Date)

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

II. STRUCTURES ITEMS

Bridge Name	Bridge Number	Type of Work	Length	Width	$/SQFT	Cost Estimate
SANTA ANA RIVER	55 0258	W	440	21' on North Side & 21' and varies on South Side	$230	$4,403,013
EUCLID ST ON-RAMP CONNECTOR	55 xxxx	N	345	33' & varies	$230	$2,896,390
WARD STREET OC	55 0429	R	316	73	$230	$5,504,305
TALBERT AVENUE OC	55 0260	R	495	105	$230	$12,479,870
BROOKHURST STREET OC	55 0402	R	484	130' & varies	$230	$15,556,400
SLATER AVENUE OC	55 0261	R	400	73	$230	$7,132,800
BUSHARD STREET OC	55 0262	R	400	73	$230	$7,097,660
WARNER AVENUE OC	55 0263	R	520	130	$230	$16,497,573
WARNER AVE ON-RAMP CONNECTOR OC	55 xxxx	N	285	28' & varies	$230	$2,130,490
MAGNOLIA ST ON-RAMP CONNECTOR OC	55 xxxx	N	440	40	$230	$4,048,000
MAGNOLIA STREET OC	55 0264	R	549	98	$230	$12,911,060
HEIL AVENUE POC	55 0407	R	707	10	$190	$1,404,890
NEWLAND STREET OC	55 0265	R	368	78	$230	$6,821,860
EDINGER AVENUE OC	55 0266	R	430	89	$230	$9,329,306
ROUTE 405/39 SEPARATION	55 0267	W	268	11.5' and varies on North Side & 10' and varies on South Side	$260	$1,814,055
ROUTE 39 - N405 ON-RAMP CONNECTOR	55 xxxx	N	311	40	$230	$2,863,500
ROUTE 39/405 NB ON-RAMP CONNECTOR OC	55 xxxx	N	175	35' & varies	$230	$1,529,500
ROUTE 39 -S405 ON-RAMP CONNECTOR	55 xxxx	N	334	41' & varies	$230	$3,264,850
ROUTE 39/405 SB ON-RAMP CONNECTOR OC	55 xxxx	N	160	42	$230	$1,545,600
MCFADDEN AVENUE OC	55 0268	R	431	84	$230	$8,628,288
BOLSA OVERHEAD	55 0269	W	178	40' on North Side & 26' on South Side	$260	$3,075,650
BOLSA AVENUE OC	55 0270	R	464	150' & varies	$230	$16,720,280
GOLDEN WEST STREET OC	55 0271	R	460	148	$230	$16,348,672
NAVY OVERHEAD	55 0272	W	172	35' on East Side & 35' on West Side	$260	$3,164,570
EDWARDS STREET OC	55 0273	R	388	84	$230	$7,939,008
WESTMINSTER AVENUE OC	55 0274	R	463	133	$230	$15,008,010
SPRINGDALE STREET OC	55 0275	R	388	85' & varies	$230	$8,060,810
BOLSA CHICA ROAD OC	55 0276	R	308	145	$230	$10,727,500
RCB Culvert	Varies		Varies	Varies	Varies	$1,548,596

SUBTOTAL STRUCTURES ITEMS	$210,452,506
25% CONTINGENCY	$52,613,127
TOTAL STRUCTURES ITEMS	$264,000,000

Estimate Prepared By Mohsen Mohseni (949) 263-9322 June 15, 2008
Print Name Phone No. Date

(If appropriate, attach additional pages and backup)

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

III. RIGHT OF WAY

	Current Values (Future Use)	Escalation Rates	Escalated Values*
A. Acquisition, including excess lands, damages to remainder(s), and Goodwill	$19,400,000	5.00%	$27,298,000
B. Utility Relocation (State share)	$22,218,000	5.00%	$31,263,000
C. Clearance/Demolition	$50,000	5.00%	$70,000
D. Relocation Assistance	$200,000	5.00%	$281,000
E. Title and Escrow Fees	$650,000	5.00%	$915,000
F. Construction Contract Work		5.00%	$0
TOTAL RIGHT OF WAY (CURRENT VALUES)**	$42,518,000	**TOT. ESC. R/W**	$59,827,000
Use	$42,518,000		

*Escalated to time of ROW Certification in March 2015 at 5% per year compounded annually for 7 years.

**Current total value for use on sheet 1 of 6

Estimate Prepared By Jim Rushing (Print Name) (714) 379-3376 Phone No. June 24, 2008 Date

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DRF:drf

ROUGH ORDER OF MAGNITUDE COST ESTIMATE

DIST-CO-RTE	**12-ORA-405**
Type of Estimate	**PSR-PDS**
Program Code:	
PM	**10.3/24.1**
EA	**OH100K**
Project No.	

Project Description: **Improvements on I-405 in Orange County**

Limits: **From SR-73 to I-605**

Proposed Improvement (Scope): **Add two general purpose lane, widen or replace existing overcrossings and undercrossings, and reconstruct ramps**

Alternative: **2 Add Two General Purpose Lanes**

TOTAL ROADWAY ITEMS	$ 726,690,000
TOTAL STRUCTURE ITEMS	$ 345,000,000
SUBTOTAL CONSTRUCTION COSTS	$ 1,071,690,000
RIGHT OF WAY (Current Value)	$ 272,000,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	$ 1,343,690,000
SUPPORT COST (25% SUBTOTAL)	$ 335,930,000
TOTAL PROJECT COSTS	$ 1,679,620,000
USE	$ **1,679,700,000**

Note: The capital cost provided in this document are not for programming purposes.

Submitted by Project Engineer	Signature	Kevin A. Haboian	(949) 263-9322 Phone No.	July 21, 2008 Date
Reviewed by OCTA Project Manager	Signature	Dan Phu	(714) 560-5907 Phone No.	July 21, 2008 Date
Reviewed by Branch Chief	Signature	Gary Slater	(949) 756-7685 Phone No.	07/22/08 Date
Approved by Project Manager	Signature	Vinh Pham	(949) 724-2097 Phone No.	7/24/08 Date

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Unit Cost	Section Cost
Roadway Excavation	815,520	CY	$27	$22,019,037	
Imported Borrow	0	CY	$25	$0	
Clearing & Grubbing	292	ACRE	$4,000	$1,168,000	
Develop Water Supply (5% Roadway Exca	1	LS	$1,100,952	$1,100,952	
				Subtotal Earthwork	$24,287,989
Section 2 Structural Section					
PCC Pavement	132,646	CY	$290	$38,467,408	
Cement Treated Base	132481	CY	$110	$14,572,951	
Asphalt Concrete (Type A)	152,716	TON	$100	$15,271,564	
Aggregate Base (Class 2)	131,844	CY	$60	$7,910,618	
Aggregate Subbase (Class 2)	260,991	CY	$45	$11,744,585	
Ramp Termini	18,260	CY	$265	$4,838,900	
AC Dike	10,852	TON	$100	$1,085,176	
Realign Center Line		LS	$11,322,315	$11,322,315	
				Subtotal Structural Items	$105,213,516
Section 3 Drainage					
Drainage Facilities	1	LS	$33,250,000	$33,250,000	
Storm Drains	1	LS	$6,650,000	$6,650,000	
Minor drainage modifications	1	LS	$6,650,000	$6,650,000	
				Subtotal Drainage	$46,550,000

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

Section 4 Specialty Items	Quantity	Unit	Unit Price	Unit Cost	
Superelevation Transition	1	LS	$17,000,000	$17,000,000	
Guardrail End Treatmeant ET-2000	151	EA	$3,600	$543,600	
Install Metal Beam Guardrail	26905	LF	$35	$941,661	
Median Concrete Barrier	64000	LF	$100	$6,400,000	
Treatment BMPs	1	LS	$5,040,000	$5,040,000	
Remove K-Rail (Exist)	90,800	LF	$22	$1,997,600	
Environmental Mitigation	1	LS	$980,000	$980,000	
Water Pollution Control	1	LS	$13,400,000	$13,400,000	
Erosion Control	1	LS	$1,400,000	$1,400,000	
Retaining Wall	232,977	SQFT	$60	$13,978,641	
Sound Wall	639,340	SQFT	$45	$28,770,279	
Retaining Wall beneath Sound Wall	45,667	FT	$171-$395	$10,571,948	
Tieback Wall	10,053	SQFT	$165	$1,658,712	
MSE Wall	71,704	SQFT	$75	$5,377,766	
Crash Wall	13,019	SQFT	$226	$2,942,339	
Demolition of Existing Walls	620,718	SQFT	$6.18	$3,836,037	
Aesthetic Improvements	1	LS	$1,270,000	$1,270,000	
Landscaping	8	EA	$1,000,000	$8,000,000	
Local Street Improvement	15	EA	$2,000,000	$30,000,000	
Stage Construction	1	LS	$40,400,000	$40,400,000	
Placed AC Dike	186,630	LF	$3.00	$559,890	
Overhead Sign Structures	1	LS	$14,000,000	$14,000,000	
Remove Sound Wall	639,340	SQFT	$5	$3,196,698	
Fiber Optic Backbone Communication Sys	1	LS	$8,000,000	$8,000,000	
Communication Hubs	1	LS	$2,000,000	$2,000,000	
Dynamic Message Signs	1	LS	$1,500,000	$1,500,000	
Detection System	1	LS	$5,000,000	$5,000,000	
Ramp Meter System	1	LS	$1,610,000	$2,000,000	
Cameras System	1	LS	$2,000,000	$2,000,000	
Call Box System	1	LS	$2,000,000	$2,000,000	
MVP	46	EA	$10,000	$460,000	
Resident Engineer	54	MO	$6,000	$324,000	
			Subtotal Specialty Items		$235,549,172

Section 5 Traffic Items

Lighting	1	LS	$5,000,000	$5,000,000	
Temporary Traffic Items	1	LS	$1,120,000	$1,120,000	
Traffic Signals	1	LS	$7,000,000	$7,000,000	
Permanent Traffic Items	1	LS	$7,680,000	$7,680,000	
Traffic Control Systems	1	LS	$18,200,000	$18,200,000	
Traffic Management Plan	1	LS	$5,000,000	$5,000,000	
			Subtotal Traffic Items		$44,000,000

SUBTOTAL SECTIONS 1-5 $455,600,677

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

Section 6 Minor Items				Unit Cost	Section Cost
Subtotal Sections 1-5	$455,600,677	X	10.00% (5% - 10%)	$45,560,068	
			TOTAL MINOR ITEMS		$45,560,068
Section 7 Roadway Mobilization					
Subtotal Sections 1-6	$501,160,744				
Sum	$501,160,744	X	10.00% (5% - 10%)	$50,116,074	
			TOTAL ROADWAY MOBILIZATION		$50,116,074
Section 8 Roadway Additions					
Supplemental					
Subtotal Sections 1-6	$501,160,744				
Sum	$501,160,744	X	10.00% (10%)	$50,116,074	
Contingencies					
Subtotal Sections 1-6	$501,160,744				
Sum	$501,160,744	X	25.00% ( )*	$125,290,186	
			TOTAL ROADWAY ADDITIONS		$175,406,261
			TOTAL ROADWAY ITEMS (Total of sections 1-8)		$726,683,079
			USE		$726,690,000

		Phone #	Date
Estimate Prepared By	Raymond Ong (Print Name)	(949) 263-9322	6/24/2008
Estimate Checked By	Neal Denno (Print Name)	(949) 263-9322	6/24/2008

DIST-CO-RTE **12-ORA-405**
PM **10.3/24.1**
EA **OH100K**

II. STRUCTURES ITEMS

Bridge Name	Bridge Number	Type of Work	Length	Width	$/SQFT	Cost Estimate
SANTA ANA RIVER	55 0258	W	484	12' on North Side & 16' and varies on South Side	$230	$3,542,473
EUCLID ST ON-RAMP CONNECTOR	55 xxxx	N	380	33' & varies	$230	$3,562,560
WARD STREET OC	55 0429	R	355	73	$230	$6,164,152
TALBERT AVENUE OC	55 0260	R	567	105	$230	$14,206,595
BROOKHURST STREET OC	55 0402	R	539	130' & varies	$230	$19,105,530
SLATER AVENUE OC	55 0261	R	453	73	$230	$8,026,028
BUSHARD STREET OC	55 0262	R	453	73	$230	$9,741,010
WARNER AVENUE OC	55 0263	R	572	130	$230	$18,052,373
WARNER AVE ON-RAMP CONNECTOR OC	55 xxxx	N	314	28' & varies	$230	$2,620,503
MAGNOLIA ST ON-RAMP CONNECTOR OC	55 xxxx	N	484	40	$230	$4,452,800
MAGNOLIA STREET OC	55 0264	R	616	98	$230	$14,421,240
HEIL AVENUE POC	55 0407	R	778	10	$190	$1,532,409
NEWLAND STREET OC	55 0265	R	415	73	$230	$7,182,753
EDINGER AVENUE OC	55 0266	R	487	88	$230	$10,390,158
ROUTE 405/39 SEPARATION	55 0267	W	295	11.5' and varies on North Side & 10' and varies on South Side	$260	$2,222,369
ROUTE 39 - N405 ON-RAMP CONNECTOR	55 xxxx	N	342	40	$230	$3,149,850
ROUTE 39/405 NB ON-RAMP CONNECTOR OC	55 xxxx	N	193	35' & varies	$230	$1,881,285
ROUTE 39 -S405 ON-RAMP CONNECTOR	55 xxxx	N	367	41' & varies	$230	$4,015,766
ROUTE 39/405 SB ON-RAMP CONNECTOR OC	55 xxxx	N	176	42	$230	$1,700,160
MCFADDEN AVENUE OC	55 0268	R	506	80	$230	$9,611,768
BOLSA OVERHEAD	55 0269	W	196	50' on North Side & 35' on South Side	$260	$5,946,300
BOLSA AVENUE OC	55 0270	R	534	150' & varies	$230	$21,293,255
GOLDEN WEST STREET OC	55 0271	R	556	145	$230	$19,216,197
NAVY OVERHEAD	55 0272	W	189	37' on East Side & 37' on West Side	$260	$5,133,389
EDWARDS STREET OC	55 0273	R	424	80	$230	$8,235,248
WESTMINSTER AVENUE OC	55 0274	R	528	133	$230	$16,996,360
SPRINGDALE STREET OC	55 0275	R	438	85' & varies	$230	$10,045,917
BOLSA CHICA ROAD OC	55 0276	R	330	145	$230	$11,461,200
ROUTE 22/405 SEPARATION	55 331R	$0	957	0	$0	$13,132,650
I-405/SR 22 HOV CONNECTOR	55 xxxx	$0	1,254	0	$0	$16,824,800
RCB Culvert	Varies		Varies	Varies	Varies	$1,904,773

SUBTOTAL STRUCTURES ITEMS	$275,771,871
25% CONTINGENCY	$68,942,968
TOTAL STRUCTURES ITEMS	$345,000,000

Estimate Prepared By Mohsen Mohseni (949) 263-9322 June 15, 2008
Print Name Phone No. Date

(If appropriate, attach additional pages and backup)

DIST-CO-RTE	**12-ORA-405**
PM	**10.3/24.1**
EA	**OH100K**
PP NO.	**0**

III. RIGHT OF WAY

	Current Values (Future Use)	Escalation Rates	Escalated Values*
A. Acquisition, including excess lands, damages to remainder(s), and Goodwill	$200,000,000	5.00%	$281,420,000
B. Utility Relocation (State share)	$50,000,000	5.00%	$70,355,000
C. Clearance/Demolition	$10,000,000	5.00%	$14,071,000
D. Relocation Assistance	$10,000,000	5.00%	$14,071,000
E. Title and Escrow Fees	$2,000,000	5.00%	$2,814,000
F. Construction Contract Work		5.00%	$0
TOTAL RIGHT OF WAY (CURRENT VALUES)**	$272,000,000	**TOT. ESC. R/W**	$382,731,000
Contingency			
Use	$272,000,000		

*Escalated to time of ROW Certification in March 2015 at 5% per year compounded annually for 7 years.

**Current total value for use on sheet 1 of 6

Estimate Prepared By	Neal Denno	(949) 263-9322	June 24, 2008
	(Print Name)	Phone No.	Date

ATTACHMENT 2

RIGHT-OF-WAY DATA SHEET

UTILITY INFORMATION SHEET

RAILROAD INFORMATION SHEET

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET
(Form #)

To: OCTA
Attn.: XXX

Date 01/02/08
Dist 12 Co Ora Rte 405, P/M 10.3/24.1
Project Description: I-405 PSR/PDS

Subject: Right of Way Data

Alternative No. 1

This Alternate meets the criteria for a Design/Build project: Yes__X__ No___

1. Right of Way Cost Estimate:

		Current Value Future Use	Escalation Rate*	Escalated Value
A.	**Total Acquisition Cost** Acquisition, including Excess Lands, Damages, and Goodwill. Project Permit Fees.	$19,400,000	5 %	$27,298,000
B.	**Utility Relocation (State Share)**	$22,218,000	5 %	$31,263,000
C.	**Relocation Assistance**	$200,000	5 %	$281,000
D.	**Clearance/Demolition**	$50,000	5 %	$70.000
E.	**Title and Escrow**	$650,000	5 %	$915,000
F.	**Railroad Relocation**	$0	5 %	$0
G.	**Total Estimated Cost**	$42,518,000		$59,827,000
H.	**Construction Contract Work**	NONE		

*Escalation Rate is 5% per year for 7 years

2. Current Date of Right of Way Certification: Current Date of Right of Way Certification is est. to be 03/2015

3. Parcel Data:

Type		Dual/Appr	Utilities
X			U4-1
A	309		-2
B			-3
C			-4
D			U5-7
E	XXXX		-8
F	XXXX		-9

RR Involvements	
None	
C&M Agrmt	1
Svc Contract	
Design	
Const.	
Lic/RE/Clauses (US Navy RR)	1
Misc. R/W Work	
RAP Displ	
Clear/Demo	X
Condemnation	
Excess	

Total: 309
Areas: R/W Ha
Entered PMCS Screens

No. Excess Parcels NONE
__/__/__ By _____

Entered AGRE Screen (Railroad data only) __/__/__ By _____

4. Are there any major items of construction contract work?
Yes _____ No X (If yes, explain.)

N/A

5. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.).

The right-of-way required for this project lies within the cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley and Costa Mesa. Right of way impacts for this alternative require 1 single family residential total take with relocation and 4 partial takes. Acquisitions affecting 18 commercial properties, 2 industrial properties, and 1 multi-family dwelling will be required. Temporary construction easements from 227 single family residential properties, 5 multi-family residential properties, 18 commercial properties, 14 industrial properties, 12 street or drainage rights-of-way, and 1 school will also be required.

6. Is there an effect on assessed valuation? Yes ____Not Significant _X___ No _____(If yes, explain.)

7. Are utility facilities or rights of way affected? Yes__X__No ____ (If yes, attach Utility Information Sheet Exhibit 4-EX-5.)

8. Are Railroad facilities or rights of way affected? Yes __X__ No ____ (If yes, attach Railroad Information Sheet Exhibit 4-EX-6.)

9. Were any previously unidentified sites with hazardous waste and/or material found? Yes _____ None Evident

10. Are RAP displacements required? Yes__X__ No ____ (If yes, provide the following information.)

No. of single family __1___ No. of business/nonprofit __X_____

No. of multi-family ___X__ No. of farms _____

Based on Draft/Final Relocation Impact Statement/Study dated __pending__ , it is anticipated that sufficient replacement housing (will/will not) be available without Last Resort Housing.

11. Are there material borrow and/or disposal sites required? Yes _____ No __X__ (If yes, explain.)

12. Are there potential relinquishments and/or abandonment's? Yes ____ No __X__ (If yes, explain.)

13. Are there any existing and/or potential airspace sites? Yes _____ No __X__ (If yes, explain.)

14. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if district proposes less than PMCS lead time and/or if significant pressures for project advancement are anticipated).

Based upon the R/W requirements of Page 1 of this Data Sheet, it is anticipated that R/W will require a lead time of __12__ months from the date regular appraisals begin to project certification.

15. Is it anticipated that Caltrans staff will perform all Right of Way work? Yes __X__No __ (If no discuss.)

Evaluation Prepared By:

Right of Way: Name: Marita Taylor Date 01-07-08

Railroad: Name: Kathryn Grack Date 04-20-08

Utilities: Name: Bill Johns Date 11-2007

Recommended for Approval:

_____
Jim Rushing, Project Manager (Paragon-Partners)

I have personally reviewed this Right of Way Data Sheet and all supporting information. I certify that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

_____
OCTA Project Manager

July 8, 2008
Date

UTILITY INFORMATION SHEET
HIGH RISK AND SIGNIFICANT UTILITIES

1. Name of utility companies involved in the project:

A. Orange County Sanitation District (OCSD)
B. The Southern California Gas Company
C. Chevron
D. Southern California Edison (SCE)
E. Cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley, and Costa Mesa
F. Long Beach Gas and Oil
G. Pacific Pipeline
H. Paramount Petroleum

2. Types of facilities and agreements required (The following list is a preliminary pass at the identification of high risk utilities that, based on preliminary review, may be impacted by the widening project: (South to North)

Fairview Road Vicinity

- City of Costa Mesa 39" Storm Drain
- Overhead SCE Power South of overpass

Harbor Blvd. Vicinity

- City of Costa Mesa 8' x 5' RCB Storm Drain
- SCE 12 kV underground service – multiple lines
- SCG 6" Gas pipeline at underpass

Santa Ana River Vicinity

- Major Overhead SCE Power South of River

Ellis/Euclid Vicinity

- Major Overhead SCE Power South of Underpass
- Major Overhead SCE Power North of Underpass
- 72" Sewer – Feeds OCSD Plant 1 south of interchange
- 51" Sewer – Feeds OCSD Plant 1 south of interchange
- Multiple Sewer lines to OCSD Plant 1

Ward Street Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Talbert Avenue Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Brookhurst Avenue Vicinity

- Underground SCE Power on overpass 12kV

Slater Avenue Vicinity

- Underground SCE Power on overpass –unknown voltage assumed 12kV

Bushard Street Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Warner Avenue Vicinity

- Underground SCE Power on overpass 12kV
- Communication conduits – assumed FibreOptic lines

Magnolia Avenue Vicinity

- No high-risk facilities identified

Heil/Pedestrian Bridge Vicinity

Possible high voltage power

Newland Avenue Vicinity

- Major Overhead Power South of overpass

Edinger Avenue Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Beach Blvd. Vicinity

- SCE 12 kV underground service – multiple lines
- Major Overhead Power- may interfere with off ramp development

Golden West Street Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power south of overpass
- Multiple Oil transmission pipelines on overpass
- Multiple Oil transmission pipeline corridor north of overpass
- 16" Gas transmission Pipeline
- Possible fiber optic communications on overpass

Edwards Street Vicinity

- Underground SCE Power on overpass Unknown Voltage
- 3" Gas transmission pipeline
- Possible fiber optic communications on overpass
- Overhead Power north of overpass

Westminster Blvd. Vicinity

- Underground SCE Power on overpass 12kV
- Multiple Water pipelines south of overpass
- 3" Gas transmission Pipeline
- Possible fiber optic communications
- 6" and 10" Gas transmission at NB offramp

Springdale Street Vicinity

- Major Overhead Power north of Overpass

Valley View Street Vicinity

- 14" and 16" Gas transmission Pipeline (Parallel on north side)
- 16" Gas Transmission line (diagonal crossing to Weapons Station)

SR22 Transition Area

- Underground SCE Power on overpass 12kV
- Possible Fiber Optic Communications along northbound shoulder
- Parallel power along northbound shoulder

Seal Beach Blvd. Vicinity

- Underground SCE Power on overpass 12kV
- Major utility corridor north of overpass
- Multiple Gas transmission pipelines on south side of Overpass
- Possible fiber optic communications on overpass

3. **Additional Information concerning utility involvements on this project:**

Prior rights information and agreements are not verified at this time.

It is assumed that the impacted utility systems easement rights vary due to the history of property ownership. As such, it is assumed that utility relocation costs related to this project will be shared responsibility between utility owners and the project funding agency (OCTA).

4. PMCS Input Information: Total estimated cost of utility relocation on this project:

Assumed estimated costs (based only on reference drawing review):

Fairview Overpass	$1,030,000
Harbor Blvd. Underpass	$550,000
Euclid/Ellis Underpass	$730,000
Ward St. Overpass	$200,000
Talbert Overpass	$575,000
Brookhurst St. Overpass	$430,000
Slater Overpass	$255,000
Bushard Overpass	$520,000
Magnolia Overpass	$140,000
Warner Overpass	$550,000
Newland Overpass	$750,000
Edinger Overpass	$440,000
Beach Blvd. Underpass	$530,000
McFadden Overpass	$220,000
Bolsa Overpass	$250,000
Golden West Overpass	$1,930,000
Edwards Ave. Overpass	$230,000
Westminster Ave. Overpass	$970,000
Springdale Ave. Overpass	$560,000
Valley View Overpass	$990,000
Seal Beach Blvd Overpass	$1,030,000
SUB-TOTAL	$12,880,000
Engineering/Inspection & Const.Mgt.	$1,932,000
CONTINGENCY @ 50%	$7,406,000
TOTAL	**$22,218,000**

Estimated Utility Owner Responsibilities

A.	Orange County Sanitation District	$0
B.	The Gas Company	$0
C.	Chevron, Pacific Pipeline, Paramount Petroleum	$2,000,000
D.	Southern California Edison	$5,000,000
E.	Cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley, and Costa Mesa (Sewer, Water & Electrical)	$2,000,000
F.	Fiber Optics (ATT, XO TimeWarner)	$2,000,000

Prepared By: *Bill Johns* *Date* *Nov 2007*
Utility Estimator

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RAILROAD INFORMATION SHEET

(Form #)

EXHIBIT
4-EX-6

1. Describe railroad facilities or right of way affected.

   The freeway widening will affect two, grade-separated railroad crossings, both of which are overheads above a single track:
   1. Union Pacific RR (CPUC crossing no. 001BAA-518.96-A), Bridge Number 55.0269 at Postmile 17.21.
   2. US Navy Railroad (CPUC crossing no. 122SB-1.32-A), Bridge Number 55.0272, at Postmile 18.36.

2. When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facility be more cost effective than construction of a facility to perpetuate the rail service? Yes _____ No __X___
   (If yes, explain)

3. Discuss types of agreements and right required from the railroads. Are grade crossings requiring service contracts or grade separations requiring construct and maintenance agreements involved?

   The UPRR will require a permanent easement for additional freeway right-of-way which includes 15 feet beyond the bridge rail of the proposed widened bridge on both sides of the freeway. A Construction and Maintenance agreement will be required.

   The US Navy Railroad will require a license for additional freeway right-of-way which includes 15 feet beyond the bridge rail of the proposed widened bridge on both sides of the freeway.

4. Remarks (non-operating railroad right of way involved?): None

5. PMCS Input Information

RR Involvements	
None	
C&M Agreement	1
Service Contract	
Design	
Const.	
Lic/RE/Clauses	1

Prepared By:

Kathryn Grack — 4/20/08

Right of Way Railroad Coordinator — Date

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET
(Form #)

To: OCTA
Attn.: XXX

Date 01/02/08
Dist 12 Co Ora Rte 405, P/M 10.3/24.1
Project Description: I-405 PSR/PDS

Subject: Right of Way Data

Alternative No. 2

This Alternate meets the criteria for a Design/Build project: Yes__X__ No___

1. Right of Way Cost Estimate:

		Current Value Future Use	Escalation Rate*	Escalated Value
A.	**Total Acquisition Cost** Acquisition, including Excess Lands, Damages, and Goodwill. Project Permit Fees.	$200,000,000	5 %	$281,420,000
B.	**Utility Relocation (State Share)**	$50,000,000	5 %	$70,355,000
C.	**Relocation Assistance**	$10,000,000	5 %	$14,071,000
D.	**Clearance/Demolition**	$10,000,000	5 %	$14,071,000
E.	**Title and Escrow**	$2,000,000	5 %	$2,814,000
F.	**Railroad Relocation**	$0	5 %	$0
G.	**Total Estimated Cost**	$272,000,000		$382,731,000
H.	**Construction Contract Work**	NONE		

*Escalation Rate is 5% per year for 7 years

2. Current Date of Right of Way Certification: Current Date of Right of Way Certification is est. to be 03/2015.

3. Parcel Data:

Type		Dual/Appr	Utilities
X			U4-1
A	333		-2
B			-3
C			-4
D			U5-7
E	XXXX		-8
F	XXXX		-9

RR Involvements	
None	
C&M Agrmt	1
Svc Contract	
Design	
Const.	
Lic/RE/Clauses (US Navy RR)	1
Misc. R/W Work	
RAP Displ	
Clear/Demo	X
Condemnation	
Excess	

Total: 333
Areas: R/W Ha
Entered PMCS Screens

No. Excess Parcels NONE
__/__/__ By _____

Entered AGRE Screen (Railroad data only) __/__/__ By _____

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET
(Form #)

4. **Are there any major items of construction contract work?**
Yes _____ No X (If yes, explain.)

N/A

5. **Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.).**

The right-of-way required for this project lies within the cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley and Costa Mesa. Right of way impacts for this alternative are estimated to require acquisition of 87 single family residential properties. Beyond the Alternative 1 identified right-of-way, there will be an additional 29,200 square feet of multi-family residential land some of which includes buildings; 144,850 square feet of commercial land some of which includes buildings; 8,300 square feet of public right-of-way currently in use as local streets and drainage channels; 1,500 square feet of public parks; and 79,600 square feet of federal military reservation land.

6. **Is there an effect on assessed valuation?** Yes ____Not Significant _X___ No _____(If yes, explain.)

7. **Are utility facilities or rights of way affected?** Yes__X__No ____ (If yes, attach Utility Information Sheet Exhibit 4-EX-5.)

8. **Are Railroad facilities or rights of way affected?** Yes __X___ No ____ (If yes, attach Railroad Information Sheet Exhibit 4-EX-6.)

9. **Were any previously unidentified sites with hazardous waste and/or material found?** Yes _____ None Evident

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY DATA SHEET
(Form #)

10. Are RAP displacements required? Yes__X__ No ____ (If yes, provide the following information.)

No. of single family __87___ No. of business/nonprofit __X_____

No. of multi-family ___X__ No. of farms _____

Based on Draft/Final Relocation Impact Statement/Study dated __pending__ , it is anticipated that sufficient replacement housing (will/will not) be available without Last Resort Housing.

11. Are there material borrow and/or disposal sites required? Yes _____ No __X__ (If yes, explain.)

12. Are there potential relinquishments and/or abandonment's? Yes ____ No __X___ (If yes, explain.)

13. Are there any existing and/or potential airspace sites? Yes _____ No __X___ (If yes, explain.)

14. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if district proposes less than PMCS lead time and/or if significant pressures for project advancement are anticipated).

Based upon the R/W requirements of Page 1 of this Data Sheet, it is anticipated that R/W will require a lead time of __12__ months from the date regular appraisals begin to project certification.

15. Is it anticipated that Caltrans staff will perform all Right of Way work? Yes __X___No __ (If no discuss.)

Evaluation Prepared By:

Right of Way: Name: Neal Denno Date 04-18-08

Railroad: Name: Kathryn Grack Date 04-20-08

Utilities: Name: Neal Denno Date 04-18-08

Recommended for Approval:

_____
Neal Denno, Deputy Project Manager (Parsons)

I have personally reviewed this Right of Way Data Sheet and all supporting information. I certify that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

_____
OCTA Project Manager

July 8, 2008
Date

UTILITY INFORMATION SHEET
HIGH RISK AND SIGNIFICANT UTILITIES

1. Name of utility companies involved in the project:

A. Orange County Sanitation District (OCSD)
B. The Southern California Gas Company
C. Chevron
D. Southern California Edison (SCE)
E. Cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley, and Costa Mesa
F. Long Beach Gas and Oil
G. Pacific Pipeline
H. Paramount Petroleum

2. Types of facilities and agreements required (The following list is a preliminary pass at the identification of high risk utilities that, based on preliminary review, may be impacted by the widening project: (South to North)

Fairview Road Vicinity

- City of Costa Mesa 39" Storm Drain
- Overhead SCE Power South of overpass

Harbor Blvd. Vicinity

- City of Costa Mesa 8' x 5' RCB Storm Drain
- SCE 12 kV underground service – multiple lines
- SCG 6" Gas pipeline at underpass

Santa Ana River Vicinity

- Major Overhead SCE Power South of River

Ellis/Euclid Vicinity

- Major Overhead SCE Power South of Underpass
- Major Overhead SCE Power North of Underpass
- 72" Sewer – Feeds OCSD Plant 1 south of interchange
- 51" Sewer – Feeds OCSD Plant 1 south of interchange
- Multiple Sewer lines to OCSD Plant 1

Ward Street Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Talbert Avenue Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Brookhurst Avenue Vicinity

- Underground SCE Power on overpass 12kV

Slater Avenue Vicinity

- Underground SCE Power on overpass –unknown voltage assumed 12kV

Bushard Street Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Warner Avenue Vicinity

- Underground SCE Power on overpass 12kV
- Communication conduits – assumed FibreOptic lines

Magnolia Avenue Vicinity

- No high-risk facilities identified

Heil/Pedestrian Bridge Vicinity

Possible high voltage power

Newland Avenue Vicinity **$16,000,000**

- Major Overhead Power South of overpass

Edinger Avenue Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power north of overpass

Beach Blvd. Vicinity

- SCE 12 kV underground service – multiple lines
- Major Overhead Power- may interfere with off ramp development

Golden West Street Vicinity

- Underground SCE Power on overpass 12kV
- Overhead Power south of overpass
- Multiple Oil transmission pipelines on overpass
- Multiple Oil transmission pipeline corridor north of overpass
- 16" Gas transmission Pipeline
- Possible fiber optic communications on overpass

Edwards Street Vicinity

- Underground SCE Power on overpass Unknown Voltage
- 3" Gas transmission pipeline
- Possible fiber optic communications on overpass
- Overhead Power north of overpass

Westminster Blvd. Vicinity

- Underground SCE Power on overpass 12kV
- Multiple Water pipelines south of overpass
- 3" Gas transmission Pipeline
- Possible fiber optic communications
- 6" and 10" Gas transmission at NB offramp

Springdale Street Vicinity

- Major Overhead Power north of Overpass

Valley View Street Vicinity

- 14" and 16" Gas transmission Pipeline (Parallel on north side)
- 16" Gas Transmission line (diagonal crossing to Weapons Station)

SR22 Transition Area

- Underground SCE Power on overpass 12kV
- Possible Fiber Optic Communications along northbound shoulder
- Parallel power along northbound shoulder

Seal Beach Blvd. Vicinity

- Underground SCE Power on overpass 12kV
- Major utility corridor north of overpass
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- Possible fiber optic communications on overpass

3. **Additional Information concerning utility involvements on this project:**

Prior rights information and agreements are not verified at this time.

It is assumed that the impacted utility systems easement rights vary due to the history of property ownership. As such, it is assumed that utility relocation costs related to this project will be shared responsibility between utility owners and the project funding agency (OCTA).

4. PMCS Input Information: Total estimated cost of utility relocation on this project:

Assumed estimated costs (based only on reference drawing review):

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Harbor Blvd. Underpass	$550,000
Euclid/Ellis Underpass	$730,000
Ward St. Overpass	$200,000
Talbert Overpass	$575,000
Brookhurst St. Overpass	$430,000
Slater Overpass	$255,000
Bushard Overpass	$520,000
Magnolia Overpass	$140,000
Warner Overpass	$550,000
Newland Overpass	$750,000
Edinger Overpass	$440,000
Beach Blvd. Underpass	$530,000
McFadden Overpass	$220,000
Bolsa Overpass	$250,000
Golden West Overpass	$1,930,000
Edwards Ave. Overpass	$230,000
Westminster Ave. Overpass	$970,000
Springdale Ave. Overpass	$560,000
Valley View Overpass	$990,000
Seal Beach Blvd Overpass	$1,030,000
Longintudinal Relocations	**$16,105,000**
SUB-TOTAL	**$28,985,000**
Engineering/Inspection & Const.Mgt.	**$4,347,750**
CONTINGENCY @ 50%	**$16,666,375**
TOTAL	**$49,999,125**
	Call $50,000,000

Estimated Utility Owner Responsibilities

A.	Orange County Sanitation District	$0
B.	The Gas Company	$0
C.	Chevron, Pacific Pipeline, Paramount Petroleum	$2,000,000
D.	Southern California Edison	$5,000,000
E.	Cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley, and Costa Mesa (Sewer, Water & Electrical)	$2,000,000
F.	Fiber Optics (ATT, XO TimeWarner)	$2,000,000

Prepared By: Neal Denno *Date* 4/15/08
Utility Estimator

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RAILROAD INFORMATION SHEET

(Form #)

EXHIBIT
4-EX-6

1. Describe railroad facilities or right of way affected.

   The freeway widening will affect two, grade-separated railroad crossings, both of which are overheads above a single track:
   1. Union Pacific RR (CPUC crossing no. 001BAA-518.96-A), Bridge Number 55.0269 at Postmile 17.21.
   2. US Navy Railroad (CPUC crossing no. 122SB-1.32-A), Bridge Number 55.0272, at Postmile 18.36.

2. When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facility be more cost effective than construction of a facility to perpetuate the rail service? Yes _____ No __X___
   (If yes, explain)

3. Discuss types of agreements and right required from the railroads. Are grade crossings requiring service contracts or grade separations requiring construct and maintenance agreements involved?

   The UPRR will require a permanent easement for additional freeway right-of-way which includes 15 feet beyond the bridge rail of the proposed widened bridge on both sides of the freeway. A Construction and Maintenance agreement will be required.

   The US Navy Railroad will require a license for additional freeway right-of-way which includes 15 feet beyond the bridge rail of the proposed widened bridge on both sides of the freeway.

4. Remarks (non-operating railroad right of way involved?): None

5. PMCS Input Information

RR Involvements	
None	
C&M Agreement	1
Service Contract	
Design	
Const.	
Lic/RE/Clauses	1

Prepared By:

Kathryn Grack — 4/20/08

Right of Way Railroad Coordinator — Date

ATTACHMENT 3

RAILROAD CORRESPONDENCE

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PARSONS
2201 Dupont Drive, Suite 200, Irvine, CA 92612• (949) 263-9322 • Fax: (949) 263-1225 • www.parsons.com

December 4, 2007

Lieutenant Commander Kevin Norton
Public Works Officer
Naval Weapons Station Seal Beach
800 Seal Beach Boulevard
Seal Beach, California 90740

Re: I-405 PSR/PDS; I-405 Rail Crossing in Westminster, California
CPUC Crossing Number 122SB-1.32-A

Lieutenant Commander Norton:

The I-405 Project Study Report/ Project Development Support (PSR/PDS) project is an alternatives study, which will evaluate various configurations for future widening of each side of the I-405 freeway. The project limits extend along the I-405 from the interchange with Harbor Blvd, north to the I-605 freeway in Orange County. The freeway widening will affect two, grade-separated railroad crossings, one of which is the Navy track (CPUC crossing no. 122SB-1.32-A). Construction of this project is planned to begin in 2015.

The purpose of this letter is to inform the Naval Weapons Station Seal Beach of this upcoming freeway improvement project, as well as to initiate coordination and define design criteria with respect to the Navy's crossing requirements. A location map and as-built drawing are enclosed for your reference.

The as-built drawing shows the existing minimum vertical clearance as 23'± and horizontal clearances as 21'4"± from the southerly face of column to the track centerline, and 21'5"± from the northerly face of column to the track centerline. The proposed horizontal and vertical clearances for the bridge extensions are planned to provide at least as much clearance as provided by the existing structure and will meet all CPUC clearance requirements. The length of track under the bridge will increase by approximately 50' on the east and west sides of the bridge.

With the above information, we would greatly appreciate your response to the following questions:

- Does the Naval Weapons Station have future plans to modify this track, which could impact the design of the freeway widening?
- Do any other railroads (e.g. UPRR) use this track?
- What are the current and expected daily train counts?
- Does the Naval Weapons Station have standard design criteria or guidelines for the design/modification of grade-separated crossings?
- Is there a cost associated with the Naval Weapons Station's review of the design drawings? If so, what would that cost typically be?
- Are there any other design considerations, costs or concerns of which we should be aware?

If I may provide further information or if you have any questions, please do not hesitate to contact me at (949) 263-9322, or by email at kathryn.grack@parsons.com.

Sincerely yours,

Kathryn A. Grack, P.E.
Senior Engineer

cc: File
Encl: Location map
As-built drawing

PARSONS
2201 Dupont Drive, Suite 200, Irvine, CA 92612• (949) 263-9322 • Fax: (949) 263-1225 • www.parsons.com

December 4, 2007

Mr. Dan Miller
Manager – Special Projects, Industry and Public Projects
Union Pacific Railroad
2015 South Willow Avenue
Bloomington, California 92316

Re: I-405 PSR/PDS; I-405 Rail Crossing in Westminster, California
CPUC Crossing Number 001BAA-518.96-A

Mr. Miller:

The I-405 Project Study Report/ Project Development Support (PSR/PDS) project is an alternatives study, which will evaluate various configurations for future widening of each side of the I-405 freeway. The project limits extend along the I-405 from the interchange with Harbor Blvd, north to the I-605 freeway in Orange County. The freeway widening will affect two, grade-separated railroad crossings, one if which is a UPRR track (CPUC crossing no. 001BAA-518.96-A). Construction of this project is planned to begin in 2015.

The purpose of this letter is to inform the UPRR of this upcoming freeway improvement project, as well as to initiate coordination and define design criteria with respect to the UPRR's crossing requirements. A location map and as-built drawing of the crossing are enclosed for your reference.

The as-built drawing shows the existing minimum vertical clearance as 23'0"± and horizontal clearances as 24'4"± from the westerly face of column to the track centerline, and 21'8"± from the easterly face of column to the track centerline. The proposed horizontal and vertical clearances for the bridge extensions are planned to provide at least as much clearance as provided by the existing structure and will meet all CPUC clearance requirements. The length of track under the bridge will increase by approximately 40' on the south side and 60' on the north side of the bridge.

With the above information, we would greatly appreciate your response to the following questions:

- Does the UPRR have future plans to modify this track, which could impact the design of the freeway widening?
- What are the current and expected daily train counts?
- Do any other railroads use this track?
- What is the typical cost associated with the UPRR design drawing review?
- Are there any other design considerations, costs or concerns of which we should be aware?

If I may provide further information or if you have any questions, please do not hesitate to contact me at (949) 263-9322, or by email at kathryn.grack@parsons.com.

Sincerely yours,

Kathryn A. Grack, P.E.
Senior Engineer

cc: File
Encl: Location map
As-built drawing

Denno, Neal

From: DANJMILLER@UP.COM
Sent: Monday, December 17, 2007 11:27 AM
To: Grack, Kathryn
Cc: Denno, Neal
Subject: Re: I-405 PSR/PDS; 001BAA-518.96-A future widening of the I-405 freeway inOrange County

Attachments: pic26299.jpg; 071204-Letter-UPRR-with encl.pdf


pic26299.jpg


071204-Letter-UPRR-with encl.p...

1. Future Plans - no.
2. Current - two trains per day. Future - Unknown.
3. No.
4. $3500.
5. No.

(Embedded image moved to file: pic26299.jpg)

Thanks,

Dan J. Miller
Mgr Spec Proj & Ind Pub Proj
2015 S. Willow Ave.
Bloomington, CA 92316
Tel: 909-685-2288
Fax: 402-997-4284

"Grack, Kathryn" <Kathryn.Grack@parsons.com> 12/04/2007 03:59 PM

To: <DANJMILLER@UP.COM>
cc: "Denno, Neal" <Neal.Denno@parsons.com>
Subject: I-405 PSR/PDS; 001BAA-518.96-A future widening of the I-405 freeway in Orange County

Dan,

Per the voice mail I left for you this morning, attached is a pdf copy of correspondence related to the I-405 PSR/PDS project. The hard copy of this letter was put in the mail today. This is a planning study for future widening of the I-405 freeway in Orange County. The bridge that crosses above UPRR tracks (crossing 001BAA-518.96-A) will be widened. Your comment on the questions listed in the attachment is much appreciated.

<<071204-Letter-UPRR-with encl.pdf>>
Best regards,
Kathryn Grack, P.E.
PARSONS
2201 Dupont Drive, Suite 200
Irvine, California 92612
949.263.9322 ext. 267
949.263.1225 FAX (See attached file: 071204-Letter-UPRR-with encl.pdf)

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ATTACHMENT 4

PROJECT INITIATION DOCUMENT DESIGN SCOPING INDEX

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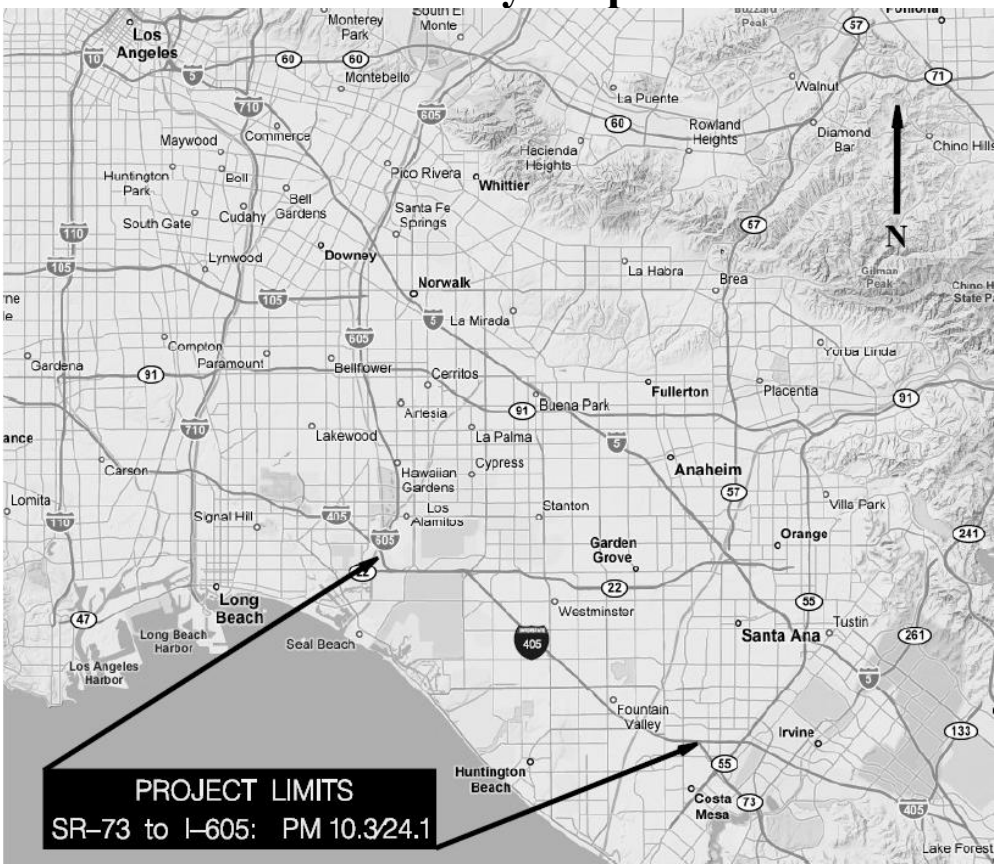
PROJECT INITIATION DOCUMENT
DESIGN SCOPING INDEX

Vicinity Map



Today's Date:	July 8, 2008
Status (Initial, Update):	Initial

General Information:

District:	County:	Route:	Post Mile	EA
12	ORA	405	10.3/24.1	0H100K

Project Manager	Vinh Pham	Phone #	949-724-2097
Task Manager		Phone #	
Project Engineer	Jason Ly	Phone #	949-724-2171
Design Functional Manager	Matthew Cugini	Phone #	949-724-2507

General Project Descriptions:	Add one or two general purpose lanes in each direction to I-405 from the area of the Euclid and Brookhurst interchanges to the area of the Seal Beach Boulevard, SR-22/7th Street, and I-605 interchanges. Add auxiliary lanes between most interchanges from Euclid Street to Valley View Street. Reconfigure interchanges from Euclid Street to Valley View Street to improve operations.

Project Need:	The need for the proposed improvements is based on four principal problems. First, demand currently exceeds capacity during peak periods resulting in significant travel delays (defined as LOS E or F) along the corridor within the proposed project limits. Second, operational problems occur on the freeway, primarily because of physical bottlenecks due to "lane drops". Third, there are a variety of interchange and ramp deficiencies. Fourth, some existing geometric and operational deficiencies present potential safety concerns.
Project Purpose:	The purpose of the proposed project is to meet four primary objectives and one secondary objective. The four primary objectives are to: 1. increase the capacity of the freeway to meet more of the existing and forecast demand, increase peak period corridor speeds, and reduce peak period corridor travel times; 2. improve traffic operations on the freeway mainline; 3. enhance interchange operations; and 4. enhance safety. The secondary objective is to minimize the amount of right-of-way acquisition needed for the project. A locally preferred strategy (LPS) was adopted by the OCTA Board of Directors on October 14, 2005 as the culmination of the Major Investment Study (MIS) conducted for the corridor. The *I-405 Major Investment Study Final Report* (February 2006) states (p. 93): "It is clear from the process used to identify Alternative 4 as the LPS that the selection of Alternative 4 was predicated upon a balance between its benefits and its impacts, *especially its right-of-way impacts.*" (emphasis added)

Item	Considerations	Yes/No/Specific	Comments (summarize pertinent information. assumptions and reference location of detailed information):
1. Project Setting (refer to Planning Scoping Checklist)	Rural or Urban?	Urban	
	Current Land Uses: (e.g., industrial, light industry, commercial, agricultural residential etc).	Fully developed with residential, commercial and industrial uses	
	Adjacent Land Uses:	Residential, commercial and industrial	
	Existing Landscaping:	Yes	

The following pages are to be used for each alternative provided that the scope is significantly different. If a route has been adopted as a freeway, a decision must be made as to whether or not the project will address improvements to the existing traversable highway or move to construction of a freeway facility.

Alternative 1

Item	Considerations		Yes/No/Specific	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Design Concept and Route Matters	1.	Design Concept?	Yes	
		Freeway/Expressway/ Conventional Highway	Freeway	
		Mixed highway and transit	No	
		Mixed highway and rail	No	
		Urban	Urban	
		Other		
	2.	Existing Route Adoption Date	1959	Added to the Freeway and Expressway System
	3.	New Route Adoption Proposed?	No	
	4.	Existing Freeway Agreement Date	Yes	• With city of Fountain Valley on November 4, 1964. • With City of Huntington Beach on September 18, 1978. • With City of Westminster on January 22, 1974. • With City of Garden Grove on February 8, 1956. • With City of Seal Beach on November 1, 1962 (later superseded but no date).
	5	New Freeway Agreement Proposed?	Yes	May be needed for proposed new ramp from eastbound Ellis Avenue to I-405 southbound
	6.	Public Road Connection Proposed?	No	
Design Criteria	1.	Design speed for highway facilities within the project limit miles per hour	65 mph	
	2.	Design Period: (10 yr/15 yr/20yr)	20 yr	
		Construction Year	2019	
		Design Year	2039-40	2030 was used for the PSR/PDS because 2035 OCTAM was not available. Will be changed to a year to be determined in the 2039-40 range during the PA/ED phase.

	3.	Design Capacity - Level of Service to be maintained over the design period:	E	Alternative 1 increases mainline general purpose capacity by 25%. On/off-ramp storage capacity is increased substantially.
		Mainline	E-F	Design substantially improves LOS and reduces peak period congestion, but does not fully address LOS F conditions
		Ramp		
		Local Street		
		Weaving Sections		
	4.	Design Vehicle Selection		
		STAA	X	Mainline
		California	X	For interchanges, will be changed to STAA standards during PA/ED phase
		Bus		

Proposed Roadbed and Structure Widths

Forecasted Average Daily Traffic volumes	375,000 – PM 10.3/13.8 281,000 – PM 13.8/20.8 390,000 – PM 20.8/24.1
Percent truck volume	3%

	Roadbed Width			Structure Width		
State Highway	Existing	Proposed	Standard	Existing	Proposed	Standard
Lane widths/#	11-12	12	12	11-12	12	12
Left Shoulder	2	10-15	10	2	10-15	10
Right Shoulder	10	10	10	10	10	10
Median Width	6	22-32	22	6	22-32	22
Bicycle lane						
Sidewalk						
Planting strip						
Local Streets						
Lane widths/#	10-11	12	12			
Left Shoulder	0	0-2	2			
Right Shoulder	0	2-4	4			
Median Width		4				
Bicycle lane	0	5	5			
Sidewalk	5	5	5			
Planting strip						

Item	Considerations	Yes/No/Specific	Comments (summarize pertinent information, assumptions and reference location of

				detailed information):
Roadway Design Scoping	1. Mainline Operations	Main lane highway widening?	Yes	
		Existing pavement to be rehabilitated with Asphalt Concrete/Rubberized AC/PCC?	No	Pavement rehab north of Beach Blvd recently completed and south of Beach Blvd planned for 2010-2015 but not currently programmed.
		Widen existing facility from _10_ lanes to _12_lanes.	Yes	Alternative 1: Widen from 10 to 12 lanes (including 2 HOV lanes) plus auxiliary lanes at numerous locations.
		Local street structures to span _all proposed freeway__ lanes.	Yes	Number of freeway lanes to be spanned varies, but are proposed to equal or exceed the number of lanes in the 1999 RCR. The number of arterial lanes on overcrossings is proposed to meet or exceed the MPAH.
		Curb extensions		
		Shoulder improvements	Yes	
		Bicycle lanes	Yes	
		Pedestrian refuge islands	Yes	
		Sidewalks	Yes	
		Right of Way acquisition required for _some__ lanes.	Yes	Right-of-way acquisition varies by location in the corridor but generally the proposed facility would fit within the existing right-of-way.
		Upgrade existing facility to: Expressway/Freeway/ Controlled Access Highway/ Traversable Highway Standards?	No	
		Improve Vertical Clearance	Yes	
		Adequate Falsework Clearance	Yes	
		Traffic calming features	No	

Item	Considerations	Yes/No/Specific	Comments (summarize pertinent information, assumptions and reference location of detailed

				information):
Roadway Design Scoping	2. Ramp/Street Intersection Improvements	New Signals?	Yes	
		Modify Existing Signals?	Yes	
		Right Turn Lanes	Yes	
		Widening for Localized Through lanes?		
		Merging Lanes?	Yes	
		Deceleration/Acceleration lanes?	Yes	
		Left Turn Lanes?	Yes	
		>300 VPH Left Turn (Requires Double Left Turn Lane)	Yes	
		Interchange Spacing?	Yes	
		Ramps Intersect Local Street < 4% grade?	No	Some ramps intersect at greater than 4% grade
		Intersection Spacing?	No	
		Exit Ramps >1,500 VPH (Requires two lane exit)	Yes	
		Single lane ramps exceeding 300 M widened to Two lanes	Yes, where feasible	
		Curb Ramps?	Yes	
		Pedestrian Facilities?	Yes	
		Other?		
Operational Improvements	Truck Climbing Lane	Sustained Grade exceeding 2% and Total Rise Exceeds 15 m?	NA	
		Other?		
	Auxiliary Lanes	600 m between Successive On-Ramps?	Yes	
		Two lane Exit Ramps have 400 m Auxiliary Lane?	Yes	
		Weaving < 500 m between off-ramp and on-ramp?	Yes	
		Other?		
Right of Way Access Control	Existing access control extends at least 15 m beyond end of curb return, radius or taper?		Yes	
	New construction access control extends at least 30 m (urban areas) or 100 m (rural areas) beyond end of curb returns, radius or taper?		No	
	Other?			
Highway Planting and Irrigation	Clearing and Grubbing?			
	Relocate Existing Irrigation Facilities?			
	Highway Planting and Irrigation (including median and roadside)			

Item	Considerations	Yes/No/Specific	Comments (summarize pertinent information, assumptions and

			reference location of detailed information):
Roadside Management	Vegetation control treatments (road edge, guardrails, signs, drainage facilities, miscellaneous pavement narrow areas, etc.)		
	Modernization and clustering of facilities and hardware (removing and replacing other items), gore area pavement		
	Rehabilitate gore area pavement and pavement beyond gore areas (remove and replace miscellaneous pavement and curbs	No	
	Contour grading, slope rounding, stepped slopes and topsoil reapplication	No	Will complete in PS&E
	Side slopes/embankment slope	No	Will complete in PA/ED or PS&E
Safety	Off-Freeway Access (gate, access road, and stairways)		
	Maintenance Vehicle Pull-Out	No	Will include in PA/ED
	Adequate safety working conditions		
	Relocate roadside facilities/features (cabinets, poles, pull boxes and vaults) away from traffic	No	Will complete in PS&E
Hydraulics/ Stormwater (Refer to the Stormwater data sheet)	Erosion Control?	Yes	Preliminary BMPs described in Storm Water Data Report
	Drainage?	Yes	See Concept Drainage Report
	Slope Design?	Yes	Maximum slopes identified in Storm Water Data Report
Structures (Refer to Structures Scoping Checklist or APS)	New Bridge?	Yes	16 arterial overcrossing replacements, 4 widenings, and 8 new bridges
	Bridge Rehab?	No	
	Retaining Wall	Yes	19 retaining walls
	Bicycle or Pedestrian Overcrossing/Undercrossing	Yes	Replacement of one pedestrian overcrossing
	Other		See DES Scoping Checklist for more details of all above
	On STRAIN list for:		
Other	Class I Bikeway (bicycle path)	Yes	One existing Class 1 crosses below an overcrossing to be widened

Alternative 2

Item	Considerations		Yes/No/Specific	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Design Concept and Route Matters	1.	Design Concept?	Yes	
		Freeway/Expressway/ Conventional Highway	Freeway	
		Mixed highway and transit	No	
		Mixed highway and rail	No	
		Urban	Urban	
		Other		
	2.	Existing Route Adoption Date	1959	Added to the Freeway and Expressway System
	3.	New Route Adoption Proposed?	No	
	4.	Existing Freeway Agreement Date	Yes	• With city of Fountain Valley on November 4, 1964. • With City of Huntington Beach on September 18, 1978. • With City of Westminster on January 22, 1974. • With City of Garden Grove on February 8, 1956. With City of Seal Beach on November 1, 1962 (later superseded but no date).
	5	New Freeway Agreement Proposed?	Yes	May be needed for proposed new ramp from eastbound Ellis Avenue to I-405 southbound
	6.	Public Road Connection Proposed?	No	
Design Criteria	1.	Design speed for highway facilities within the project limit miles per hour	65 mph	
	2.	Design Period: (10 yr/15 yr/20yr)	20 yr	
		Construction Year	2019	
		Design Year	2039-40	2030 was used for the PSR/PDS because 2035 OCTAM was not available. Will be changed to a year to be determined in the 2039-40 range during the PA/ED phase.

	3.	Design Capacity - Level of Service to be maintained over the design period:	E	Alternative 2 increases mainline general purpose capacity by 50%. On/off-ramp storage capacity is increased substantially.
		Mainline	E-F	Design substantially improves LOS and reduces peak period congestion, but does not fully address LOS F conditions
		Ramp		
		Local Street		
		Weaving Sections		
	4.	Design Vehicle Selection		
		STAA	X	Mainline
		California	X	For interchanges, will be changed to STAA standards during PA/ED phase
		Bus		

Proposed Roadbed and Structure Widths

Forecasted Average Daily Traffic volumes	375,000 – PM 10.3/13.8 281,000 – PM 13.8/20.8 390,000 – PM 20.8/24.1
Percent truck volume	3%

	Roadbed Width			Structure Width		
State Highway	Existing	Proposed	Standard	Existing	Proposed	Standard
Lane widths/#	11-12	12	12	11-12	12	12
Left Shoulder	2	10	10	2	10	10
Right Shoulder	10	10	10	10	10	10
Median Width	6	22	22	6	22	22
Bicycle lane						
Sidewalk						
Planting strip						
Local Streets						
Lane widths/#	10-11	12	12			
Left Shoulder	0	0-2	2			
Right Shoulder	0	2-4	4			
Median Width		4				
Bicycle lane	0	5	5			
Sidewalk	5	5	5			
Planting strip						

Item	Considerations	Yes/No/Specific	Comments (summarize pertinent information, assumptions and reference location of

				detailed information):
Roadway Design Scoping	1. Mainline Operations	Main lane highway widening?	Yes	
		Existing pavement to be rehabilitated with Asphalt Concrete/Rubberized AC/PCC?	No	Pavement rehab north of Beach Blvd recently completed and south of Beach Blvd planned for 2010-2015 but not currently programmed.
		Widen existing facility from _10_ lanes to _14_lanes.	Yes	Alternative 2: Widen from 10 to 14 lanes (including 2 HOV lanes) plus auxiliary lanes at numerous locations.
		Local street structures to span _all proposed freeway__ lanes.	Yes	Number of freeway lanes to be spanned varies, but are proposed to equal or exceed the number of lanes in the 1999 RCR. The number of arterial lanes on overcrossings is proposed to meet or exceed the MPAH.
		Curb extensions		
		Shoulder improvements	Yes	
		Bicycle lanes	Yes	
		Pedestrian refuge islands	Yes	
		Sidewalks	Yes	
		Right of Way acquisition required for _some__ lanes.	Yes	Right-of-way acquisition varies by location in the corridor but the proposed facility would exceed the width of the existing right-of-way by approximately 2-22 feet.
		Upgrade existing facility to: Expressway/Freeway/ Controlled Access Highway/ Traversable Highway Standards?	No	
		Improve Vertical Clearance	Yes	
		Adequate Falsework Clearance	Yes	
		Traffic calming features	No	

Item	Considerations	Yes/No/Specific	Comments (summarize pertinent information, assumptions and reference location of

				detailed information):
Roadway Design Scoping	2. Ramp/Street Intersection Improvements	New Signals?	Yes	
		Modify Existing Signals?	Yes	
		Right Turn Lanes	Yes	
		Widening for Localized Through lanes?		
		Merging Lanes?	Yes	
		Deceleration/Acceleration lanes?	Yes	
		Left Turn Lanes?	Yes	
		>300 VPH Left Turn (Requires Double Left Turn Lane)	Yes	
		Interchange Spacing?	Yes	
		Ramps Intersect Local Street < 4% grade?	No	Some ramps intersect at greater than 4% grade
		Intersection Spacing?	No	
		Exit Ramps >1,500 VPH (Requires two lane exit)	Yes	
		Single lane ramps exceeding 300 M widened to Two lanes	Yes, where feasible	
		Curb Ramps?	Yes	
		Pedestrian Facilities?	Yes	
		Other?		
Operational Improvements	Truck Climbing Lane	Sustained Grade exceeding 2% and Total Rise Exceeds 15 m?	NA	
		Other?		
	Auxiliary Lanes	600 m between Successive On-Ramps?	Yes	
		Two lane Exit Ramps have 400 m Auxiliary Lane?	Yes	
		Weaving < 500 m between off-ramp and on-ramp?	Yes	
		Other?		
Right of Way Access Control	Existing access control extends at least 15 m beyond end of curb return, radius or taper?		Yes	
	New construction access control extends at least 30 m (urban areas) or 100 m (rural areas) beyond end of curb returns, radius or taper?		No	
	Other?			
Highway Planting and Irrigation	Clearing and Grubbing?			
	Relocate Existing Irrigation Facilities?			
	Highway Planting and Irrigation (including median and roadside)			

Item	Considerations	Yes/No/Specific	Comments (summarize pertinent information,

			assumptions and reference location of detailed information):
Roadside Management	Vegetation control treatments (road edge, guardrails, signs, drainage facilities, miscellaneous pavement narrow areas, etc.)		
	Modernization and clustering of facilities and hardware (removing and replacing other items), gore area pavement		
	Rehabilitate gore area pavement and pavement beyond gore areas (remove and replace miscellaneous pavement and curbs	No	
	Contour grading, slope rounding, stepped slopes and topsoil reapplication	No	Will complete in PS&E
	Side slopes/embankment slope	No	Will complete in PA/ED or PS&E
Safety	Off-Freeway Access (gate, access road, and stairways)		
	Maintenance Vehicle Pull-Out	No	Will include in PA/ED
	Adequate safety working conditions		
	Relocate roadside facilities/features (cabinets, poles, pull boxes and vaults) away from traffic	No	Will complete in PS&E
Hydraulics/ Stormwater (Refer to the Stormwater data sheet)	Erosion Control?	Yes	Preliminary BMPs described in Storm Water Data Report
	Drainage?	Yes	See Concept Drainage Report
	Slope Design?	Yes	Maximum slopes identified in Storm Water Data Report
Structures (Refer to Structures Scoping Checklist or APS)	New Bridge?	Yes	16 arterial overcrossing replacements, 4 widenings, and 8 new bridges
	Bridge Rehab?	No	
	Retaining Wall	Yes	19 retaining walls
	Bicycle or Pedestrian Overcrossing/Undercrossing	Yes	Replacement of one pedestrian overcrossing
	Other		See DES Scoping Checklist for more details of all above
	On STRAIN list for:		
Other	Class I Bikeway (bicycle path)	Yes	One existing Class 1 crosses below an overcrossing to be widened

ATTACHMENT 5

PDS TRAFFIC FORECASTING, ANALYSIS AND OPERATIONS SCOPING CHECKLIST

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PDS Traffic Forecasting, Analysis and Operations Scoping Checklist

Project Information

District 12 County Orange Route I-405 Post Mile 10.3/24.1 EA OH100K

Description:

Add one or two general purpose lanes in each direction to I-405 from the area of the Euclid and Brookhurst interchanges to the area of the Seal Beach Boulevard, SR-22/7th Street, and I-605 interchanges. Add auxiliary lanes between most interchanges from Euclid Street to Valley View Street. Reconfigure interchanges from Euclid Street to Valley View Street to improve operations.

Project Manager: Vinh Pham
Phone # 949-724-2097
Project Engineer: Jason Ly
Phone # 949-724-2171
Traffic Forecasting Functional Manager: Firooz Hamedani
Phone # 949-724-2230
Traffic Operations Functional Manager: Isaac Alonso Rice
Phone # 949-724-2929

Traffic Forecasting, Traffic Analysis Scoping

- Existing (Year 2005) Traffic Volumes and Operating Conditions: Existing traffic volumes were collected using various available sources and analysis of existing traffic operating conditions was conducted.

- Baseline – No Build (Year 2030) Traffic Volumes and Operating Conditions: Future traffic volumes were projected for Year 2030 using the regional Orange County Transportation Analysis Model (OCTAM). The objective of this phase was to forecast operating conditions expected to result from general regional growth and the implementation of RTIP projects by the Year 2030. During PA/ED phase the forecast and analysis will be updated to a Year in the 2035-40 range.

- Alternative 1 – Add One General Purpose Lane (Year 2030): Future traffic volume forecast for Alternative 1 was conducted using OCTAM model. During

PA/ED phase the forecast and analysis will be updated to a Year in the 2035-40 range..

- Alternative 2 – Add Two General Purpose Lanes (Year 2030): Future traffic volume forecast for Alternative 2 was conducted using OCTAM model. During PA/ED phase the forecast and analysis will be updated to a Year in the 2035-40 range.

- Freeway Capacity Analysis: FREQ simulation analysis tool was used to evaluate existing, baseline and project Alternatives 1 and 2 for I-405 Freeway between SR-73 and I-605 freeways. During PA/ED phase the forecast and analysis will be updated to a Year in the 2035-40 range.

- Impacts and Mitigation: Traffic operation deficiencies identified based on the above analysis are documented in the PSR/PDS and the *Interchange Traffic Analysis Report for Interstate 405 Freeway Project Study Report/Project Development Support* draft report. During PA/ED phase the forecast and analysis will be updated to a Year in the 2035-40 range.

- Comparison of Alternatives: Based on statement of Purpose and Need and associated evaluation results, a preferred alternative will be recommended in the PA/ED phase.

Traffic Operations Scoping

Traffic analyses of existing and projected future volumes indicate that the existing lanes on I-405 Freeway between Euclid Street and I-605 freeway (lanes vary from 10 to14 lanes) will not adequately accommodate existing and future (Year 2030) traffic volumes. The proposed project would add one or two general purpose lanes in each direction along with auxiliary lanes at selected locations.

Project Screening

1. Project Features: New R/W? Yes Excavation or fill? Yes

2. Project Setting: Interstate 405 Freeway, Orange County

Rural or Urban: Urban

Current land uses: Transportation, Utilities, Residential, Commercial, Industrial uses and Open Space.

Adjacent land uses: Transportation, Utilities, Residential, Industrial, Commercial uses and Open Space.

Existing Traffic Operational Conditions and Warrants Supporting the Need for the Improvement

Mainline highway:

Congestion and over-capacity conditions during peak hours as documented in I-405 PSR/PDS need additional mainline capacity.

Ramp intersection:

Existing and forecast congestion and ramp storage deficiencies, as documented in *Interchange Traffic Analysis Report for Interstate 405 Freeway Project Study Report/Project Development Support* draft report, need improvements to interchanges and ramp intersections.

Merge / diverge:

Bottlenecks at merge locations, single lane exit ramps with high volumes, and short weaving distances as documented in I-405 PSR/PDS need reconfiguration of interchanges and provision of auxiliary lanes.

Street intersection

Improvements needed at selected arterial intersections in the immediate vicinity of freeway interchanges to improve traffic operations as documented in *Interchange Traffic Analysis Report for Interstate 405 Freeway Project Study Report/Project Development Support* draft report.

Weaving / merging (spacing)

Short weaving sections on C-D roads and mainline at Brookhurst Street, Beach Boulevard, and Magnolia/Warner interchanges need improvement with braided ramps and auxiliary lanes.

Other

_____

_____

Describe facilities for pedestrians and bicycles (e.g., marked non-intersection pedestrian crosswalks, intersections with bicycle paths, etc.)

Bicycles and pedestrians are prohibited on I-405. The OCTA Commuter Bikeways Strategic Plan (Bike Plan) (adopted August 10, 2001) shows one Class I bikeway facility crossing I-405 within the proposed project limits. That bikeway runs along the Santa Ana River bank and crosses beneath the bridge carrying the freeway over the

river and Euclid Street. Several Class II bikeways cross the freeway on arterial overcrossings. The proposed project would accommodate these facilities as part of any overcrossing replacements. Bridge profiles to be developed in the PA/ED phase of the project will consider ADA requirements for sidewalk grades.

Traffic Study and Analysis Anticipated

Traffic Modeling Assumptions

√ Use Local Model
o Update New Model
o New Model
√ Existing Traffic Counts
o New Traffic Counts
o Historical Growth
o General Plan (GP) Buildout
o Pro-Rate GP Growth

√ Existing Year (X)
√ Design Year (X)
o Interim Year ( )
Other
_____
_____

Traffic Analysis

√ Mainline LOS
√ Merge/Diverge LOS
√ Ramp Int. LOS
√ Adjacent IC LOS
o Ramp Metering (open)
o Ramp Metering (later)
√ Left/Right Turn Storage
√ Accident / Safety Analysis
√ Intersection Queues
√ Construction Staging
√ Project Staging
√ TMP Staging
√ VDS Staging (temporary microwave monitoring stations)

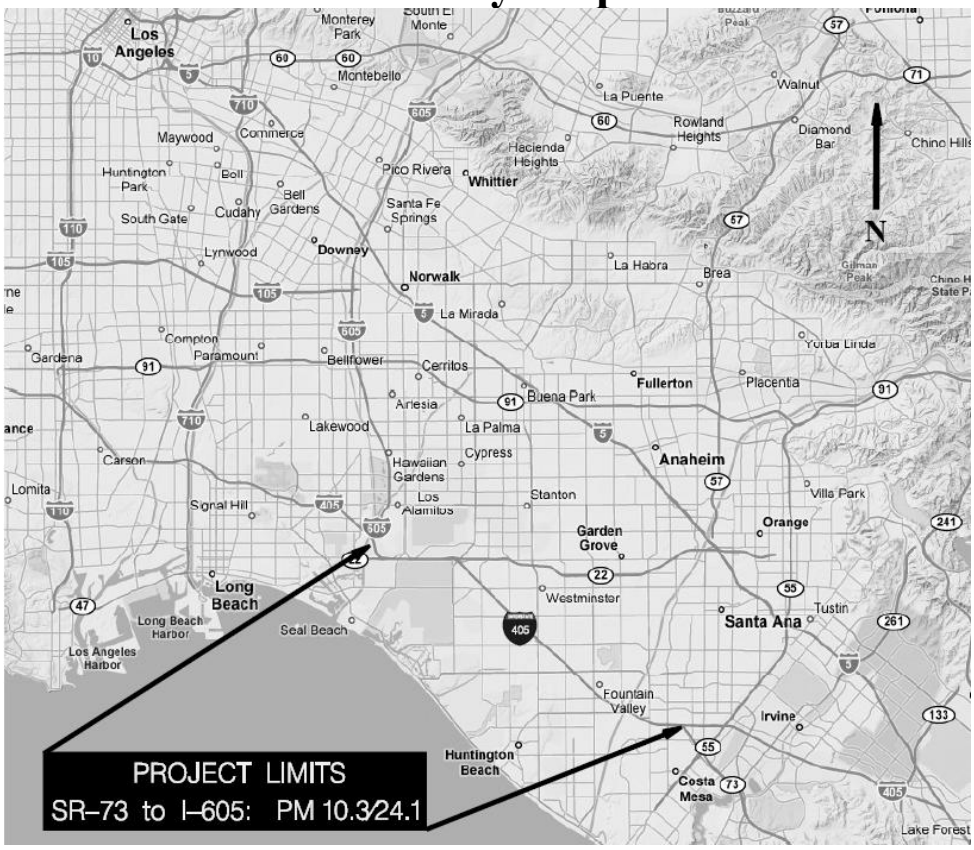
Other

_____
_____

Traffic Operations Scoping

Traffic Operational Improvements

Vicinity Map



√ Auxiliary Lanes
- √ Intersection Improvements
  - o Truck Climbing Lane

√ New Signals
- √ Modify Signals
  - √ Merging Improvements

√ Weaving Improvements
- √ Deceleration / Acceleration Lanes

Other

_____

_____

Traffic Management Systems

√ Ramp Meters
o HOV Ramp Bypass
o Mainline HOV Lanes
√ Detector Systems
√ Detector Loops
√ Detector Lead-in-cables
√ VDS Staging (temporary microwave monitoring stations)
√ Communication Networks (fiber optic, telephone, etc.)
√ Closed Circuit Television
√ Changeable Message Sign
√ Highway Advisory Radio
Other
_____
_____

Discuss strategies (technical analysis, public outreach, etc.) to secure local agency and public support to implement HOV lanes and ramp metering:

N/A

Preliminary Traffic Forecasting Evaluation provided by:

Traffic Forecasting Anup Kulkarni Date May 4, 2007

Preliminary Traffic Operations Evaluation provided by:

Traffic Operation Engineer Chalap Sadam Date February 22, 2008

Traffic Electrical Engineer N/A Date _____

ATTACHMENT 6

DIVISION OF ENGINEERING SERVICES PSR(PDS) SCOPING CHECKLIST

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Division of Engineering Services
PSR(PDS) Scoping Checklist

Project Information

District 12 County ORA Route 405 Kilometer Post (Post Mile) PM 10.3/24.1

EA 0H100K Project Description**:** Build Alternative 1 would add a single general purpose freeway lane in each direction of I-405 from Euclid Street to the I-605 interchange. Build Alternative 2 would add one general purpose lane in each direction as in Build Alternative 1, plus a second lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street.

Project Manager Vinh Pham Phone # 949-724-2097

District Project Engineer Jason Ly Phone # 949-724-2171

DES Consultant Manager Engineer (if applicable) Kevin A. Haboian

DES Project Coordination Engineer **John Cosmez (916) 227-8434**

Project Scope

Describe and identify in the following sections a general description of all improvements anticipated as part of the project scope that will require DES functional unit involvement. The project should be discussed in sufficient detail to accurately identify the involvement of DES to study the various alternatives. The PSR(PDS) is used to program support $ for the Project Report and Environmental Document Phase of the project ONLY, and to commit to a schedule for the completion PR & ED phase.

Check applicable boxes describing proposed scope of project.

- ☐ New Expressway/Freeway on new alignment
- ☐ Construct Interchange
- ☐ Modify Interchange
- ☒ Bridge Replacement (New alignment? ☒ Yes ☐ No)
- ☐ Bridge Rehabilitation
- ☒ New Bridge
- ☐ Bridge Seismic Retrofit
- ☐ Other Roadway Realignment
- ☐ Emergency/Storm Damage
- ☒ Bridge Widening
- ☐ Curve Correction
- ☐ Building Project
- ☐ Median Barrier Retrofit
- ☐ Construct Passing Lane
- ☒ Soundwall/Retaining Wall
- ☐ Other Design: Explain:
- ☒ Widen Highway
- ☐ Rockfall Project
- ☐ Left-turn Pocket
- ☐ Modify Slope
- ☐ Stabilize Subgrade
- ☐ Stabilize Roadway
- ☐ Landslide/Slip-out

Proposed Scope of DES Design Work:

The alternatives proposed are:
Alternative 1: Build Alternative 1 would add a single general purpose freeway lane in each direction of I-405 from Euclid Street to the I-605 interchange.
Alternative 2: Build Alternative 2 would add one general purpose lane in each direction as in

Build Alternative 1, plus a second lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street.
Alternative 3:
Alternative 4:

Project Cost

For PSR (PDS) projects, the following section is to be used for each alternative, provided that the scope is significantly different.

Alternative #1 & 2

Project Cost Range ($ 1000's)		Cost of Largest Structure ($ 1000's)
Roadway	$615-799 million	$21.3 mill
Structure**	$238-380 million	
Total	$1.11-1.85 billion including support costs	

**Structure Cost Range to be provided by one of the following below:

☒ Consultant ☐ Structure Design Technical Liaison.

Project Scope Breakdown by DES Function

Bridge Design Services (check applicable boxes)

Design by:

☐ Office of Structure Design
☐ Structure Maintenance Design
☐ Office of Structure Contract Management (Consultant Design Oversight)
☒ Office of Special Funded Projects (Consultant Design Oversight)

Bridge Information:

☒ New Bridge(s)	Number 7	Bridge Name(s) & No(s). See Attached
☒ Bridge Replacement(s)	Number17	Bridge Name(s) & No(s). See Attached
☒ Bridge Widening(s)	Number 4	Bridge Name(s) & No(s). See Attached
☐ Bridge Rail Replacement(s)	Number	Bridge Name(s) & No(s).

Other DES functional units required for Structure Work

☒ Structure Hydraulics (include if bridge is over or adjacent to water)
☒ Geotechnical Services (Structure Foundations)

Soundwall and/or Retaining Wall Design (non-district designed)

☒ Soundwall(s)	Number23	Estimated Max. Ht	Estimated Total Length See
☒ Retaining walls(s)	Number14	Estimated Max. Ht	Estim Total
☒ MSE walls(s)	Number2	Estimated Max. Ht	Estimated

SEE ATTACHED

			Total Length

Technical Specialist Design

Anticipated insertable plan sheet(s) check below:

☒ Culvert(s)	Number 5
☐ Barrier(s)	Number
☒ Signs and Overhead Structures	Number 65
☒ Other Design:	Explain: **Crash Wall Design**

Transportation Architecture Design

☐ Design New Building(s)	Explain:
☐ Remodel Existing Buildings(s)	Explain:
☒ Bridge Aesthetics Evaluation	Explain: Confirm structure aesthetic criteria
☐ Build scale model	Explain:
☐ Other Aesthetics work	Explain:

Electrical, Mechanical, Water & Wastewater Design

☐ Pumping Plants	Explain:
☐ Movable bridge, drawbridg	Explain:
☐ Lighting control system for facilities	Explain:
☐ Sanitary Systems	Explain:

Materials Engineering & Testing Services

Pavement

☐ Rigid ☐ Flexible	Average Grade	Average Superelevation
☐ Deflection Studies Required	No. of Locations	Lane/miles to be tested

Consultation and Inspection

☐ Loop detectors	☐ Signal & Lighting Products	☐ Changeable Message Signs, Closed Circuit TV
☐ Concrete Bridge	☐ Steel Bridge	

Corrosion Tests

☐ Soil	☐ Concrete	☐ Cathodic Protection System

Other

☐ Special Products:	Explain

DES Geotechnical Services

Is Oversight for consultant prepared geotechnical reports required?

☒ Yes ☐ No

Has the Geotechnical Design Liaison or other geotechnical person been contacted?

☒ Yes ☐ No If yes, who? Jon Hamaguchi

Terrain:	☒ Flat	☐ Rolling	☐ Mountainous	
Cuts:	Est. Max Height (m)	Est. Volume (m^3):	☐ New	☐ Widen
Fills:	Est. Max Height (m)25 ft	Est. Volume (m^3):53,400 y3	☒ New	☒ Widen

Structures

☐ Retaining Walls	Number	Est. Max. Height	Est. length (m)	☐ Cut	☐ Fill
☐ Soundwalls	Number	Est. Avg. Height	☐ Standard Plan	☐ Non-Standard Plan	
☐ Overhead Sign Foundations			Number		

☐ Changeable Message Sign Foundations	Number

Other:

☒ Special Studies (slope stability, rockfall, erosion, seepage, ground water, settlement, liquefaction, slipout repair, rock slope, etc.) Explain Check for liquefaction potential and lateral spreading.

☐ Existing Maintenance Problems: Explain:

Engineering Technology*

☐ Aerial Photography			
☐ Raster Imaging:	Est. Total Length (km)	Est. Avg. Width (m):	
☐ DTM Modeling (non-district):	Est. Total Length (km)	Est. Total Width (m):	
☐ Mapping:	Est. Total Length (km)	Est. Avg. Width (m)	Scale:ddd

***Note: A Photogrammetry Service Request**-PSR(PDS) must be completed and submitted to DES Photogrammetry by the District Photogrammetry Coordinator.

Division of Engineering Services Workload Estimate for PSR(PDS)				
WBS	**Alternative Number**			
	1	**2**	**3**	**4**
100				
150				
160				
165				
175				
180				
Total PY's per Alternative				
			Total Project PY's	

Additional Studies, Investigations or Research from DES

Preliminary Evaluation provided by:
Project Coordination Engineer Mohsen Mohseni

Reviewed by:
Project Manager _____Dan Phu_____ Date _7/8/08_____

I-405 PSR/PDS Technical Specialist Design (Alternative 1 & 2*)

[Reinforced Concrete Box]

Postmile	Bridge Number	Bridge Name	Type of Construction	Structure Type Assumed	Estimated Lengthening of Existing Culvert (ft)	Width of Culvert Lengthening (ft)	Ft^2 (Lengthening)	$/Ft^2$ (Note 2)	Culvert Cost $ (Note 1)	Remarks
_012.40	55 0259	SERVICE ROAD UC	L	R.C.B.	15' on North side & 59' on South side	21	1,659	$322	$499,786	Single 18' x 17' R.C.B.
_012.90	55 0477	EAST VALLEY CHANNEL	L	R.C.B.	30' on North side & 40' on South side	22	1,540	$115	$177,710	Double 10' x 7' R.C.B. culvert
_015.00	55 0478	OCEAN VIEW CHANNEL	L	R.C.B.	85	26	2,231	$143	$318,700	Double 12' x 10' R.C.B. culvert lengthening
_015.49	55 0479	HEIL AVENUE DRAIN	L	R.C.B.	70' on East side & 75' on West side	17	2,513	$61	$153,200	Triple 5' x 2' R.C.B. culvert lengthening
_015.87	55 0480	EAST GARDEN GROVE CHANNEL	L	R.C.B.	35' on East side & 25' on West side	33	1,980	$203	$399,200	Triple 10' x 10' R.C.B. culvert lengthening
_017.80	55 0462	WESTMINSTER CHANNEL	See Note 3	N/A	N/A	N/A	N/A	N/A	N/A	See Note 3
_019.45	55 0461	ANAHEIM-BARBER CITY CHANNEL	See Note 3	N/A	N/A	N/A	N/A	N/A	N/A	See Note 3
_020.77	55 0334	BOLSA CHICA DITCH	See Note 3	N/A	N/A	N/A	N/A	N/A	N/A	See Note 3
_024.10	55 0441	LOS ALAMTOS CHANNEL	See Note 4	N/A	N/A	N/A	N/A	N/A	N/A	See Note 4

Sub-Total = $1,548,596 Alternative 1

25% Contingency = $387,149 Alternative 1

TOTAL CULVERT COST = $1,940,000 Alternative 1
(see Note 1)

LEGEND

R.C.B. = Reinforced Concrete Box

L = Lengthening Box Culvert

* Alternative 2 cost is based on 23% more culvert lengthening

Sub-Total = $1,904,773 Alternative 2

25% Contingency = $476,193 Alternative 2

TOTAL CULVERT COST = $2,381,000 Alternative 2
(see Note 1)

NOTES

Note 1 : Only culverts are reflected in this list. Bridges, retaining walls, sound walls, approach work, etc. costs are covered in separate lists.

Note 2 : Culvert quantities were obtained from 2006 Standard Plans D80 & D81 and unit prices were based on Caltrans 2006 Cost Index.

Note 3 : No construction is required because proposed widening is within existing culvert length

Note 4 : Based on SR-22 WCC (EA 071621 & EA 071631) Project Report no construction is required because proposed widening is within existing culvert length.

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I-405 PSR/PDS WALL DESIGN (Alternative 1 & 2*)

[Retaining Walls, Sound Walls, Tieback Walls, Crash Walls, MSE Walls]

Postmile	Location (Note 3)	Assumed Type of Wall	Estimated Length (ft)	Estimated Average Height of Wall (ft)	Wall Area (ft^2)	$/Square Feet	Existing Wall Demolition Cost	Estimated Wall Cost (Note 1 & Note 2)
_012.41 to _013.15	SANTA ANA RIVER to WARD STREET OC	Type 1	5,615	7	41,776	$60	N/A	$2,506,536
		Soundwall (Masonry Block) on Barrier	1,310	14	18,340	$45	$110,040	$1,159,350
		Soundwall (Masonry Block) on Type 1 Wall	1,110	14	15,540	$45	$93,240	$1,230,990
_013.15 to _013.41	WARD STREET OC to TALBERT AVENUE OC	Soundwall (Masonry Block) on Type 1 Wall	1,175	14	16,450	$45	$98,700	$1,303,075
_013.41 to _013.78	TALBERT AVENUE OC to BROOKHURST STREET OC	Type 1	725	6	4,176	$60	N/A	$250,560
		Soundwall (Masonry Block) on Barrier	1,700	14	23,800	$45	$142,800	$1,504,500
_013.78 to _014.13	BROOKHURST STREET OC to SLATER AVENUE OC	Soundwall (Masonry Block) on Barrier	1,350	14	18,900	$45	$113,400	$1,194,750
_014.13 to _014.50	SLATER AVENUE OC to BUSHARD STREET OC	Soundwall (Masonry Block) on Barrier	2,275	14	31,850	$45	$191,100	$2,013,375
		Soundwall (Masonry Block) on Type 1 Wall	1,150	14	16,100	$45	$96,600	$1,275,350
_014.50 to _014.82	BUSHARD STREET OC to WARNER AVENUE OC	Type 1	470	4	2,068	$60	N/A	$124,080
		Soundwall (Masonry Block) on Barrier	250	14	3,500	$45	$21,000	$221,250
_014.82 to _015.21	WARNER AVE OC to MAGNOLIA STREET OC	Type 1	835	6	4,826	$60	N/A	$289,578
		MSE	3,835	15	55,838	$75	N/A	$4,187,820
		Soundwall (Masonry Block) on Barrier	320	14	4,480	$45	$26,880	$283,200
		Soundwall (Masonry Block) on Type 1 Wall	800	14	11,200	$45	$67,200	$887,200
_015.21 to _015.90	MAGNOLIA STREET OC to NEWLAND STREET OC	Type 1	350	6	2,023	$60	N/A	$121,380
		Soundwall (Masonry Block) on Barrier	1,840	14	25,760	$45	$154,560	$1,628,400
		Soundwall (Masonry Block) on Type 1 Wall	2,575	14	36,050	$45	$216,300	$2,855,675
_015.90 to _016.28	NEWLAND STREET OC to EDINGER AVENUE OC	Type 1	2,725	6	16,105	$60	N/A	$966,285
_016.28 to _016.52	EDINGER AVENUE OC to ROUTE 405/39 SEP	Type 1	850	6	4,947	$60	N/A	$296,820
_016.52 to _016.98	ROUTE 405/39 SEP to McFADDEN AVENUE OC	Type 1	1,870	5	9,163	$60	N/A	$549,780
		Tieback	610	16	9,760	$165	N/A	$1,610,400
		MSE	825	17	13,778	$75	N/A	$1,033,313
		Soundwall (Masonry Block) on Type 1 Wall	1,100	14	15,400	$45	$92,400	$1,219,900
		Soundwall (Masonry Block) on Barrier	340	14	4,760	$45	$28,560	$300,900
_016.98 to _017.75	McFADDEN AVENUE OC to BOLSA AVENUE	Type 1	3,455	10	33,693	$60	N/A	$2,021,590
		Crash Wall	316	20	6,320	$226	N/A	$1,428,320
		Soundwall (Masonry Block) on Type 1 Wall	2,855	14	39,970	$45	$239,820	$3,166,195
		Soundwall (Masonry Block) on Barrier	1,785	14	24,990	$45	$149,940	$1,579,725
_017.75 to _017.94	BOLSA AVENUE to GOLDENWEST STREET OC	Type 1	2,430	6	14,143	$60	N/A	$848,556
_017.94 to _018.60	GOLDENWEST STREET OC to EDWARDS STREET OC	Type 1	4,940	8	37,544	$60	N/A	$2,252,640
		Crash Wall	316	20	6,320	$226	N/A	$1,428,320
		Soundwall (Masonry Block) on Barrier	172	14	2,408	$45	$14,448	$152,220
_018.60 to _019.16	EDWARDS STREET OC to WESTMINSTER AVENUE OC	Type 1	2,185	7	16,016	$60	N/A	$960,963
		Soundwall (Masonry Block) on Type 1 Wall	1,210	14	16,940	$45	$101,640	$1,341,890
		Soundwall (Masonry Block) on Barrier	990	14	13,860	$45	$83,160	$876,150
_019.16 to _019.38	WESTMINSTER AVENUE OC to SPRINGDALE STREET OC	Type 1	2,625	10	26,434	$60	N/A	$1,586,025
		Soundwall (Masonry Block) on Barrier	415	14	5,810	$45	$34,860	$367,275
_019.38 to _020.56	SPRINGDALE STREET OC to BOLSA CHICA ROAD OC	Type 1	1,930	7	13,278	$60	N/A	$796,704
		Soundwall (Masonry Block) on Barrier	10,835	14	151,690	$45	$910,140	$9,588,975
_020.56 to _022.64	BOLSA CHICA ROAD OC to SEAL BEACH BLVD OC	Soundwall (Masonry Block) on Barrier	5,850	14	81,900	$45	$491,400	$5,177,250
_022.64 to _024.11	SEAL BEACH BLVD OC to S405-N605 CONNECTOR OC	Soundwall (Masonry Block) on Barrier	2,930	14	41,020	$45	$246,120	$2,593,050

NOTES

Note 1: Only soundwall, retaining wall, tieback wall, and crash wall costs are reflected in this list. Bridge costs, roadway approach work, culvert, etc. costs are covered in separate lists.

Note 2: Cost for soundwalls located atop of concrete barriers include the cost for an assumed 3 foot high concrete barrier with 16" diameter Cast-In-Drilled-Hole concrete piles spaced at 10 feet on center. Cost for soundwalls located atop of Type 1 retaining walls include the cost for an assumed 6 foot high retaining wall.

Note 3: Retaining walls located between any two bridges include retaining walls required along I-405 right-of-way and also include retaining walls required at bridge approaches, if any.

Alternative 1

Sub-Total =	$65,180,314
25% Contingency =	$16,295,079
TOTAL WALL COST =	**$82,000,000**
(See Note 1)	

Alternative 2

*Alternative 2 is estimated 3% greater than Alternative 1

Sub-Total =	$67,135,724
25% Contingency =	$16,783,931
TOTAL WALL COST =	**$84,000,000**
(See Note 1)	

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I-405 PSR/PDS BRIDGE INFORMATION (Alternative 1)

Postmile	Bridge Number	Bridge Name	Type of Construction	Structure Type Assumed (Note 2)	Length of Widening or Estimated Length of New Bridge (ft)	Width of New Bridge or Widening (ft)	Deck Area (ft^2)	$/Square Feet (Note 3)	Estimated Bridge Cost	Existing Bridge Demolition Cost	Asbestos Removal Cost	Total Bridge Cost (Note 1)	Remarks
_012.41	55 0258	SANTA ANA RIVER	W	CIP/PS Box	440	21' on North Side & 21' and varies on South Side	18,900	$230	$4,347,000	$44,013	$12,000	$4,403,013	6-span bridge
_012.xx	55 xxxx	EUCLID ST ON-RAMP CONNECTOR	N	CIP/PS Box	345	33' & varies	12,593	$230	$2,896,390	N/A	N/A	$2,896,390	3-span bridge
_013.15	55 0429	WARD STREET OC	R	CIP/PS Box	316	73	23,068	$230	$5,305,640	$186,665	$12,000	$5,504,305	2-span bridge
_013.41	55 0260	TALBERT AVENUE OC	R	CIP/PS Box	495	105	51,975	$230	$11,954,250	$513,620	$12,000	$12,479,870	2-span bridge
_013.78	55 0402	BROOKHURST STREET OC	R	CIP/PS Box	484	130' & varies	62,920	$230	$14,471,600	$1,072,800	$12,000	$15,556,400	4-span bridge
_014.13	55 0261	SLATER AVENUE OC	R	CIP/PS Box	400	73	29,200	$230	$6,716,000	$404,800	$12,000	$7,132,800	2-span bridge
_014.50	55 0262	BUSHARD STREET OC	R	CIP/PS Box	400	73	29,200	$230	$6,716,000	$369,660	$12,000	$7,097,660	2-span bridge
_014.82	55 0263	WARNER AVENUE OC	R	CIP/PS Box	520	130	67,600	$230	$15,548,000	$937,573	$12,000	$16,497,573	4-span bridge
_014.xx	55 xxxx	WARNER AVE ON-RAMP CONNECTOR OC	N	CIP/PS Box	285	28' & varies	9,263	$230	$2,130,490	N/A	N/A	$2,130,490	3-span bridge, structure is assumed to sit on high seat abutments
_015.xx	55 xxxx	MAGNOLIA ST ON-RAMP CONNECTOR OC	N	CIP/PS Box	440	40	17,600	$230	$4,048,000	N/A	N/A	$4,048,000	3-span bridge, structure is assumed to sit on high seat abutments
_015.21	55 0264	MAGNOLIA STREET OC	R	CIP/PS Box	549	98	53,802	$230	$12,374,460	$524,600	$12,000	$12,911,060	4-span bridge
_015.48	55 0407	HEIL AVENUE POC	R	CIP/PS Box	707	9.5	6,717	$190	$1,276,230	$116,660	$12,000	$1,404,890	7 span pedestrian bridge, bridge width is assumed to be the same as existing
_015.90	55 0265	NEWLAND STREET OC	R	CIP/PS Box	368	78	28,704	$230	$6,601,920	$207,940	$12,000	$6,821,860	2-span bridge, Outrigger bent maybe required in order to clear existing East Garden Grove Channel
_016.28	55 0266	EDINGER AVENUE OC	R	CIP/PS Box	430	89	38,270	$230	$8,802,100	$515,206	$12,000	$9,329,306	2-span bridge
_016.52	55 0267	ROUTE 405/39 SEPARATION	W	PC/PS I	268	11.5' and varies on North Side & 10' and varies on South Side	6,828	$260	$1,775,280	$26,775	$12,000	$1,814,055	4-span bridge, tie-back walls required
_016.xx	55 xxxx	ROUTE 39 - N405 ON-RAMP CONNECTOR	N	CIP/PS Box	311.25	40	12,450	$230	$2,863,500	N/A	N/A	$2,863,500	4-span bridge
_016.xx	55 xxxx	ROUTE 39/405 NB ON-RAMP CONNECTOR OC	N	CIP/PS Box	175	35' & varies	6,650	$230	$1,529,500	N/A	N/A	$1,529,500	Single span bridge
_016.xx	55 xxxx	ROUTE 39 -S405 ON-RAMP CONNECTOR	N	CIP/PS Box	334	41' & varies	14,195	$230	$3,264,850	N/A	N/A	$3,264,850	2-span bridge
_016.xx	55 xxxx	ROUTE 39/405 SB ON-RAMP CONNECTOR OC	N	CIP/PS Box	160	42	6,720	$230	$1,545,600	N/A	N/A	$1,545,600	Single span bridge
_016.98	55 0268	MCFADDEN AVENUE OC	R	CIP/PS Box	431	84	36,204	$230	$8,326,920	$289,368	$12,000	$8,628,288	2-span bridge
_017.21	55 0269	BOLSA OVERHEAD	W	PC/PS I	177.5	40' on North Side & 26' on South Side	11,715	$260	$3,045,900	$17,750	$12,000	$3,075,650	3 span bridge widening, crash walls required on both sides of rail track
_017.75	55 0270	BOLSA AVENUE OC	R	CIP/PS Box	464	150' & varies	69,600	$230	$16,008,000	$700,280	$12,000	$16,720,280	4-span bridge
_017.94	55 0271	GOLDEN WEST STREET OC	R	CIP/PS Box	460	148	68,080	$230	$15,658,400	$678,272	$12,000	$16,348,672	4-span bridge

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I-405 PSR/PDS BRIDGE INFORMATION (Alternative 1)

Postmile	Bridge Number	Bridge Name	Type of Construction	Structure Type Assumed (Note 2)	Length of Widening or Estimated Length of New Bridge (ft)	Width of New Bridge or Widening (ft)	Deck Area (ft^2)	$/Square Feet (Note 3)	Estimated Bridge Cost	Existing Bridge Demolition Cost	Asbestos Removal Cost	Total Bridge Cost (Note 1)	Remarks
_018.36	55 0272	NAVY OVERHEAD	W	PC/PS I	172	35' on East Side & 35' on West Side	12,059	$260	$3,135,340	$17,230	$12,000	$3,164,570	3-span bridge widening, crash walls required on both sides of rail track
_018.60	55 0273	EDWARDS STREET OC	R	CIP/PS Box	388	84	32,592	$230	$7,496,160	$430,848	$12,000	$7,939,008	2-span bridge
_019.16	55 0274	WESTMINSTER AVENUE OC	R	CIP/PS Box	463	133	61,579	$230	$14,163,170	$832,840	$12,000	$15,008,010	4-span bridge
_019.38	55 0275	SPRINGDALE STREET OC	R	CIP/PS Box	388	85' & varies	32,980	$230	$7,585,400	$463,410	$12,000	$8,060,810	2-span bridge
_020.56	55 0276	BOLSA CHICA ROAD OC	R	CIP/PS Box	308	145	44,660	$230	$10,271,800	$443,700	$12,000	$10,727,500	2-span bridge
_020.xx	55 331R	ROUTE 22/405 SEPARATION											(See Note 4)
_020.xx	55 xxxx	I-405/SR 22 HOV CONNECTOR											(See Note 4)
_020.75	55 0331F	S405-E22 CONNECTOR OC											(See Note 4)
_020.75	55 0331F	S405-E22 CONNECTOR OC											(See Note 4)
_022.64	55 0365	SEAL BEACH BLVD OC											(See Note 4)
_023.28	55 0333G	N405-W22 CONNECTOR OC											(See Note 4)
_023.28	55 0333G	N405-W22 CONNECTOR OC											(See Note 4)
_023.98	55 0412G	E22-N405/405 CONNECTOR SEPARATION											(See Note 4)
_024.02	55 0412R	605/405 SEPARATION											(See Note 4)
_024.04	55 0412L	605/405 SEPARATION											(See Note 4)
_024.11	55 0413F	S405-N605 CONNECTOR OC											(See Note 4)
_024.11	55 0413F	S405-N605 CONNECTOR OC											(See Note 4)
											Sub-Total =	$208,903,910	
											25% Contingency =	$52,225,978	
											TOTAL PROJECT BRIDGE COST =	**$262,000,000**	
											(See Note 1 & 4)		

LEGEND

CIP/PS Box = Cast-In-Place/ Pre-Stressed Box Girder
N = New Bridge Structure
N/A = Not Applicable
PC/PS I = Pre-Cast/ Pre-Stressed I Girder
R = Replacement
W = Widening

NOTES

Note 1: Only bridge costs are reflected in this list. Retaining walls, sound walls, roadway approach work, etc. costs are covered in separate lists.

Note 2: Assume roadway profile permits bridge construction with falsework for Cast-In-Place/Pre-Stressed Concrete Box Girder bridges.

Note 3: $/$Ft^2$ costs are based on "Caltrans Comparative Bridge Costs (January 2007)" which excludes roadway approach work costs.

Note 4: Bridge improvements north of Bolsa Chica Road OC will be accounted for by West County Connector Project which anticipates to accommodate proposed I-405 roadway work.

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I-405 PSR/PDS BRIDGE INFORMATION (Alternative 2)

Postmile	Bridge Number	Bridge Name	Type of Construction	Structure Type Assumed (Note 2)	Length of Widening or Estimated Length of New Bridge (ft)	Width of New Bridge or Widening (ft)	Deck Area (ft^2)	$/Square Feet (Note 3)	Estimated Bridge Cost	Existing Bridge Demolition Cost	Asbestos Removal Cost	Total Bridge Cost (Note 1)	Remarks
_012.41	55 0258	SANTA ANA RIVER	W	CIP/PS Box	484	12' on North Side & 16' and varies on South Side	15,159	$230	$3,486,460	$44,013	$12,000	$3,542,473	6-span bridge
_012.xx	55 xxxx	EUCLID ST ON-RAMP CONNECTOR	N	CIP/PS Box	379.5	33' & varies	15,489	$230	$3,562,560	N/A	N/A	$3,562,560	3-span bridge
_013.15	55 0429	WARD STREET OC	R	CIP/PS Box	355.3	73	25,937	$230	$5,965,487	$186,665	$12,000	$6,164,152	2-span bridge
_013.41	55 0260	TALBERT AVENUE OC	R	CIP/PS Box	566.5	105	59,483	$230	$13,680,975	$513,620	$12,000	$14,206,595	2-span bridge
_013.78	55 0402	BROOKHURST STREET OC	R	CIP/PS Box	539	130' & varies	78,351	$230	$18,020,730	$1,072,800	$12,000	$19,105,530	4-span bridge
_014.13	55 0261	SLATER AVENUE OC	R	CIP/PS Box	453.2	73	33,084	$230	$7,609,228	$404,800	$12,000	$8,026,028	2-span bridge
_014.50	55 0262	BUSHARD STREET OC	R	CIP/PS Box	453.2	73	40,693	$230	$9,359,350	$369,660	$12,000	$9,741,010	2-span bridge
_014.82	55 0263	WARNER AVENUE OC	R	CIP/PS Box	572	130	74,360	$230	$17,102,800	$937,573	$12,000	$18,052,373	4-span bridge
_014.xx	55 xxxx	WARNER AVE ON-RAMP CONNECTOR OC	N	CIP/PS Box	313.5	28' & varies	11,393	$230	$2,620,503	N/A	N/A	$2,620,503	3-span bridge, structure is assumed to sit on high seat abutments
_015.xx	55 xxxx	MAGNOLIA ST ON-RAMP CONNECTOR OC	N	CIP/PS Box	484	40	19,360	$230	$4,452,800	N/A	N/A	$4,452,800	3-span bridge, structure is assumed to sit on high seat abutments
_015.21	55 0264	MAGNOLIA STREET OC	R	CIP/PS Box	616	98	60,368	$230	$13,884,640	$524,600	$12,000	$14,421,240	4-span bridge
_015.48	55 0407	HEIL AVENUE POC	R	CIP/PS Box	777.7	9.5	7,388	$190	$1,403,749	$116,660	$12,000	$1,532,409	7 span pedestrian bridge, bridge width is assumed to be the same as existing
_015.90	55 0265	NEWLAND STREET OC	R	CIP/PS Box	414.7	73	30,273	$230	$6,962,813	$207,940	$12,000	$7,182,753	2-span bridge, Outrigger bent maybe required in order to clear existing East Garden Grove Channel
_016.28	55 0266	EDINGER AVENUE OC	R	CIP/PS Box	487.3	88	42,882	$230	$9,862,952	$515,206	$12,000	$10,390,158	2-span bridge
_016.52	55 0267	ROUTE 405/39 SEPARATION	W	PC/PS I	294.8	11.5' and varies on North Side & 10' and varies on South Side	8,398	$260	$2,183,594	$26,775	$12,000	$2,222,369	4-span bridge, tie-back walls required
_016.xx	55 xxxx	ROUTE 39 - N405 ON-RAMP CONNECTOR	N	CIP/PS Box	342.375	40	13,695	$230	$3,149,850	N/A	N/A	$3,149,850	4-span bridge
_016.xx	55 xxxx	ROUTE 39/405 NB ON-RAMP CONNECTOR OC	N	CIP/PS Box	192.5	35' & varies	8,180	$230	$1,881,285	N/A	N/A	$1,881,285	Single span bridge
_016.xx	55 xxxx	ROUTE 39 -S405 ON-RAMP CONNECTOR	N	CIP/PS Box	367.4	41' & varies	17,460	$230	$4,015,766	N/A	N/A	$4,015,766	2-span bridge
_016.xx	55 xxxx	ROUTE 39/405 SB ON-RAMP CONNECTOR OC	N	CIP/PS Box	176	42	7,392	$230	$1,700,160	N/A	N/A	$1,700,160	Single span bridge
_016.98	55 0268	MCFADDEN AVENUE OC	R	CIP/PS Box	506	80	40,480	$230	$9,310,400	$289,368	$12,000	$9,611,768	2-span bridge
_017.21	55 0269	BOLSA OVERHEAD	W	PC/PS I	195.8	50' on North Side & 35' on South Side	18,558	$260	$5,916,550	$17,750	$12,000	$5,946,300	3 span bridge widening, crash walls required on both sides of rail track
_017.75	55 0270	BOLSA AVENUE OC	R	CIP/PS Box	533.5	150' & varies	89,483	$230	$20,580,975	$700,280	$12,000	$21,293,255	4-span bridge
_017.94	55 0271	GOLDEN WEST STREET OC	R	CIP/PS Box	555.5	145	80,548	$230	$18,525,925	$678,272	$12,000	$19,216,197	4-span bridge

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I-405 PSR/PDS BRIDGE INFORMATION (Alternative 2)

Postmile	Bridge Number	Bridge Name	Type of Construction	Structure Type Assumed (Note 2)	Length of Widening or Estimated Length of New Bridge (ft)	Width of New Bridge or Widening (ft)	Deck Area (ft^2)	$/Square Feet (Note 3)	Estimated Bridge Cost	Existing Bridge Demolition Cost	Asbestos Removal Cost	Total Bridge Cost (Note 1)	Remarks
_018.36	55 0272	NAVY OVERHEAD	W	PC/PS I	189.2	37' on East Side & 37' on West Side	15,680	$260	$5,104,159	$17,230	$12,000	$5,133,389	3-span bridge widening, crash walls required on both sides of rail track
_018.60	55 0273	EDWARDS STREET OC	R	CIP/PS Box	423.5	80	33,880	$230	$7,792,400	$430,848	$12,000	$8,235,248	2-span bridge
_019.16	55 0274	WESTMINSTER AVENUE OC	R	CIP/PS Box	528	133	70,224	$230	$16,151,520	$832,840	$12,000	$16,996,360	4-span bridge
_019.38	55 0275	SPRINGDALE STREET OC	R	CIP/PS Box	437.8	85' & varies	41,611	$230	$9,570,507	$463,410	$12,000	$10,045,917	2-span bridge
_020.56	55 0276	BOLSA CHICA ROAD OC	R	CIP/PS Box	330	145	47,850	$230	$11,005,500	$443,700	$12,000	$11,461,200	2-span bridge
_020.xx	55 331R	ROUTE 22/405 SEPARTION	R	CIP/PS Box	957	55	52,635	$230	$12,106,050	$1,026,600	N/A	$13,132,650	5-span bridge, 2 Outrigger Bents assumed
_020.xx	55 xxxx	I-405/SR 22 HOV CONNECTOR	R	CIP/PS Box	1254	55	68,970	$230	$15,863,100	$961,700	N/A	$16,824,800	5-span bridge, 4 Outrigger Bents assumed
_020.75	55 0331F	S405-E22 CONNECTOR OC											(See Note 4)
_020.75	55 0331F	S405-E22 CONNECTOR OC											(See Note 4)
_022.64	55 0365	SEAL BEACH BLVD OC											(See Note 4)
_023.28	55 0333G	N405-W22 CONNECTOR OC											(See Note 4)
_023.28	55 0333G	N405-W22 CONNECTOR OC											(See Note 4)
_023.98	55 0412G	E22-N405/405 CONNECTOR SEPARATION											(See Note 4)
_024.02	55 0412R	605/405 SEPARATION											(See Note 4)
_024.04	55 0412L	605/405 SEPARATION											(See Note 4)
_024.11	55 0413F	S405-N605 CONNECTOR OC											(See Note 4)
_024.11	55 0413F	S405-N605 CONNECTOR OC											(See Note 4)

	Sub-Total =	$273,867,098
	25% Contingency =	$68,466,774
TOTAL BRIDGE COST = (See Note 1)		**$343,000,000**

LEGEND

CIP/PS Box = Cast-In-Place/ Pre-Stressed Box Girder
PC/PS I = Pre-Cast/ Pre-Stressed I Girder
R = Replacement
W = Widening

NOTES

Note 1: Only bridge costs are reflected in this list. Retaining walls, sound walls, roadway approach work, etc. costs are covered in separate lists.

Note 2: Assume roadway profile permits bridge construction with falsework for Cast-In-Place/Pre-Stressed Concrete Box Girder bridges.

Note 3: $/$Ft^2$ costs are based on "Caltrans Comparative Bridge Costs (January 2007)" which excludes roadway approach work costs.

Note 4: Bridge improvements north of Bolsa Chica Road OC will be accounted for by West County Connector Project which anticipates to accommodate proposed I-405 roadway work.

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ATTACHMENT 7

STORM WATER DATA REPORT

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Dist-County-Route: 12-ORA-405

Post Mile (Kilometer Post) Limits: PM 10.3/24.1

Project Type: Highway Widening

EA: 0H100K

RU: 12/840

Program Identification: 20.10.201.310

Phase: ☒**PID** ☐**PA/ED** ☐**PS&E**

Regional Water Quality Control Board(s): Santa Ana Regional Water Quality Control Board (Region 8)

Is the project required to consider incorporating Treatment BMPs? ☒Yes ☐No

If yes, can Treatment BMPs be incorporated into the project? ☒Yes ☐No

If No, a Technical Data Report must be submitted to the RWQCB at least 60 days prior to PS&E Submittal. List submittal date: _____

Total Disturbed Soil Area: 290 acres

Estimated Construction Start Date: June 2014 Construction Completion Date: June 2019

Notification of Construction (NOC) Date to be submitted: March 2014

Notification of ADL reuse (if Yes, provide date) ☐Yes Date: To be determined ☐No

Separate Dewatering Permit (if Yes, permit number) ☒Yes Permit #: Order # R8-2003-0061 ☐No

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the data upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Richard S. Bottcher 6/15/08

Richard Bottcher, *Registered Project Engineer* Date

I have reviewed the storm water quality design issues and find this report to be complete, current, and accurate:

6/24/08

Vinh Pham, *Project Manager* Date

Carol Lonebear 6/25/08

Carol Lonebear, *Designated Maintenance Representative* Date

For 6/25/08

Sandy Ankhasirisan, *Designated Landscape Architect Representative* Date

6/23/08

Grace Piña-Garrett, *District/Regional SW Coordinator or Designee* Date

STORM WATER DATA INFORMATION

1. Project Description

- Two build alternatives are being considered for the proposed project. Build Alternative 1 would add a single general purpose freeway lane in each direction of I-405 from Euclid Street to the I-605 interchange. In the northbound direction, additional auxiliary lanes would be provided between ramps at the following locations:
    - from the southbound Harbor Boulevard/Hyland Street/westbound South Coast Drive on-ramp to the Euclid Avenue/Ellis Street off-ramp;
    - from the northbound Brookhurst Street on-ramp to the Warner Avenue off-ramp;
    - from the Beach Boulevard on-ramp to the Bolsa Avenue off-ramp;
    - from the Goldenwest Street on-ramp to the Westminster Avenue off-ramp;
    - from the Westminster Avenue on-ramp to the Valley View Street/Bolsa Chica Road/Garden Grove Boulevard/SR-22 eastbound off-ramp; and
    - from the Seal Beach Boulevard on-ramp to the SR-22 Westbound/7th Street off-ramp.

  In the southbound direction, additional auxiliary lanes would be provided between ramps at the following locations:

    - from the Bolsa Chica Road/Valley View Street on-ramp to the Springdale Street off-ramp;
    - from the Westminster Avenue on-ramp to the Goldenwest Street/Bolsa Avenue C-D road off-ramp;
    - from the Goldenwest Street/Bolsa Avenue C-D road on-ramp to the Beach Boulevard/Center Avenue off-ramp;
    - from the Magnolia Street on-ramp to the Brookhurst Street off-ramp; and
    - from the southbound Euclid Street on-ramp to the Harbor Boulevard off-ramp, the southern portion of which currently exists.

  Build Alternative 1 would include shoulders on the left and right sides in both directions. South of the Westminster Avenue interchange, the inside shoulder would be a 14-foot-wide continuous HOV enforcement shoulder, except for some narrowing to 10 feet near the Beach Boulevard and Goldenwest Street/Bolsa Avenue interchanges and at overcrossing column and overhead sign post locations. North of Westminster Avenue, the inside shoulder would be 10 feet wide. Build Alternative 1 would not include a buffer between the HOV and general purpose lanes. On July 31, 2007, the Department of Transportation approved a Project Study Report (EA 0J440K) to eliminate the existing HOV buffer on the entire length of I-405 in Orange County and provide continuous ingress and egress from the HOV lanes; the project has not been programmed or funded. Build Alternative 1 is designed based on the assumption that the ongoing SR-22 project improvements will include the acquisition of 20 feet of additional ROW on the south side of the freeway between Bolsa Chica Road and Seal Beach Boulevard, as cleared in the SR-22 environmental document.

  Interchange improvements at each interchange within the project limits are proposed in Build Alternative 1. Some interchanges have two options for improvements, which will be more fully investigated during the Project Approval/Environmental Document (PA/ED) phase of project development. Generally, each interchange would have the following improvements:

    - left- and right-side shoulders on on-/off-ramps;
    - increased on-ramp storage capacity for ramp meters;

- removal of HOV bypass lanes from on-ramps, subject to individual analysis of each on-ramp during the PA/ED phase and approval by FHWA;
- increased off-ramp storage capacity at local street intersections;
- additional through and turn lanes at intersections of ramps and local streets; and
- reconfiguration to conventional right-turn lanes of continuous right-turn lanes at the intersections of ramps and local streets. This may be revisited during the PA/ED phase on a case-by-case basis.

Additionally, Build Alternative 1 would include the following interchange improvements:

- a new on-ramp from eastbound Ellis Avenue to southbound I-405;
- reconfiguration of the Brookhurst Street interchange;
- braided ramps in both directions at Magnolia Street/Warner Avenue;
- braided ramps in both directions at Beach Boulevard; and
- reconfiguration of the existing northbound off-ramp to eastbound Westminster Avenue.

Build Alternative 2 would add one general purpose lane in each direction as in Build Alternative 1, plus a second lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street. Other features of Build Alternative 2 are similar to Build Alternative 1, except as noted below. Build Alternative 2 would have the same auxiliary lanes as Build Alternative 1 plus an auxiliary lane from the Euclid Street/Ellis Avenue on-ramp to the Brookhurst Street off-ramp in the northbound direction. Build Alternative 2 would not have a northbound auxiliary lane from the Seal Beach Boulevard on-ramp to the SR-22 Westbound/7th Street off-ramp. In the southbound direction, Build Alternative 2 would have the same auxiliary lanes as Build Alternative 1 plus an auxiliary lane from the Talbert Avenue on-ramp to the Euclid Street/Ellis Avenue off-ramp.

- The total Disturbed Soil Area (DSA) for this project (based on the potentially preferred alternative) is estimated to be 290 acres. DSA was calculated based on the extent of the grading involved, the number of retaining walls to be constructed, and the necessary staging area.
- Within the project limits, the existing paved surface area is estimated to be 293 acres. The proposed project is expected to add an additional 111 acres.
- Within the project limits, Orange County and the Incorporated Cities within, are identified as an urban MS4 area under Order No. R8-2002-0010, NPDES No. CAS618030.

2. Define Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

- The Santa Ana Regional Water Quality Control Board (Region 8) has jurisdiction within the project limits.
- The proposed project is approximately 12.3 miles in length, and this portion of Interstate 405 resides in the East Coastal Plain Hydrologic Sub-Area (801.11) and the Anaheim Hydrologic Sub-Area (845.61). Within these Hydrologic Sub-Areas, the project traverses three watersheds, which are the Santa Ana River Watershed, Talbert Watershed, and Westminster Watershed. Within these watersheds, the project crosses eight water bodies, which are the Santa Ana River, East Fountain Valley Channel, Ocean View Channel, Heil Avenue Storm Drain, East Garden Grove-Wintersburg Channel, Westminster Channel, Anaheim-Barber City Channel, and Bolsa Chica Channel. Within the project limits, none of the above mentioned water bodies are on the 303 (d) list. It should be noted that Bolsa Chica Channel is tributary to Bolsa Chica State Beach, which is 303 (d) listed.
- Although the project crosses eight water bodies, there are additional water bodies that are in close proximity to the project limits. These water bodies include Gisler Channel, Greenville Banning Channel,

Bixby Storm Channel, Montecito Storm Channel, Federal Storm Channel, Kempton Storm Channel, Los Alamitos Channel, and the San Gabriel River.

- Within Hydrologic Sub-Areas 801.11 and 845.61, twenty three TMDLs have been established, however none of the receiving waters for the proposed project have established TMDLs.
- A Section 401 Water Quality Certification is required for this project. Additionally, a Section 404 United States Army Corps of Engineers Permit, and a California Department of Fish and Game 1601 Streambed Alteration Agreement will also be required.
- The climate in the project area is classified as Mediterranean, characterized by warm, dry summers and mild, wet winters. The major contributors to the climate are the Eastern Pacific High and the moderating effects of the Pacific Ocean. The mean high winter temperature is 65°F, and the mean high summer temperature is 77°F. The current rainy season in the project area, as defined by the Santa Ana Regional Water Quality Control Board (RWQCB), is from October 1st through May 1st. However, most rainfall occurs during the winter season, December through February. The annual average rainfall within Hydrologic Sub-Areas 801.11 and 845.61 is approximately 13 inches.
- According to the Orange County Hydrology Manual (1986), soils within the project limits are identified as Hydrologic Soils Groups A, B, and C. Hydrologic Soils Groups A and B are suitable for Infiltration Trenches while Hydrologic Soils Groups A, B, and C are suitable for Infiltration Basins. Typically, soils classified into Hydrologic Soils Groups A, B, and C have minimum infiltration rates of 0.5 in/hr and maximum infiltration rates of 2.5 in/hr. Hydrologic Soils Groups A, B, and C are typically classified as sand, loam, silt loam, and sandy clay loam.
- Several measures will be taken in order to avoid or reduce potential storm water impacts. As described in the Caltrans Storm Water Management Plan (SWMP), Best Management Practices (BMPs) will be designed and implemented to reduce the discharge of pollutants from the Caltrans storm drain system to the Maximum Extent Practicable (MEP). Permanent Treatment BMPs proposed for this project include Biofiltration Strips/Swales, Detention Devices, Infiltration Devices, and Media Filters. Erosion control measures also will be used to address site soil stabilization and reduce deposition of sediments in adjacent surface waters. Typical measures will include the application of soil stabilizers such as hydroseeding, rock slope protection, velocity dissipation devices, flared end sections for culverts, and others. A plant list for the areas in which hydroseeding is proposed will be provided at the PS&E stage.
- There are no Drinking Water Reservoirs and/or Recharge Facilities within the project limits.
- At this phase of the project, it is not known if the project would involve the reuse of soil containing Aerially Deposited Lead (ADL). More details will be provided regarding the handling of ADL contaminated soils at the PA/ED phase.
- At this phase of the project, no Right-of-way costs have been identified for BMPs.
- There are no known existing Treatment BMPs within the project limits.

3. Regional Water Quality Control Board Agreements

- To date, no meetings have been held with the Santa Ana RWQCB to discuss this project and no agreements have been made.

4. Describe Proposed Design Pollution Prevention BMPs to be used on the Project.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

- Within the project limits, the existing paved surface area is measured to be 293 acres. The proposed project would add an additional 111 acres of paved surface area. Therefore, the velocity and volume of downstream flow is expected to increase. The total areas for each of the watersheds that the proposed project traverses are as follows: Santa Ana River Watershed has an area of 2,800 square miles; Talbert Watershed has an area of 21.4 square miles; and Westminster Watershed has an area of 74.1 square miles. The total area of these three watersheds is 2,896 square miles. This project will not discharge to unlined channels. With the implementation of Biofiltration Strips/Swales, Detention Devices, Infiltration

Devices, Media Filters, or any combination thereof, the design of the proposed project is aiming to treat 100% of the onsite runoff Water Quality Volume (WQV). Where appropriate, energy dissipation devices will be utilized. All transitions between culvert outlets, headwalls, wingwalls, and channels will be smoothed to reduce turbulence and scour. Offsite runoff would be handled by allowing flows to pass under or around the proposed facility, and the existing drainage pattern would not be altered. Offsite flows would be managed in a manner which would mimic the existing drainage network, and not inundate the roadway surface or any of the existing drainage system. The proposed project would require coordination with all drainages that would be affected, including those that are locally (City/County) owned. Several of the drainages have been identified as being under the jurisdiction of the Orange County Flood Control District, and coordination with this agency will be required.

- Where possible, the runoff from all bridges will be conveyed to Treatment BMPs. No bridge runoff would be directly discharged into waterways.

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

- The proposed project will modify existing slopes and create new slopes. The preservation of existing vegetation will be maximized to help reduce the amount of clearing and grubbing that will be required on slopes. In an effort to reduce concentrated flows, benches or terraces were provided during original construction on high cut and fill slopes and slopes will be rounded or shaped accordingly. All of the new slopes will be flatter than 2:1 (horizontal : vertical). Disturbed slopes shall be re-vegetated per the Erosion Control Plan (approved by the District Landscape Architect).
- Additional details regarding vegetated surface, hard surfaces, and erosion control will be provided at the PA/ED phase.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

- Since it will be necessary to direct or intercept surface runoff, the proposed project will modify ditches, dikes, berms, or swales. Risks due to erosion or washout will be minimized through the use of erosion control measures such as hydroseeding, ground cover, and mulch. Velocity dissipation devices, flared end outlets, headwalls, transition structures, and splash walls will be incorporated into the design where necessary at culvert inlets and outlets to prevent erosion. Ditches will be modified and box culverts will be extended to help intercept sheet flow where necessary and to convey it to facilities that cross under the roadway.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

- The project design has considered minimizing the foot print and matching the existing grading as close as possible so as to preserve as much of the existing vegetation as possible.

5. Describe Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

- All nine Caltrans approved Permanent Treatment BMPs have been analyzed. Individual narratives outlining the applicability of particular Treatment BMPs are outlined below.
- As stated in Section 2, this project is located within two Hydrologic Sub-Areas, the East Coastal Plain Hydrologic Sub-Area (801.11), and the Anaheim Hydrologic Sub-Area (845.61). Within these two Hydrologic Sub-Areas, the Caltrans Water Quality Planning Tool has identified four Targeted Design Constituents (TDCs) for water bodies that are well outside the project limits, but ultimately receive runoff from the proposed project. The TDCs and their associated water bodies are as follows: Bolsa Chica State Beach, with copper as the TDC; Huntington Harbour with Copper and Lead as the TDCs; and the San Gabriel River Estuary, with Copper as the TDC. Therefore, Copper and Lead are the TDCs identified for this project. Although the project will not be directly discharging to the San Gabriel River Estuary, a portion of the project area drains to Bixby Storm Channel, which eventually leads to the San Gabriel River. From there, water is conveyed to the San Gabriel River Estuary.
- Within the project limits, the existing paved surface area is measured to be 293 acres. The proposed project would add an additional 111 acres of paved surface area. With the implementation of

Biofiltration Strips/Swales, Detention Devices, Infiltration Devices, Media Filters, or any combination thereof, the design of the proposed project is aiming to treat 100% of the onsite runoff Water Quality Volume (WQV). At this preliminary level, Biofiltration Swales are proposed at 20 locations, while Detention Devices, Infiltration Devices, Media Filters, or any combination thereof, are proposed at 14 locations.

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2

- Within the project limits, Biofiltration Swales are proposed at 20 locations, as shown on BMP Layout Sheets 1, 3, 4, 5, 6, 7, 8, 9, and 10. The sizing criteria for bioswales is based on Water Quality Flow (WQF), as identified in the PPDG (Caltrans, 2007). This would be used as the basis for designing the approved filtration-type Treatment BMPs. For the project area, the WQF is calculated using the Rational Method and a precipitation rate of 0.2 inches/hour. This rate is designated in the PPDG (Caltrans, 2007) for Region 8 (Santa Ana Region). Individual tributary areas and flows to each of the proposed biofiltration swales will be provided at the PA/ED phase. However, the estimated total WQF for the entire project is as follows:

Rational Formula, $Q = CiA$

Where C – Runoff Coefficient for Paved Surfaces = 0.95
i – Rainfall intensity for this region (per PPDG) = 0.20 in./hr
A – Area of existing and proposed impervious surface (acres) = 404 acres
Q – Flow (cfs)

Therefore, $Q = 0.95 * (0.20\text{in/hr}) * 404 \text{ acres} = 76.8 \text{ cfs}$

- The vegetated trapezoidal swales will be at a slope of less than 2 percent, with 4:1 to 5:1 side slopes, bottom widths of 8 feet, and lengths will be extended as much as possible to maximize pollutant removal. Swales will be designed to Caltrans standards, which will require water quality flow velocities (equal to the flow generated from the 85th percentile storm) to be low enough to keep Hydraulic Residence Times (HRTs) in the swales greater than 5 minutes, with a Manning's n of 0.25 for mowed grass at flow depths less than 0.5 feet. The swales will be vegetated with native grasses. All of the proposed bioswales will meet Caltrans, Traffic Operations requirements, and the side slopes will be 5:1 or flatter for Clear Recover Zones. The seed mixed selected for the Biofiltration Swales will require concurrence from the District Landscape Architect or Biologist.

Dry Weather Diversion, Checklist T-1, Parts 1 and 3.

- Dry weather flows occur so rarely in the project area, that Dry Weather Flow Diversion BMPs are not considered for this project.

Infiltration Devices – Checklist T-1, Parts 1 and 4

- Within the project limits, there are 14 sites that are proposed to have either Detention Devices, Infiltration Devices, Media Filters, or any combination thereof. These 14 potential Treatment BMP sites can be seen on BMP Layout Sheets 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10. Proposed Infiltration Devices would meet the standard guidelines set forth in the Caltrans Project Planning and Design Guide (PPDG, 2007). Individual tributary areas and WQVs to each of the proposed Infiltration Devices will be provided at the PA/ED phase. However, the estimated total WQV for the entire project is as follows:

WQV = Amount of impervious surface (in acres)* Water Quality Flow Depth (provided by Basin Sizer program, per PPDG) = 0.73inches

Total impervious surface area (existing and proposed) within project limits = 404 acres.

WQV = 404 acres (0.73 in.) = 295 acre-inches * (foot/12 inches) = 24.6 acre-feet

Detention Devices, Checklist T-1, Parts 1 and 5

- Within the project limits, there are 14 sites that are proposed to have either Detention Devices, Infiltration Devices, Media Filters, or any combination thereof. These 14 potential Treatment BMP sites

can be seen on BMP Layout Sheets 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10. Proposed Infiltration Devices would meet the standard guidelines set forth in the Caltrans Project Planning and Design Guide (PPDG, 2007). An access road to the devices will be provided during the PS&E phase of the project.

Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6

- None of the receiving water bodies near the proposed project are on the 303(d) priority list for trash TMDLs. Therefore, the use of GSRDs will not be required.

Traction Sand Traps, Checklist T-1, Parts 1 and 7

- Traction sand is not applied in the project area, so Traction Sand Traps were not considered.

Media Filters, Checklist T-1, Parts 1 and 8

- Within the project limits, there are 14 sites that are proposed to have either Detention Devices, Infiltration Devices, Media Filters, or any combination thereof. These 14 potential Treatment BMP sites can be seen on BMP Layout Sheets 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10. Proposed Media Filters would meet the standard guidelines set forth in the Caltrans Project Planning and Design Guide (PPDG, 2007). An access road to the devices will be provided during the PS&E phase of the project. Since Delaware Sand Filters require a permanent pool of water, and this could create vector control issues, the type of Media Filters proposed for this project are Austin Sand Filters. It is anticipated that a permanent pool of water would not be allowed by the local vector control agency.

Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9

- Multi-Chambered Treatment Trains require a permanent pool of water, and were not proposed within the project area due to vector control concerns, and at several of the potential Treatment BMP locations, there is a lack of a consistent source of water to maintain the permanent pool necessary for such devices.

Wet Basins, Checklist T-1, Parts 1 and 10

- Wet Basins were not proposed within the project area due to vector control concerns. Additionally, at several of the potential Treatment BMP locations, there is a lack of a consistent source of water to maintain the permanent pool necessary for such devices.

6. Describe Proposed Temporary Construction Site BMPs to be used on Project

- Since detailed Construction Site BMPs are not known at this time, a general list of Construction Site BMPs that are expected to be implemented for this project are as follows: SS-1 Scheduling, SS-2 Preservation of Existing Vegetation, SS-4 Hydroseeding, SS-5 Soil Binders, SS-7 Geotextiles, Plastic Covers, Erosion Control Blankets & Mats, SS-9 Earth Dikes/Drainage Swales & Ditches, SS-10 Outlet Protection/Velocity Dissipation Devices, SC-1 Silt Fence, SC-5 Fiber Rolls, SC-6 Gravel Bag Berm, SC-7 Street Sweeping and Vacuuming, SC-8 Sandbag Barrier, SC-10 Storm Drain Inlet Protection, TC-1 Stabilized Construction Entrance/Exit, TC-3 Entrance/Outlet Tire Wash, NS-1 Water Conservation Practices, NS-2 Dewatering Operations, NS-3 Paving and Grinding Operations, NS-6 Illicit Connection/Illegal Discharge Detection and Reporting., NS-12 Concrete Curing, NS-15 Structure Demolition/Removal Over or Adjacent to Water, WM-1 Material Delivery and Storage, WM-2 Material Use, WM-3 Stockpile Management, WM-4 Spill Prevention and Control, WM-5 Solid Waste Management, WM-6 Hazardous Waste Management, WM-7 Contaminated Soil Management, WM-8 Concrete Waste Management, WM-9 Sanitary/Septic Waste Management, WM-10 Liquid Waste Management. Details regarding those Construction Site BMPs to be designated as separate Bid Line Items, or incorporated as a lump sum, will be provided at the PS&E Phase.
- This project would require dewatering, and coverage must be obtained under Order No. R8-2003-0061, *General Waste Discharge Requirements for Discharges to Surface Waters which Pose an Insignificant (De Minimus) Threat to Water Quality*.

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain inlets will be stenciled in areas accessible to pedestrians, in accordance with project plans and specifications. Exact locations will be defined at the PS&E phase.

REQUIRED ATTACHMENTS

- ⇒ **Vicinity Map**
- ⇒ **Evaluation Documentation Form (EDF)**
- ⇒ **Treatment BMP Summary Spreadsheets (required, if Treatment BMPs are incorporated into project)**
- ⇒

SUPPLEMENTAL ATTACHMENTS

Note: Supplement Attachments are to be supplied during the SWDR approval process; where noted, some of these items may only be required on a project-specific basis.

- ⇒ Storm Water BMP Cost Summary
- ⇒ BMP cost information from: Preliminary Project Cost Estimate (PPCE) for PID project phase
- ⇒ Plans showing BMP Deployment (i.e. Layout Sheets, Water Pollution Control Sheets, etc)
- ⇒ Pertinent Correspondence with RWQCB (if requested or recommended by District/Regional NPDES Storm Water Coordinator or Designated Reviewer)
- ⇒ Checklist SW-1, Site Data Sources
- ⇒ Checklist SW-2, Storm Water Quality Issues Summary
- ⇒ Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- ⇒ Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs) [only those parts that are applicable]
- ⇒ Checklists T-1, Parts 1–10 (Treatment BMPs) [only those Parts that are applicable]

DATE: 4/14/08

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPS

EA: 0H100K

NO.	CRITERIA	YES	NO	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	☒		Go to 2
2.	Is this an emergency project?	☐	☒	If **Yes**, go to 11. If **No**, continue to 3.
3.	Have TMDLs OR OTHER Pollution Control Requirements been established for surface waters within the project limits?	☐	☒	If **Yes**, contact the District/Regional NPDES coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 10 or 4 (as determined by the NPDES Coordinator). _____ *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project within an urban MS4?	☒	☐	If **Yes**, continue to 5. **Order No. R8-2002-0010** If **No**, go to 11.
5.	Is the project directly or indirectly discharging to surface waters?	☒	☐	If **Yes**, continue to 6. If **No**, go to 11.
6.	Is this a new facility or major reconstruction?	☒	☐	If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?	☐	☐	If **Yes**, continue to 8. If **No**, go to 11.
8.	Is the Disturbed Soil Area (DSA) created by the project greater than or equal to 3.0 acres or does the project result in a net increase of one acre or more of new impervious surface?	☒	☐	If **Yes**, continue to 10. If **No**, go to 9. _____ *290 acres (Total DSA quantity*
9.	Is the project part of a Common Plan of Development?	☐	☐	If **Yes**, continue to 10. If **No**, go to 11.
10.	Project is required to consider approved Treatment BMPs.	☒	See Sections 2.4 and either Section 5.5 or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
11.	Project is not required to consider Treatment BMPs. _____*(Dist./Reg. SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*	☐	Document for Project Files by completing this form, and attaching it to the SWDR.	

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs

Checklist SW-1, Site Data Sources

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• USGS, Quadrangle Maps	Varies (1984 to 2000)
•	
•	
Hydraulic	
•	
•	
•	
Soils	
• Orange County Environmental Management Agency, *Orange County Hydrology Manual.*	October 1986
•	
•	
Climatic	
• Orange County Environmental Management Agency, *Orange County Hydrology Manual.*	October 1986
•	
•	
Water Quality	
• Santa Ana RWQCB, Water Quality Control Plan for the Santa Ana Basin	1995
•	
•	
Other Data Categories	
• Report of Initial Site Assessment I-405 Freeway Widening, Group Delta Consultants	September 2007
•	
•	
•	
•	

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	☒Complete	☐NA
2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒Complete	☐NA
3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☒Complete	☐NA
4. Determine the RWQCB special requirements, including TMDLs, effluent limits, etc.	☒Complete	☐NA
5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☒Complete	☐NA
6. Determine if a 401 certification will be required.	☒Complete	☐NA
7. List rainy season dates.	☒Complete	☐NA
8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒Complete	☐NA
9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒Complete	☐NA
10. Determine contaminated or hazardous soils within the project area.	☒Complete	☐NA
11. Determine the total disturbed soil area of the project.	☒Complete	☐NA
12. Describe the topography of the project site.	☒Complete	☐NA
13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☒Complete	☐NA
14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☒Complete	☐NA
15. Determine if a right-of-way certification is required.	☒Complete	☐NA
16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.	☐Complete	☒NA
17. Determine if project area has any slope stabilization concerns.	☒Complete	☐NA
18. Describe the local land use within the project area and adjacent areas.	☒Complete	☐NA
19. Evaluate the presence of dry weather flow.	☒Complete	☐NA

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405
PM (KP): PM 10.3/24.1 EA: 0H100K
RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☒No	☐NA
2.	Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☒Yes	☐No	☐NA
3.	Can any of the following methods be utilized to minimize erosion from slopes:			
	a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
	b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
	c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☒Yes	☐No	☐NA
	d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☐Yes	☐No	☒NA
	e. Avoiding soils or formations that will be particularly difficult to re-stabilize?	☐Yes	☐No	☒NA
	f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?	☒Yes	☐No	☐NA
	g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	☒Yes	☐No	☐NA
	h. Rounding and shaping slopes to reduce concentrated flow?	☒Yes	☐No	☐NA
	i. Collecting concentrated flows in stabilized drains and channels?	☒Yes	☐No	☐NA
4.	Does the project design allow for the ease of maintaining all BMPs?	☒Yes	☐No	
5.	Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?	☒Yes	☐No	
6.	Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts?	☒Yes	☐No	☐NA

Design Pollution Prevention BMPs
Checklist DPP-1, Part 1

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Consideration of Design Pollution Prevention BMPs

1. Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]?

(a) Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
(b) Will the project discharge to unlined channels?	☐Yes	☒No	☐NA
(c) Will project increase potential sediment load of downstream flow?	☒Yes	☐No	☐NA
(d) Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☒Yes	☐No	☐NA

If Yes was answered to any of the above questions, consider ***Downstream Effects Related to Potentially Increased Flow***, complete the DPP-1, Part 2 checklist.

2. Slope/Surface Protection Systems

(a) Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA

If Yes was answered to the above question, consider ***Slope/Surface Protection Systems***, complete the DPP-1, Part 3 checklist.

3. Concentrated Flow Conveyance Systems

(a) Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
(b) Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
(c) Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
(d) Will cross drains be modified?	☒Yes	☐No	☐NA

If Yes was answered to any of the above questions, consider ***Concentrated Flow Conveyance Systems***; complete the DPP-1, Part 4 checklist.

4. Preservation of Existing Vegetation

a) It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects. ☒Complete

Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.

Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Downstream Effects Related to Potentially Increased Flow

1. Review total paved area and reduce to the maximum extent practicable. ☒Complete
2. Review channel lining materials and design for stream bank erosion control. ☒Complete
   (a) See Chapters 860 and 870 of the HDM. ☒Complete
   (b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity. ☒Complete
3. Include, where appropriate, energy dissipation devices at culvert outlets. ☒Complete
4. Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour. ☒Complete
5. Include, if appropriate, peak flow attenuation basins to reduce peak discharges. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405
PM (KP): PM 10.3/24.1 EA: 0H100K
RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Slope / Surface Protection Systems

1. What are the proposed areas of cut and fill? (attach plan or map) ☒Complete

2. Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows? ☒Yes ☐No

3. Were slopes rounded and/or shaped to reduce concentrated flow? ☒Yes ☐No

4. Were concentrated flows collected in stabilized drains or channels? ☒Yes ☐No

5. Are slopes > 1:4 vertical:horizontal (V:H))? ☒Yes ☐No

   If Yes, District Landscape Architecture must prepare or approve an erosion control plan.

6. Are slopes > 1:2 (V:H)? ☐Yes ☒No

   If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 1:2 (V:H).

7. Estimate the change to the impervious areas that will result from this project. 111 acres ☒Complete

VEGETATED SURFACES

1. Identify existing vegetation. ☒Complete
2. Evaluate site to determine soil types, appropriate vegetation and planting strategies. ☒Complete
3. How long will it take for permanent vegetation to establish? ☒Complete
4. Minimize overland and concentrated flow depths and velocities. ☒Complete

HARD SURFACES

1. Are hard surfaces required? ☒Yes ☐No

   If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations. ☐Complete

Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems. ☐Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Chapters 813, 836, and 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☒Complete

Overside Drains

1. Consider downdrains, as per Index 834.4 of the HDM. ☒Complete
2. Consider paved spillways for side slopes flatter than 1:4 V:H. ☒Complete

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 5

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Preservation of Existing Vegetation

1. Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation. ☒Complete

2. Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans? ☐Yes ☒No

3. Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling? ☒Complete

4. Have impacts to preserved vegetation been considered while work is occurring in disturbed areas? ☒Yes ☐No

5. Are all areas to be preserved delineated on the plans? ☒Yes ☐No

Treatment BMPs

Checklist T-1, Part 1

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Consideration of Treatment BMPs

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watersheds within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed.

1. Dry Weather Flow Diversion

   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐Yes ☒No

   (b) Is a sanitary sewer located on or near the site? ☒Yes ☐No

   (c) Is the connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? ☐Yes ☒No

   (d) Is the domestic wastewater treatment authority willing to accept flow? ☐Yes ☒No

   If Yes was answered to <u>all</u> of these questions consider Dry Weather Flow Diversion, complete and attach Part 3 of this checklist

2. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☐Yes ☒No

   If Yes, consider Gross Solids Removal Devices (GSRDs), complete and attach Part 6 of this checklist. Note: Biofiltration Systems, Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter – consult with District/Regional NPDES if these devices should be considered to meet litter/trash TMDL.

3. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year?
   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist. ☐Yes ☒No

4. (a) Are there local influent limits for infiltration or Basin Plan restrictions or other local agency prohibitions that would restrict the use of the infiltration devices? ☐Yes ☒No

(b) Would infiltration pose a threat to local groundwater quality as determined by the District/Regional Storm Water Coordinator? ☐Yes ☒No

If the answer to either part of Question 4 is Yes, then Infiltration Devices are infeasible and the consideration of Infiltration Devices should not be made when completing Questions 5 through 17.

5. (a) Does the project discharge to any 303(d) listed water body? ☐Yes ☒No
   If No, go to Question 17, General Purpose Pollutant Removal

   (b) If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply):

   ___phosphorus, ___nitrogen, ___total copper, ___dissolved copper,

   ___total lead ___dissolved lead, ___total zinc, ___dissolved zinc,

   ___sediments, ___general metals [unspecified metals].

   (c) If only one TDC is checked above, continue to Question 6. ☐Complete

   (d) If more than one TDC is checked, contact your District/Regional NPDES Coordinator to determine priority before continuing with this checklist. ☐Complete

6. Consult with the District/Regional Storm Water Coordinator to determine whether Treatment BMP selection will be affected by any existing or future TMDL requirements. ☐Complete

The following questions show the approved Treatment BMPs in order of preference based on load reduction (performance) for the listed constituent and lifetime costs for the device, excluding right-of-way. Note that a line separates Treatment BMPs into groups of approximately equal effectiveness and within each grouping, any of the Treatment BMPs may be selected for placement if meeting site conditions. In the space provided next to the BMP, use Yes or a check mark to indicate a positive response.

If none of the listed Treatment BMPs for a specific constituent of concern (TDC) can be sited, go to Step #17 (General Purpose Pollutant Removal) to determine whether another Treatment BMP can be incorporated into the project.

***For the SWDRs developed for the PID and PA/ED phases of a project:* Consider all approved Treatment BMPs listed that can be reasonably incorporated into the project for each TDC.**

***For the SWDR developed for the PS&E phase:* Indicate (Yes or check mark) only those BMPs that will be incorporated into the project.**

7. Is phosphorus the TDC? [Use this constituent if "eutrophic" or "nutrients" is the TDC for the water body.] If Yes, consider: ☐Yes ☐No

   _____Infiltration Devices
   _____Austin Sand Filters

8. Is nitrogen the TDC? If Yes, consider: ☐Yes ☐No

_____Infiltration Devices
_____Austin Sand Filters
_____Delaware Filter
_____Detention Device
_____MCTT

9. Is copper (total) the TDC? If Yes for total Copper, consider: ☐Yes ☐No

_____Infiltration Devices
_____Wet Basins
_____Biofiltration Strips
_____Detention Device
_____Biofiltration Swales
_____Austin Sand Filter
_____Delaware Filter
_____MCTT

10. Is copper (dissolved) the TDC? If Yes for dissolved Copper, consider: ☐Yes ☐No

_____Infiltration Devices
_____Biofiltration Strips
_____Wet Basin
_____Biofiltration Swale

11. Is lead (total) the TDC? If Yes for total Lead, consider: ☐Yes ☐No

_____Infiltration Devices
_____Wet Basin
_____Biofiltration Strips
_____Austin Sand Filter
_____**Delaware Filter**
_____Detention Device
_____Biofiltration Swales
_____MCTT

12. Is lead (dissolved) the TDC? If Yes for dissolved Lead, consider: ☐Yes ☐No

_____Infiltration Devices
_____Biofiltration Strips
_____Wet Basin
_____Detention Device
_____Biofiltration Swales
_____Austin Sand Filter

13. Is zinc (total) the TDC? If Yes for total Zinc, consider: ☐Yes ☐No

_____Infiltration Devices
_____Delaware Filter
_____Wet Basin
_____Biofiltration Strips
_____Biofiltration Swales
_____Austin Sand Filter
_____MCTT
_____Detention Devices

14. Is zinc (dissolved) the TDC? If Yes for dissolved Zinc, consider: ☐Yes ☐No

    _____ Infiltration Devices
    _____ Delaware Filter
    _____ Biofiltration Strip
    _____ Biofiltration Swale
    _____ Austin Sand Filter
    _____ MCTT

15. Is sediment (total suspended solids [TSS]) the TDC? If Yes for TSS, consider: ☐Yes ☐No

    _____ Infiltration Devices
    _____ Austin Sand Filter
    _____ Delaware Filter
    _____ Wet Basin
    _____ Detention Device
    _____ Biofiltration Strip
    _____ MCTT
    _____ Biofiltration Swale

16. Are "General Metals" or (unspecified) "Metals" the TDC? If Yes for General Metals, consider: ☐Yes ☐No

    _____ Infiltration Devices
    _____ Biofiltration Strips
    _____ Wet Basin
    _____ Biofiltration Swale
    _____ Austin Sand Filter
    _____ Delaware Filter
    _____ MCTT

17. General Purpose Pollutant Removal.: When it is determined that there are no TDCs, consider the Treatment BMPs in the order listed below. ☒Yes ☐No

    X Infiltration Devices
    X Biofiltration Strips
    X Wet Basin
    X Biofiltration Swale
    X Austin Sand Filter
    X Detention Device
    X Delaware Filter
    X MCTT

18. Biofiltration
    (a) Are site conditions and climate favorable to allow suitable vegetation to be established? ☒Yes ☐No

    (b) Have Biofiltration strips and swales been considered to the extent practicable? Note: Biofiltration BMPs should be considered for all projects, even if other Treatment BMPs are placed. ☒Yes ☐No

    If No to (a) or (b), document justification in Section 5 of the SWDR.

19. After completing the above, complete and attach the checklists shown below for every Treatment BMP under consideration ☒Complete

- **X** Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 2
- ____ Dry Weather Diversion: Checklist T-1, Part 3
- **X** Infiltration Devices: Checklist T-1, Part 4
- **X** Detention Devices: Checklist T-1, Part 5
- ____ GSRDs: Checklist T-1, Part 6
- ____ Traction Sand Traps: Checklist T-1, Part 7
- **X** Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
- ____ Multi-Chambered Treatment Train: Checklist T-1, Part 9
- ____ Wet Basins: Checklist T-1, Part 10

20. (a) Estimate what percentage of WQV/WQF will be treated by the preferred Treatment BMP(s): 100 % ☒Complete

(b) Have Treatment BMPs been considered for use in parallel or series to increase this percentage? ☒Yes ☐No

21. Prepare cost estimate, including right-of-way, for selected Treatment BMPs and include as supplemental information for SWDR approval. ☒Complete

Treatment BMPs

Checklist T-1, Part 2

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No

2. Are flow velocities < 4 fps (i.e. low enough to prevent scour of the vegetated bioswale as per HDM Table 873.3E)? ☒Yes ☐No

   If No to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known hazardous soils or contaminated groundwater plumes exist? ☐Yes ☒No
   If Yes, consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place biofiltration device(s)? ☒Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration Devices and how much right-of way would be needed to treat WQF? _____ acres ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * ☐Yes ☒No

2. Can the bioswale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g. freeboard, minimum slope, etc.) ☒Yes ☐No

3. Can the bioswale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.2.3.1)* ☒Yes ☐No

4. Is the maximum length of a biostrip ≤ 300 ft? * ☒Yes ☐No

5. Has the minimum width (in the direction of flow) of the invert of the bioswale received the concurrence of Maintenance? * ☒Yes ☐No

6. Can bioswales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? ** ☒Yes ☐No

7. Is the biostrip sized as long as possible in the direction of flow? ** ☒Yes ☐No

8. Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? ** ☒Yes ☐No

Treatment BMPs
Checklist T-1, Part 4

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Infiltration Devices

Feasibility

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality as determined by the District/Regional NPDES Storm Water Coordinator?	☐Yes	☒No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐Yes	☒No
3.	Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%?	☐Yes	☒No
4.	At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr?	☐Yes	☒No
5.	Is site located over a previously identified contaminated groundwater plume?	☐Yes	☒No
	If Yes to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.		
6.	(a) Does site have groundwater within 10 ft of basin invert?	☐Yes	☒No
	(b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr?	☐Yes	☒No
	If Yes to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration.	☐Yes	☐No
7.	Does adequate area exist within the right-of-way to place Infiltration Device(s)? If Yes, continue to Design Elements sections. If No, continue to Question 8.	☒Yes	☐No
8.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of way would be needed to treat WQV? _____ acres If Yes, continue to Design Elements section. If No, continue to Question 9.	☐Yes	☐No
9.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements – Infiltration Basin

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☒No
2.	Has an overflow spillway with scour protection been provided? *	☒Yes	☐No
3.	Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) *	☒Yes	☐No
4.	Can access be placed to the invert of the Infiltration Basin? *	☒Yes	☐No
5.	Can the Infiltration Basin accommodate the Water Quality freeboard above the WQV elevation (reference Appendix B.1.3.1)? *	☒Yes	☐No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 1:4(V:H) (may be 1:3 [V:H] with approval by District Maintenance)? *	☒Yes	☐No
7.	Can vegetation be established in the Infiltration Basin? **	☒Yes	☐No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☒Yes	☐No
9.	Can a gravity-fed Maintenance/Emergency Drain be placed? **	☒Yes	☐No

Design Elements – Infiltration Trench

* **Required** Design Element – (see definition above)
** **Recommended** Design Element – (see definition above)

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☒No
2.	Is the surrounding soil within Hydrologic Soil Groups (HSG) Types A or B? *	☒Yes	☐No
3.	Is the volume of the Infiltration Trench equal to at least the 2.85x the WQV, while maintaining a drawdown time of ≤ 72 hours? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet], unless the District/Regional NPDES Coordinator will allow a volume between 2,830 ft^3 and 4,356 ft^3 to be considered.) *	☒Yes	☐No
4.	Is the depth of the Infiltration Trench ≤ 13 ft, and is the depth < the width? *	☒Yes	☐No
5.	Can an observation well be placed in the trench? *	☒Yes	☐No
6.	Can access be provided to the Infiltration Trench? *	☒Yes	☐No
7.	Can pretreatment be provided to capture sediment in the runoff (such as using Biofiltration)? *	☒Yes	☐No
8.	Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality Event? **	☒Yes	☐No
9.	Can a perimeter curb or similar device be provided (to limit wheel loads upon the trench)? **	☒Yes	☐No

Treatment BMPs
Checklist T-1, Part 5

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Detention Devices

Feasibility

1. Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems? ☒Yes ☐No

2. 2a) Is the volume of the Detention Device equal to at least the WQV? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No

   Only answer (b) if the Detention Device is being used also to capture traction sand.

   2b) Is the total volume of the Detention Device at least equal to the WQV and the anticipated volume of traction sand, while maintaining a minimum 12 inch freeboard (1 ft)? ☐Yes ☐No

3. Is basin invert ≥ 10 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☒Yes ☐No

If No to any question above, then Detention Devices are not feasible.

4. Does adequate area exist within the right-of-way to place Detention Device(s)?

   If Yes, continue to the Design Elements section. If No, continue to Question 5. ☒Yes ☐No

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Detention Device(s) and how much right-of way would be needed to treat WQV? _____ acres
   If Yes, continue to the Design Elements section. If No, continue to Question 6. ☐Yes ☐No

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has the geotechnical integrity of the site been evaluated to determine potential impacts to surrounding slopes due to incidental infiltration? If incidental infiltration through the invert of an unlined detention device is a concern, consider using an impermeable liner. *	☐Yes	☒No
2.	Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *	☐Yes	☒No
3.	Can a minimum freeboard of 12 inches be provided above the WQV? *	☒Yes	☐No
4.	Is an overflow outlet provided? *	☒Yes	☐No
5.	Is the drawdown time of the Detention Device within 24 to 72 hours? *	☒Yes	☐No
6.	Is the Detention Device outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? *	☒Yes	☐No
7.	Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? *	☒Yes	☐No
8.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas. *	☒Yes	☐No
9.	Has sufficient access for Maintenance been provided? *	☒Yes	☐No
10.	Is the side slope 1:4 (V:H) or flatter for interior slopes? ** (Note: Side slopes up to 1:3 (V:H) allowed with approval by District Maintenance.)	☒Yes	☐No
11.	If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? **	☒Yes	☐No
12.	Is flow path as long as possible ($\geq$ 2:1 length to width ratio at WQV elevation is recommended)? **	☒Yes	☐No

Treatment BMPs
Checklist T-1, Part 8

Prepared by: Ryan Hansen Date: 4/14/08 District-Co-Route: 12-ORA-405

PM (KP): PM 10.3/24.1 EA: 0H100K

RWQCB: Santa Ana Regional Water Quality Control Board (Region 8)

Media Filters

Caltrans has approved two types of Media Filter: Austin Sand Filters and Delaware Filters. Austin Sand filters are typically designed for larger drainage areas, while Delaware Filters are typically designed for smaller drainage areas. The Austin Sand Filter is constructed with an open top and may have a concrete or earthen invert, while the Delaware is always constructed as a vault. See Appendix B, Media Filters, for a further description of Media Filters.

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No

3. If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater? ☒Yes ☐No

4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☒Yes ☐No

   If No to any question above, then an Austin Sand Filter is not feasible.

5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☒Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section.

   If No, continue to Question 7.

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐ Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Feasibility- Delaware Filter

1. Is the volume of the Delaware Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet], consult with District/Regional NPDES if a lesser volume is under consideration.) ☒Yes ☐No

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No

3. Would a permanent pool of water be allowed by the local vector control agency? ☐Yes ☒No

If No to any question, then a Delaware Filter is not feasible

4. Does adequate area exist within the right-of-way to place a Delaware Filter (s)? If Yes, continue to Design Elements sections. If No, continue to Question 5. ☐Yes ☐No

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres If Yes, continue to the Design Elements section. If No, continue to Question 6. ☐Yes ☐No

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐ Complete

If a Delaware Filter is still under consideration, continue to the Design Elements – Delaware Filter section.

Design Elements – Austin Sand Filter

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Is the drawdown time of the 2nd chamber 24 hours? * ☒Yes ☐No

2. Is access for Maintenance vehicles provided to the Austin Sand Filter? * ☒Yes ☐No

3. Is a bypass/overflow provided for storms > WQV? * ☒Yes ☐No

4. Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? ** ☒Yes ☐No

5. Can pretreatment be provided to capture sediment and litter in the runoff (such as using biofiltration)? ** ☒Yes ☐No

6. Can the Austin Sand Filter be placed using an earthen configuration? ** If No, go to Question 9. ☒Yes ☐No

7.	Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft? * If No, design with an impermeable liner.	☒Yes	☐No
8.	Are side slopes of the earthen chamber 1:3 (V:H) or flatter? *	☒Yes	☐No
9.	Is maximum depth ≤ 13 ft below ground surface? *	☒Yes	☐No
10.	Can the Austin Sand Filter be placed in an offline configuration? **	☐Yes	☒No

Design Elements – Delaware Filter

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Can the first chamber be sized for the WQV? *	☐Yes	☐No
2.	Is the drawdown time of the 2nd chamber between 40 and 48 hours? *	☐Yes	☐No
3.	Is access for Maintenance vehicles provided to the Delaware Filter? *	☐Yes	☐No
4.	Is a bypass/overflow provided for storms > WQV? **	☐Yes	☐No
5.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using biofiltration)? **	☐Yes	☐No
6.	Can the Delaware Filter be placed in an offline configuration? **	☐Yes	☐No
7.	Is maximum depth ≤ 13 ft below ground surface? *		

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Attachment A

Project Location Map/ Project Vicinity Map

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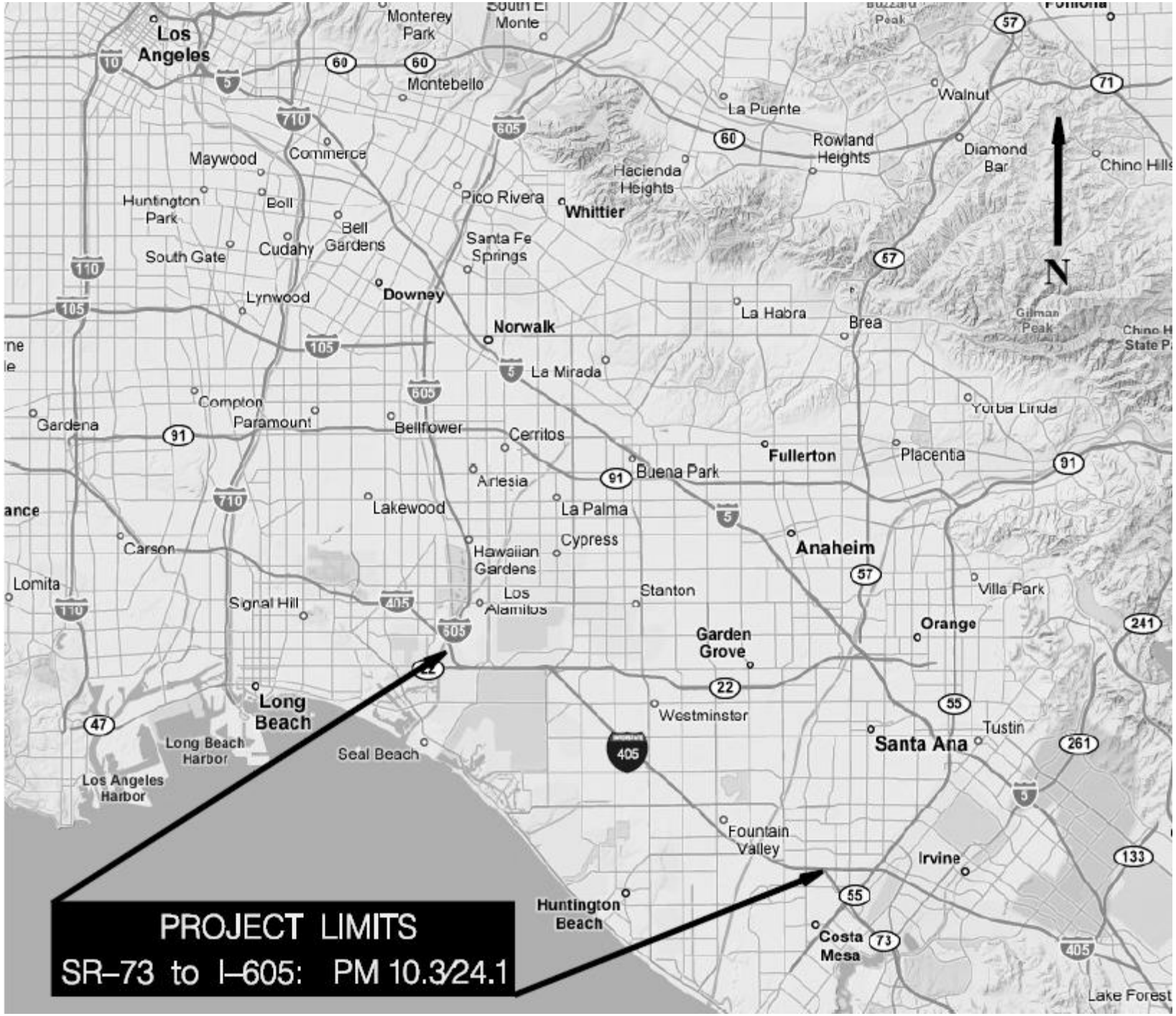
I-405 Highway Widening Project (EA 0H100K) Location/Vicinity Map
Postmile 10.3/24.1



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Attachment B

Treatment BMP Layout Sheets 1-10

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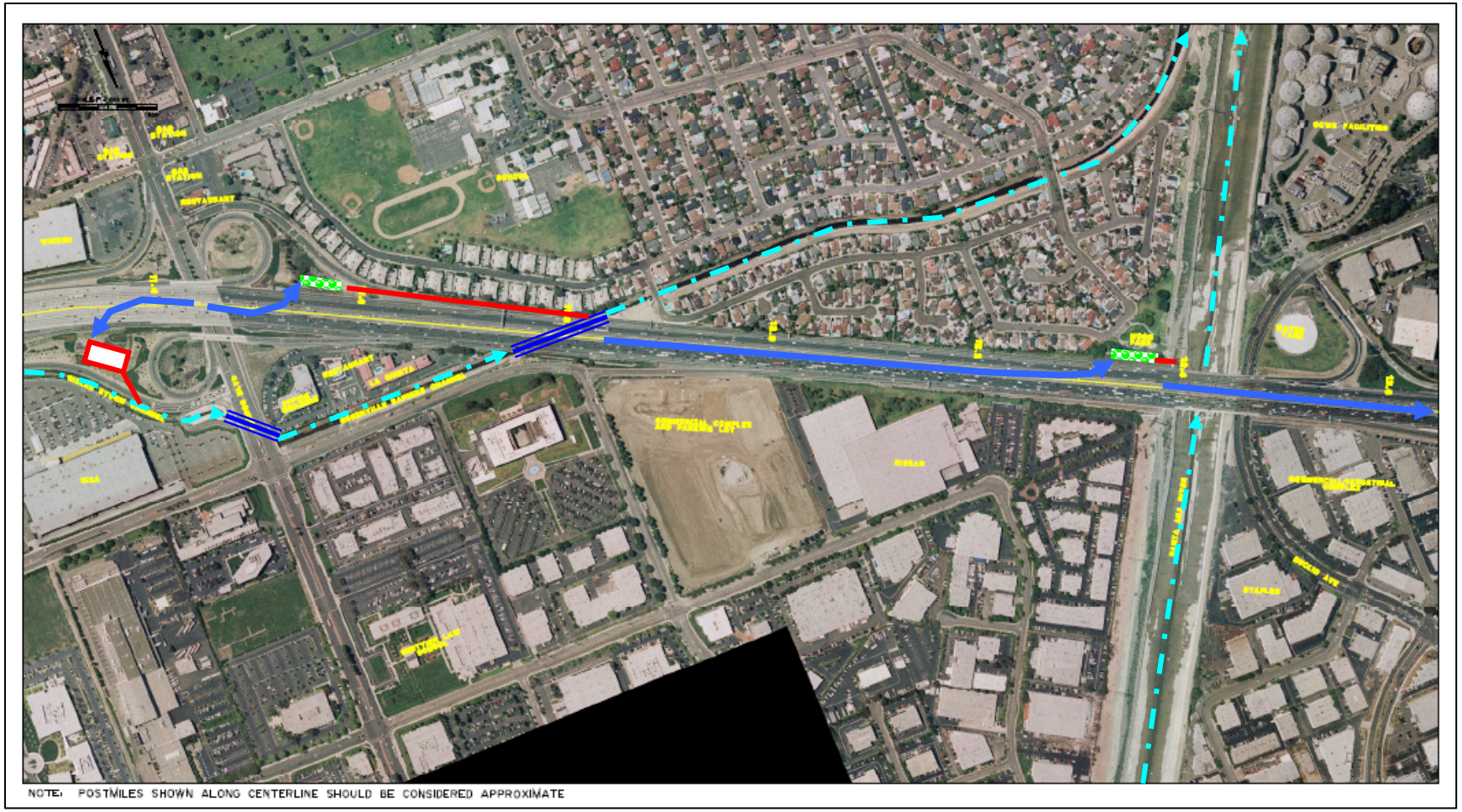
I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 1



Existing Channel

Proposed Biofiltration Swale/Strip Site

Existing Culvert

Proposed Detention Device, Infiltration Device, or Media Filter Site

Proposed Pipe

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 2

Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 3

Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 4

Existing Channel

Existing Culvert

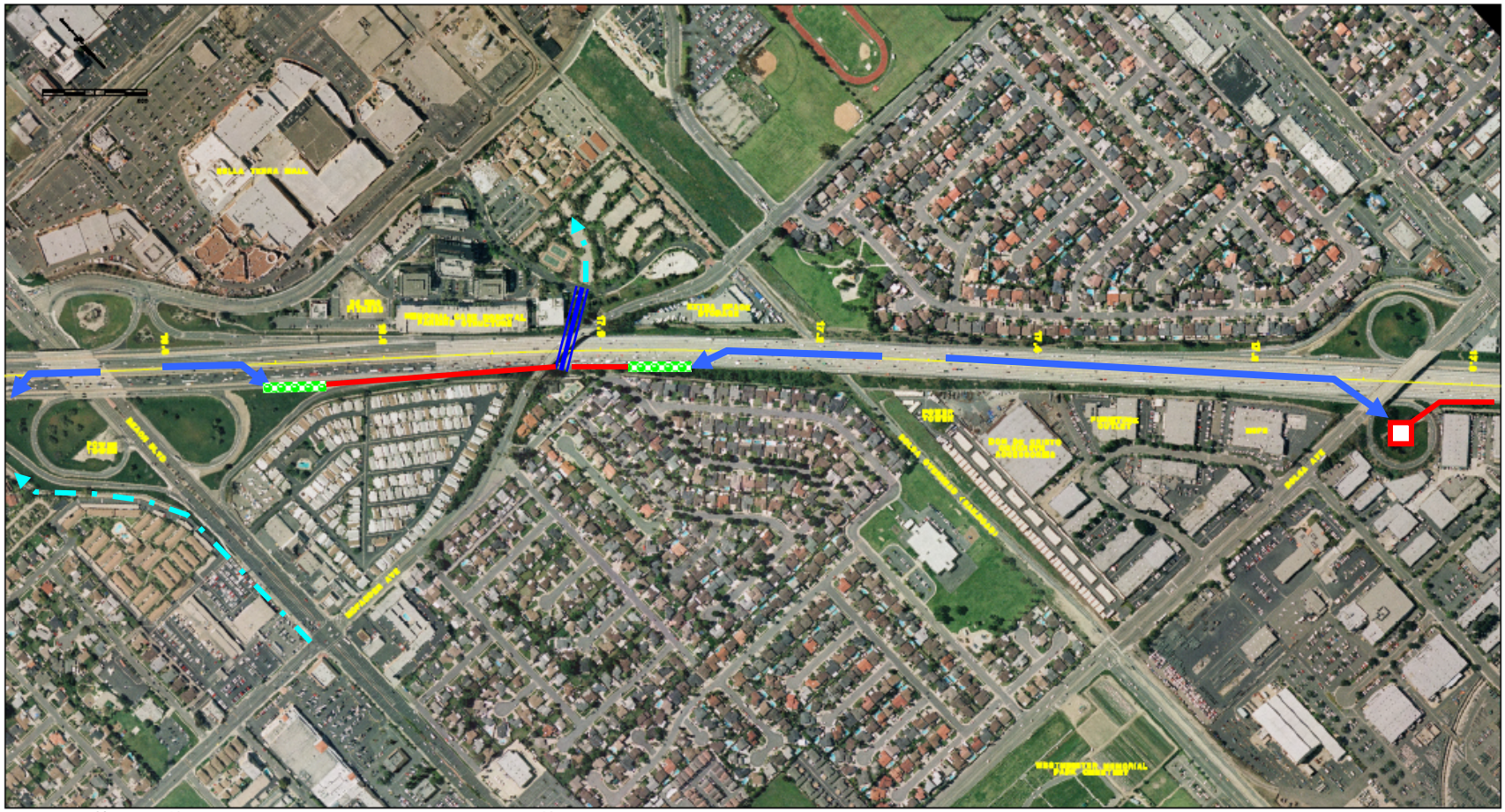
Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 5



Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 6

Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 7

Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 8

Existing Channel

Existing Culvert

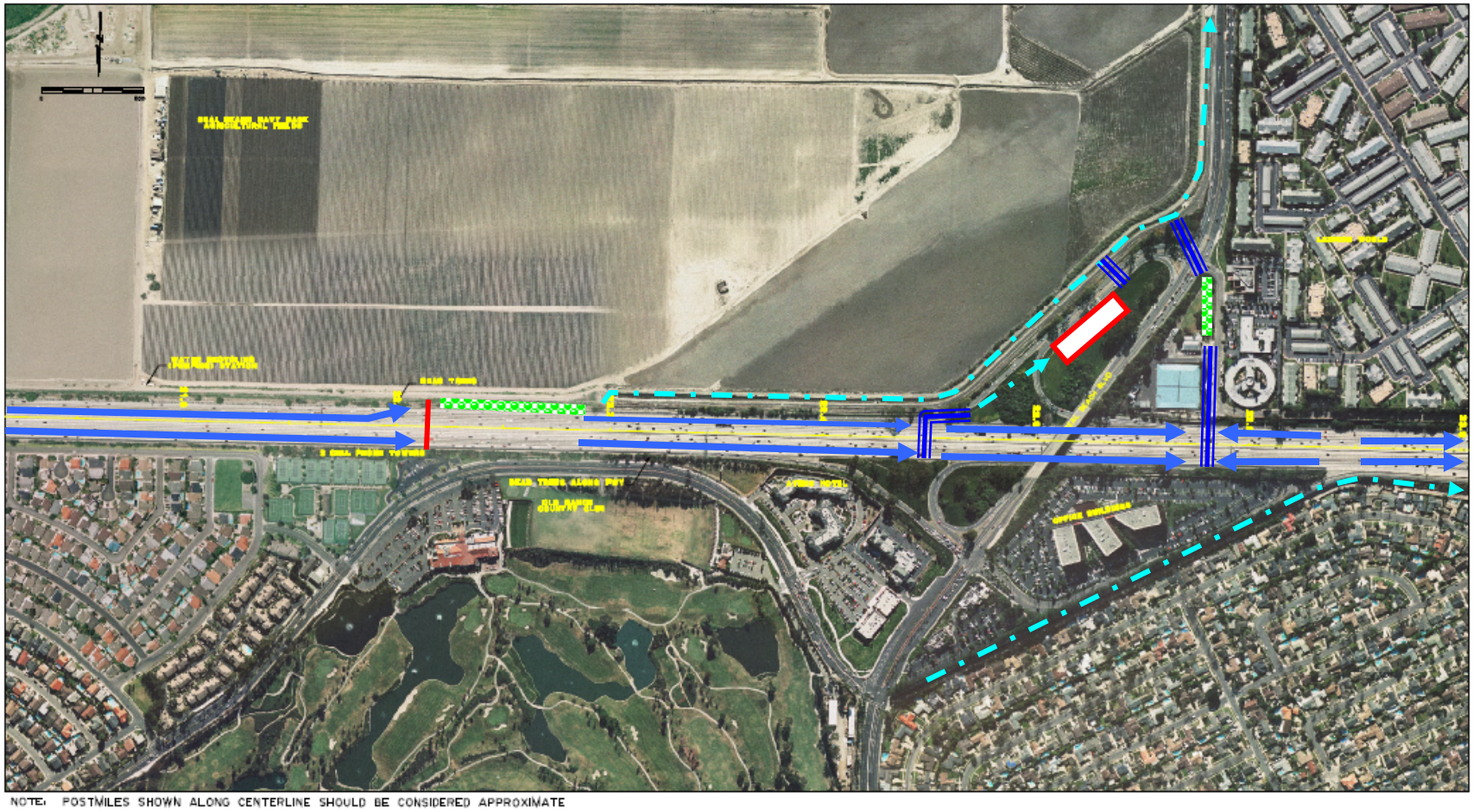
Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 9



Existing Channel

Proposed Biofiltration Swale/Strip Site

Existing Culvert

Proposed Detention Device, Infiltration Device, or Media Filter Site

Proposed Pipe

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 10

Existing Channel

Proposed Biofiltration Swale/Strip Site

Existing Culvert

Proposed Detention Device, Infiltration Device, or Media Filter Site

Proposed Pipe

Direction of Surface Flow

Attachment C

Storm Water BMP Cost Summary

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I-405 Highway Widening Project (EA 0H100K) BMP Cost Estimate

Percentage of Total Cost Method:
The Caltrans Project Planning and Design Guide (PPDG, May 2007) identifies the Percentage of Total Cost Method, as an acceptable means to estimate Storm Water Quality Best Management Practices (BMPs) for projects in the Project Initiation Document (PID) phase. Costs for Construction Site BMPs typically range from 1% to 2% of the total project cost. The PPDG provides adjustment factors for project specific site conditions. These adjustments are added together and multiplied by the total estimated construction cost as follows:

Description	Recommended Adjustment (%)
Baseline Cost Percentage	**1.25**
Project Cost Greater than $12,000,000	0.0
Adjustment for Type of Project	0.0
Adjustment for Work near 303(d) Water Bodies	0.0
Total Adjustment for Water Pollution Control	**1.25**

The total construction cost for this project is estimated to be $1.07 billion.
1.25% * $1.07 billion = $13.4 million.

Therefore, the PID phase estimate for Water Pollution Control is $13,400,000.

Since Treatment BMPs are not defined well enough at the PID phase, the PPDG recommends that $100,000 to $250,000 per lane mile should be added to cover costs associated with incorporating Treatment BMPs for Major Reconstruction Projects. The lower end of this range would apply to projects such as this, that are not adjacent to a 303(d) listed water body. The proposed project is anticipated to result in the addition of 50.4 lane miles.

50.4 * $100,000 = $5,040,000

Therefore, the PID phase estimate for Treatment BMPs is $5,040,000.

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ATTACHMENT 8

DRAINAGE REPORT

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CONCEPT DRAINAGE REPORT

FOR THE
INTERSTATE-405
FREEWAY WIDENING PROJECT
BETWEEN
HARBOR BLVD/HYLAND AVE AND INTERSTATE-605
POSTMILE 10.3/24.1

Prepared For: **Caltrans**

Prepared By: **Parsons**
2201 Dupont Drive, Suite 200
Irvine, CA 92612

June 17, 2008

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TABLE OF CONTENTS

SECTIONS

APPENDICES

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1.0 INTRODUCTION

The Orange County Transportation Agency (OCTA) in cooperation with the California Department of Transportation (Caltrans) proposes to widen Interstate-405 (I-405) from Euclid Street to Interstate-605 (I-605) in an effort to improve traffic flow. Improvements proposed by this project include: 1) freeway widening with lanes added in both directions, 2) bridge lengthening and widening to accommodate the freeway widening, 3) interchange improvements at each interchange along the alignment, and 4) associated retaining wall, sound wall, and drainage facility construction. Flows from the site currently enter existing flood control channels/ culverts which generally convey flow in a southwesterly direction under the freeway. Figure 1 shows the locations of the major flood control facilities and direction of off-site flows that cross the alignment. As shown, the proposed project is approximately 13.8 miles in length. This portion of Interstate 405 resides in the East Coastal Plain Hydrologic Sub-Area (801.11) and the Anaheim Hydrologic Sub-Area (845.61) in accordance with the Santa Ana Regional Water Quality Control Board RWQCB) Basin Plan.

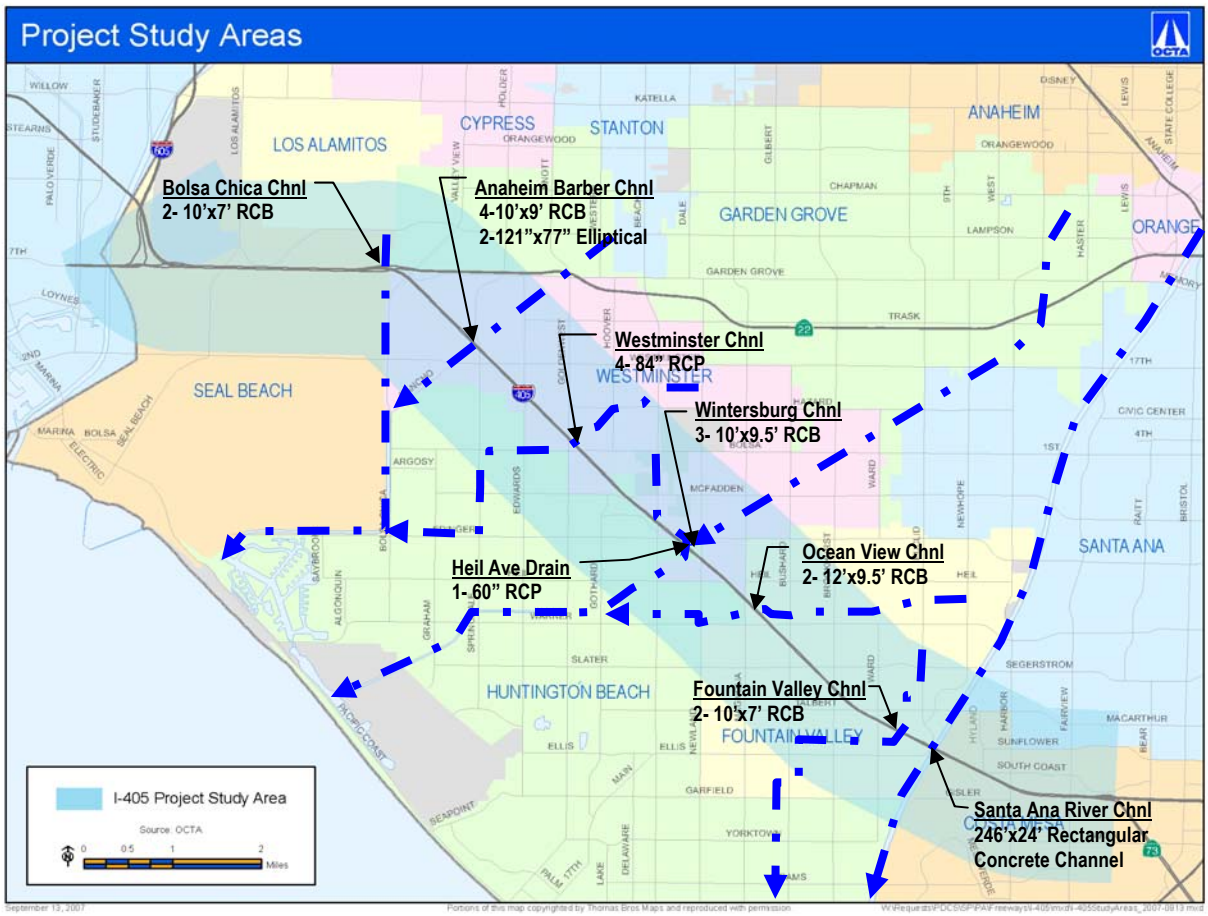

Figure 1: Project Location and Offsite Channel Alignments

2.0 EXISTING DRAINAGE SYSTEM

In general, on-site runoff including pavement and landscaped areas within the right-of-way drain to storm drain systems that convey flow to the off-site systems shown in Figure 1. The on-site drainage facilities are designed to accommodate a 25-year return frequency storm and inlets are spaced and sized to prevent spread from exceeding the limits of the shoulders. The off-site system is designed to accommodate a 100-year return frequency storm and generally consists of concrete channels and culverts that allow flow to pass under the freeway as shown in Figure 1.

The project traverses three watersheds: 1) the Santa Ana River Watershed, 2), the Talbert Watershed, and 3) the Westminster Watershed. Within these watersheds, the project crosses eight water bodies as displayed in Figure 1. These include the Santa Ana River Channel, East Fountain Valley Channel, Ocean View Channel, Heil Avenue Storm Drain, East Garden Grove-Wintersburg Channel, Westminster Channel, Anaheim-Barber City Channel, and Bolsa Chica Channel. Each of these facilities has been designated as flood plain (flood hazard area Zone A) with the Zone A flood plain staying within the channels in the vicinity of the project area with the exception of the Ocean View Channel and East Garden Grove-Wintersburg Channel. These two channels are currently undersized for conveyance of the 100-year runoff flow. As part of the project, the Orange County Flood Control District (OCFCD) may require culverts to be added under the freeway to improve the existing flood conditions within this area. FEMA Flood Improvement Rate Maps (FIRMs) that identify the hazard areas include map panels 06059C0259H, -0258H, -0254H, -0253H, -0251H, -0232H, -0119H and -0118H. The sizes of the off-site cross-drainage systems are provided in Figure 1.

The climate in the project area is classified as Mediterranean, characterized by warm, dry summers and mild, wet winters. The mean high winter temperature is 65°F, and the mean high summer temperature is 77°F. The rainy season is from October 1st through May 1st. However, most rainfall occurs during the winter season, December through February. The annual average rainfall is approximately 13 inches. Soils within the project area are classified as Hydrologic Soils Groups A, B, and C.

3.0 PROPOSED DRAINAGE SYSTEM

The proposed drainage system will include a retrofitted on-site drainage system that will convey runoff from pavement areas to treatment BMPs placed strategically along the alignment. There are currently 34 BMPs conceptually proposed for the project including biofiltration swales/strips, infiltration devices, detention devices and media filters. The existing drainage systems may require lengthening and some pipe jacking to allow conveyance of the on-site flows to the proposed BMPs. Lengthening of the off-site drainage cross-culverts will also be required in order to accommodate the proposed widening. Appendix A includes 10 drainage layout sheets depicting the on-site drainage flow patterns and placement of the BMPs along the project alignment.

The proposed project will add impervious surface to the watershed. This increase in impervious surface will create minor increases in flow for the off-site drainage system. Within the project limits, the existing paved surface area is measured to be 293 acres. The proposed project would add an additional 111 acres of paved surface area. Therefore, the velocity and volume of downstream flow is expected to increase. The total off-site watershed area within the project limits, however, is 2896 square miles. This equates to an increase of paved surface within the watershed of only 0.006 percent which translates into only minor localized increases in urban runoff within the off-site storm drain system. Any increase in off-site flow is therefore rendered insignificant. However, in the vicinity of Wintersburg Channel and Oceanview Channel, upsizing of cross-culverts may be required to accommodate existing 100-year flood flows which exceed the capacity of the existing system. Table 1 presents a compilation of the proposed off-site drainage system requirements while Figure 1 presents the sizes of the facilities.

Table 1: Proposed Off-Site Drainage System Requirements

I-405 Postmile	Waterbody	Proposed Work Near Waterbody
12.4	Santa Ana River	Widening I-405 over the river, which will entail placing new piers in the river channel. Hydraulic modeling of the river will be required. Coordination with the Corps of Engineers and OCFCD will also be required.
12.9	East Fountain Valley Channel	Lengthen the existing Reinforced Concrete Box (RCB) on both sides of I-405 and add transitions to the upstream and downstream channel. Coordination with the OCFCD will be required.
14.9	Ocean View Channel	Lengthen the existing RCB on the Northbound side of I-405, possibly adding a culvert adjacent to the existing RCB, and adding transitions to the existing channel on both sides of the freeway. Coordination with the OCFCD will be required.
15.5	Heil Avenue Drain	Lengthen the existing Reinforced Concrete Pipe (RCP) on both sides of I-405 and adding a transition to the existing channel on the north side of the freeway. Coordination with the OCFCD will be required.
15.9	East Garden Grove-Wintersburg Channel	Lengthen the existing RCB on both sides of I-405, possibly adding a culvert adjacent to the existing RCB, and adding transitions to the existing channel on both sides of the freeway. Coordination with the OCFCD will be required.
17.8	Westminster Channel	Road widening should not require work in the channel.
19.4	Anaheim Barber City Channel	Road widening should not require work in the channel.
20.8	Bolsa Chica Channel	Road widening should not require work in the channel.

Several measures will be taken in order to avoid or reduce potential storm water impacts. As described in the Caltrans Storm Water Management Plan (SWMP), Best Management Practices (BMPs) will be designed and implemented to reduce the discharge of pollutants from the Caltrans storm drain system to the Maximum Extent Practicable (MEP). Permanent Treatment BMPs proposed for this project include Biofiltration Strips/Swales, Detention Devices, Infiltration Devices, and Media Filters. Erosion control measures also will be used

to address site soil stabilization and reduce deposition of sediments in adjacent surface waters. Typical measures will include the application of soil stabilizers such as hydroseeding, rock slope protection, velocity dissipation devices, and flared end sections for culverts, and others.

Within the project limits, biofiltration swales are proposed at 20 locations (see Appendix A for locations). The sizing criteria for bioswales are based on the water quality flow (WQF). For the project area, the WQF is calculated using the Rational Method and a precipitation rate of 0.2 inches/hour. This rate is designated in the PPDG (Caltrans, 2007) for Regions 8 (Santa Ana Region). Individual tributary areas and flows to each of the proposed biofiltration swales will be provided at the PA/ED phase. The vegetated trapezoidal swales will be at a slope of less than 2 percent, with 4:1 to 5:1 side slopes, bottom widths of approximately 8 feet, and lengths that will be extended as much as possible to maximize pollutant removal. Swales will be designed to Caltrans standards, which will require water quality flow velocities (equal to the flow generated from the 85th percentile storm) to be low enough to keep Hydraulic Residence Times (HRTs) in the swales greater than 5 minutes, with a Manning's n of 0.25 for mowed grass at flow depths less than 0.5 feet. The swales will be vegetated with native grasses. All of the proposed bioswales will meet Caltrans, Traffic Operations requirements, and the side slopes will be 5:1 or flatter for Clear Recover Zones.

Within the project limits, there are 14 sites that are proposed to have either: 1) Detention Devices, 2) Infiltration Devices, 3) Media Filters, or 4) any combination thereof. All of these devices would meet the standard guidelines set forth in the Caltrans Project Planning and Design Guide (PPDG, 2007) and are shown in the drainage layout sheets provided in Appendix A. Individual tributary areas and water quality volumes (WQVs) to each of the proposed devices will be provided at the PA/ED phase. In accordance with the Basin Sizer Program, the WQV in this area should be computed using a precipitation depth of 0.73 inches.

4.0 SUMMARY

The proposed drainage system for the I-405 Widening Project will include: 1) a retrofitted on-site drainage system that conveys runoff from paved areas to 34 treatment BMPs placed strategically along the alignment, 2) lengthening of off-site drainage cross-culverts in order to accommodate the proposed widening, 3) the addition of cross-culverts in the vicinity of the Wintersburg and Oceanview channels to accommodate existing 100-year storm flows, and regulatory agency coordination with the OCFCD, the RWQCB, and the Corps of Engineers. Appendix A includes 10 drainage layout sheets depicting the drainage flow patterns and placement of the BMPs along the project alignment. The proposed project will add impervious surface to the watershed. Any increase in off-site flow, however, is considered insignificant when related to the total off-site watershed areas. Several measures will be taken in order to avoid or reduce potential storm water impacts. BMPs will be designed and implemented to reduce the discharge of pollutants from the Caltrans storm drain system. Permanent Treatment BMPs proposed for this project include Biofiltration Strips/Swales, Detention Devices, Infiltration Devices, and Media Filters.

Appendix A

Drainage Layout Sheets

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I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 1

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 2

Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 3

Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 4

Existing Channel

Proposed Biofiltration Swale/Strip Site

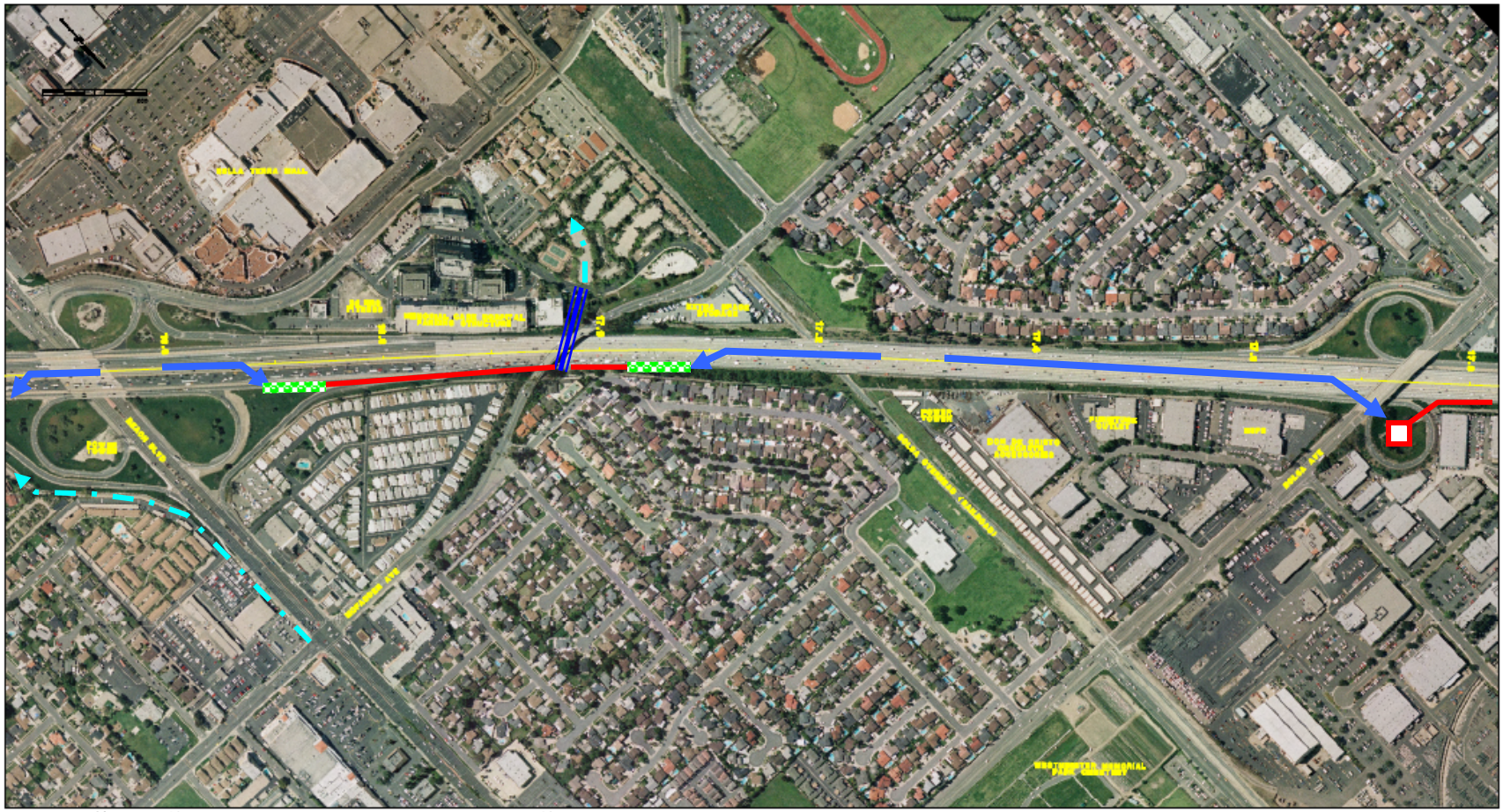
Existing Culvert

Proposed Detention Device, Infiltration Device, or Media Filter Site

Proposed Pipe

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 5



Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 6

Existing Channel

Existing Culvert

Proposed Pipe

Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 7

Existing Channel

Existing Culvert

Proposed Pipe

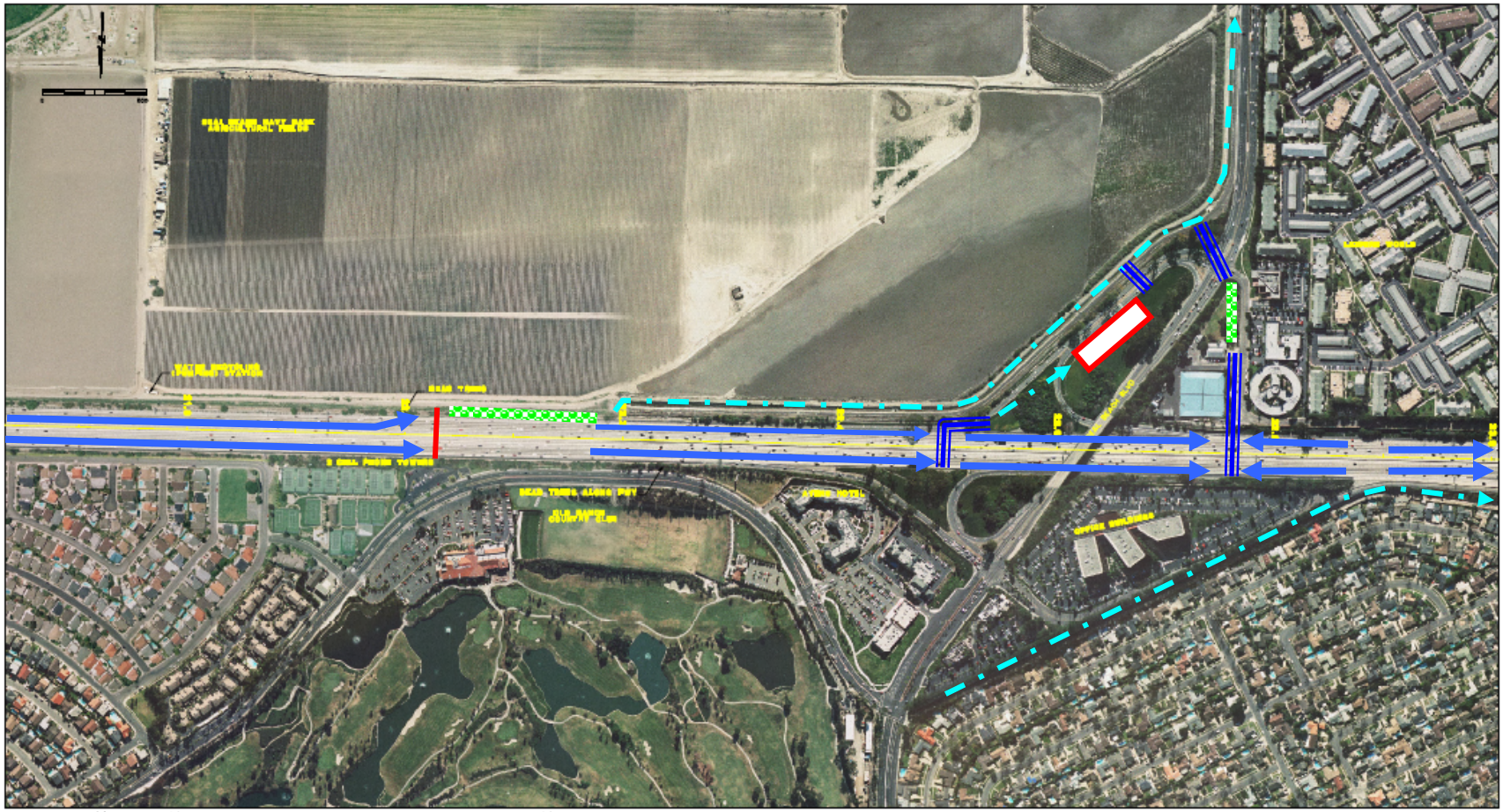
Proposed Biofiltration Swale/Strip Site

Proposed Detention Device, Infiltration Device, or Media Filter Site

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 8

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 9



Existing Channel

Proposed Biofiltration Swale/Strip Site

Existing Culvert

Proposed Detention Device, Infiltration Device, or Media Filter Site

Proposed Pipe

Direction of Surface Flow

I-405 Highway Widening Project (EA 0H100K) Treatment BMP Layout Sheet 10

Existing Channel

Proposed Biofiltration Swale/Strip Site

Existing Culvert

Proposed Detention Device, Infiltration Device, or Media Filter Site

Proposed Pipe

Direction of Surface Flow

ATTACHMENT 9

YEAR 2030 MAINLINE PEAK HOUR TRAVEL DEMAND TRAFFIC VOLUME FORECASTS

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I-405 Mainline AM Peak Hour Travel Demand Forecast for Year 2030

	Baseline				Alternative 1				Alternative 2			
Location on I-405	Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
	GP	HOV	GP	HOV	GP	HOV	GP	HOV	GP	HOV	GP	HOV
	9,800	2,800	11,300	2,400	10,600	2,800	11,600	2,400	10,800	2,800	11,800	2,500
SR-73												
	11,300	2,100	15,100	2,200	11,700	2,000	15,500	2,300	12,500	2,100	16,500	2,300
Fairview Street												
	11,300	2,100	15,800	2,200	11,700	2,000	16,300	2,300	12,500	2,100	17,300	2,300
Harbor Boulevard												
	11,600	2,000	14,200	2,400	12,500	1,900	15,400	2,500	13,000	2,100	15,900	2,500
Euclid Street/Ellis Avenue												
	10,400	2,000	12,500	2,400	10,700	1,900	13,700	2,500	11,200	2,100	14,400	2,500
Brookhurst Street/Talbert Avenue												
	9,600	2,300	11,400	2,700	11,000	2,100	13,200	2,400	11,400	2,000	14,500	2,100
Magnolia Street/Warner Avenue												
	10,100	2,000	11,100	2,500	11,300	1,900	12,800	2,400	12,000	1,600	14,200	2,300
Beach Boulevard/Edinger Avenue												
	9,900	2,200	10,800	2,400	11,600	1,800	12,200	2,300	12,600	1,600	13,800	1,900
Goldenwest Street/Bolsa Avenue												
	10,400	2,300	10,900	2,500	11,700	1,800	12,300	2,400	12,800	1,600	13,900	2,000
Westminster Avenue/Springdale Street												
	10,000	2,700	10,000	2,800	12,100	2,400	12,300	2,300	12,700	2,100	13,300	2,300
Valley View Street/Bolsa Chica Road												
	9,500	2,600	9,500	2,800	10,900	2,300	11,100	2,300	12,100	2,000	12,000	2,300
SR-22 East												
	16,600	4,900	14,700	4,300	18,400	4,400	16,400	3,800	19,100	4,100	17,700	3,700
Seal Beach Boulevard												
	16,900	5,000	15,900	3,900	18,100	4,700	16,700	3,600	19,200	4,900	18,100	3,300
SR-22/7th Street												
	12,100	5,000	13,800	3,900	13,900	5,000	15,200	3,600	14,100	5,300	15,700	3,300
I-605												
	10,300	3,200	9,500	2,100	11,000	2,700	10,200	2,000	11,100	3,000	10,300	1,800

Note: Based on 35 percent of OCTAM peak period (6:00-9:00 A.M.) forecast. GP= general purpose lanes, HOV=Carpool lanes

I-405 Mainline PM Peak Hour Travel Demand Forecast for Year 2030

	Baseline				Alternative 1				Alternative 2			
Location on I-405	Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
	GP	HOV	GP	HOV	GP	HOV	GP	HOV	GP	HOV	GP	HOV
	11,200	2,700	10,800	2,800	11,900	2,700	11,100	2,800	12,000	2,800	11,300	3,000
SR-73												
	13,500	2,600	13,600	2,000	14,400	2,600	14,600	1,900	14,600	2,600	14,900	2,100
Fairview Street												
	13,500	2,600	14,300	2,000	14,400	2,600	15,300	1,900	14,600	2,600	15,600	2,100
Harbor Boulevard												
	14,100	2,600	12,400	2,200	15,500	2,500	13,300	2,200	16,000	2,500	13,800	2,100
Euclid Street/Ellis Avenue												
	12,800	2,600	10,500	2,200	13,600	2,500	11,900	2,200	14,700	2,500	13,000	2,100
Brookhurst Street/Talbert Avenue												
	11,500	2,800	9,900	2,500	13,300	2,400	11,400	2,000	14,300	2,200	12,500	1,900
Magnolia Street/Warner Avenue												
	11,900	2,200	9,900	2,500	13,500	2,100	11,900	2,200	14,800	2,000	13,100	2,100
Beach Boulevard/Edinger Avenue												
	11,300	2,500	10,100	2,600	13,400	2,100	12,200	2,100	14,400	2,000	12,700	1,900
Goldenwest Street/Bolsa Avenue												
	11,300	2,600	10,500	2,700	13,600	2,100	12,300	2,200	14,600	2,100	13,300	2,100
Westminster Avenue/Springdale Street												
	10,900	3,100	10,200	3,000	13,100	2,700	12,600	2,500	14,300	2,600	13,100	2,500
Valley View Street/Bolsa Chica Road												
	9,800	2,900	9,500	3,000	11,900	2,600	11,700	2,500	13,000	2,400	12,200	2,500
SR-22 East												
	16,300	5,000	16,700	5,300	17,800	4,500	18,400	4,800	19,200	4,200	19,600	4,600
Seal Beach Boulevard												
	15,700	5,200	18,100	4,200	17,400	4,900	19,600	4,200	18,400	4,900	20,300	4,000
SR-22/7th Street												
	12,100	5,800	15,700	4,200	13,300	5,300	17,000	4,200	13,900	5,300	17,600	4,000
I-605												
	9,600	3,000	11,500	2,300	10,500	2,800	12,200	2,400	10,600	2,800	12,300	2,500

Note: Based on 27 percent of OCTAM peak period (3:00-7:00 P.M.) forecast.GP= general purpose lanes, HOV=Carpool lanes

ATTACHMENT 10

PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT

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Interstate 405 Corridor Improvement Project

From State Route 73 to Interstate 605

ORANGE COUNTY, CALIFORNIA
12-ORA-405-PM 10.3/24.1
EA 0H100K

Preliminary Environmental Analysis Report

Prepared for

Orange County Transportation Authority

Prepared by

PARSONS

JULY 2008

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PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT

PROJECT INFORMATION

County Orange **Route** Interstate 405 **PM** 10.3/24.1

Project Title: Interstate 405 Corridor Improvement Project from State Route 73 to Interstate 605

OCTA Project Manager: Dan Phu Phone # (714) 560-5907

Consultant Design Manager: Kevin Haboian Phone # (949) 263-9322 x 228

Consultant Environmental Manager: Jeffery Bingham Phone # (949) 263-9322 x 229

Consultant Environmental Planner: Paul Melocoton Phone # (909) 919-2589 x 212

PROJECT DESCRIPTION

A. Purpose and Need

The purpose of the proposed project is to meet four primary objectives. The four primary objectives are to:

1. increase the capacity of the freeway to meet more of the existing and forecasted demand, increase peak period corridor speeds, and reduce peak period corridor travel times;
2. improve traffic operations on the freeway mainline;
3. enhance interchange operations; and
4. enhance safety.

The four primary objectives correspond to the four principal needs or problems identified in the discussion below.

First, demand currently exceeds capacity during peak periods, which results in travel delays (defined as level-of-service [LOS] E or F) along the corridor within the proposed project limits. Forecasted population and employment growth between the years 2005 and 2030 in the cities along I-405 in northern Orange County are expected to result in traffic growth of approximately 20 percent on I-405 within the proposed project limits, based on traffic forecasts from the Orange County Transportation Analysis Model (OCTAM).[1]

Travel times on I-405 between SR-73 and I-605 currently range from 13 minutes in free-flow conditions to 49 minutes during the most heavily congested times of day. Travel times are forecasted to increase to more than 60 minutes in year 2030 based on a traffic simulation analysis of the corridor prepared by OCTA. Average travel speeds during peak hours currently range from 17 to 35 miles per hour (mph) depending upon the direction of travel and time of day. Peak hour speeds are expected to degrade to a range of 13 to 19 mph in year 2030.

[1] The design year used for the PSR/PDS is 2030 as approved by the Project Development Team (PDT). The design year will be revised during the PA/ED process. OCTAM is expected to be updated to a forecast year of 2035 and be ready for use in the PA/ED phase. OCTAM forecasts will be adjusted to the appropriate design year during the PA/ED phase. Based on the current schedule, project completion is scheduled for year 2019, indicating a design year of 2039 for consideration in subsequent phases of project development. The design year used in the PA/ED phase of the project will be determined by the PDT in the initial stages of the PA/ED phase.

Second, operational problems occur on the freeway primarily because of physical bottlenecks. There are three locations in the corridor where general purpose lanes terminate. In the northbound direction, “lane drops” occur just north of the Fairview Road overcrossing (PM 11.0), at the Euclid Street interchange (PM 12.4), and at the Brookhurst Street interchange (PM 13.8). These latter two lane drops occur at interchanges that are adjacent to one another. The drop of three general purpose lanes in approximately 2.4 miles creates peak-period back ups of traffic that routinely extend through the SR-73 and SR-55 interchanges as far south as Jamboree Road (PM 6.92), which is a distance of nearly 7 miles.

Third, there are a variety of interchange and ramp deficiencies. Interchange ramps within the proposed project limits have limited storage capacity at ramp meters and signal-controlled off-ramps. Forecasted exit ramp traffic volume increases are expected to result in off-ramp queues from ramp/local street intersections that backup into the deceleration portion of freeway off-ramps at two locations: the I-405 northbound exit to Garden Grove Boulevard/Valley View Street/SR-22 Eastbound/Bolsa Chica Road and the I-405 southbound exit to Center Avenue at the Beach Boulevard interchange. There is inadequate storage at many metered on-ramp locations, which results in regular queues of vehicles entering the freeway backing onto local streets and, in some cases, across adjacent intersections. Beach Boulevard and Brookhurst Street have collector-distributor (C-D) roads with cloverleaf interchange configurations that require weaving of lower-speed traffic entering the C-D road from ramp meters with higher-speed traffic exiting the freeway. There is a nonstandard weaving length on the southbound freeway mainline between the Magnolia Street on-ramp and the Warner Avenue off-ramp.

Fourth, some existing geometric and operational deficiencies present potential safety concerns. Congestion on the freeway mainline resulting from demand that exceeds capacity, physical bottlenecks, interchange deficiencies, existing deficient weaving distances between ramps, and lack of storage capacity on ramps contribute to less than optimum safety conditions.

A secondary objective identified in the Project Study Report/Project Development Support (PSR/PDS) is to minimize the amount of right-of-way (ROW) acquisition needed for the project.

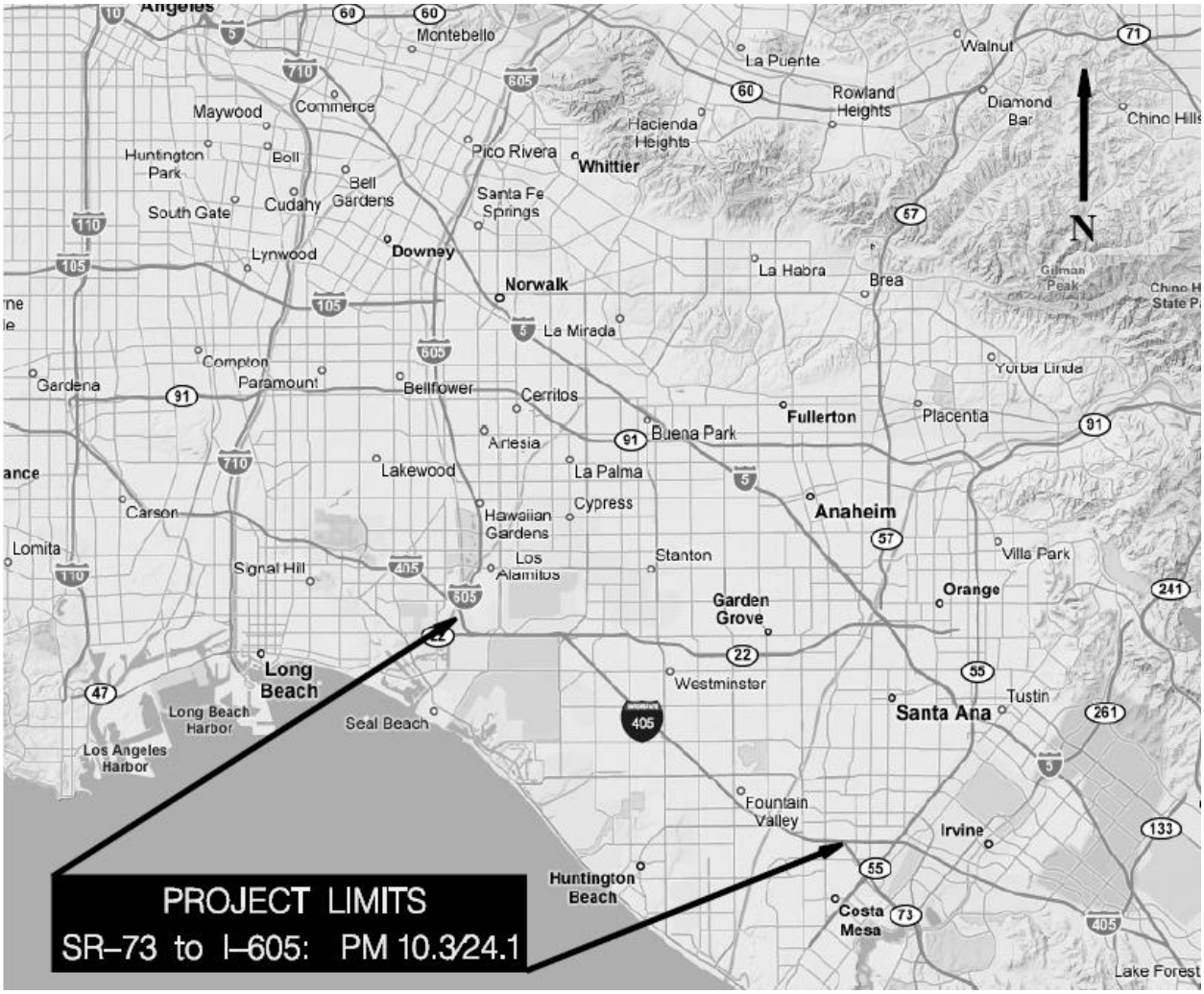
B. Description of Work

The Orange County Transportation Authority (OCTA), in conjunction with the California Department of Transportation (Caltrans), proposes to improve the Interstate 405 (I-405) corridor in northern Orange County. The proposed project would add general purpose lanes in each direction on I-405 between State Route 73 (SR-73) and Interstate 605 (I-605). Figure 1 shows the proposed project limits. Two build alternatives are being considered (see subsection C. Alternatives): 1) adding a single general purpose lane in each direction of I-405 from Euclid Street to the I-605 interchange, or 2) adding one general purpose lane in each direction of I-405 from Euclid Street to I-605 and two general purpose lanes northbound from Brookhurst Street to the State Route 22 (SR-22)/7th Street interchange and southbound from the Seal Beach Boulevard on-ramp to Brookhurst Street. The proposed project would provide other improvements, including auxiliary lanes between key interchanges and local interchange improvements as described below.

The local street interchanges along the corridor would be upgraded through reconfiguration and reconstruction to provide:

- inside and outside-side shoulders for on-/off-ramps;
- increased ramp storage capacity for on-/off-ramps;
- additional through and turn lanes at ramp intersections with local streets; and

Figure 1 – Project Location Map



- removal of high-occupancy vehicle (HOV) bypass lanes from on-ramps, subject to individual analysis of each on-ramp during the Project Approval/Environmental Document (PA/ED) phase and approval by the Caltrans and the Federal Highway Administration (FHWA).

Additionally, the proposed project would include the following interchange improvements:

- a new on-ramp from eastbound Ellis Avenue to southbound I-405;
- reconfiguration of the Brookhurst Street interchange;
- braided ramps in both directions at Magnolia Street/Warner Avenue;
- braided ramps in both directions at Beach Boulevard; and
- reconfiguration of the existing northbound off-ramp to eastbound Westminster Avenue.

The proposed project would require the replacement of 16 arterial overcrossings and one pedestrian overcrossing (17 total overcrossings) because their current spans are insufficient to accommodate additional lanes on the freeway beneath. One undercrossing and two railroad overheads would also require widening.

The following are other features and work that is incidental to the proposed project.

Utility Relocations

There are numerous utilities along the corridor of the proposed project, including some high risk utilities. There are high voltage power lines within the proposed project limits. More detailed design work in the PA/ED phase of the project will determine where these lines are in relation to traffic signal poles and Caltrans requirements for separation between them. Additional electrical service and additional transformers may be required for the proposed project, also to be determined in subsequent phases.

There are two gas pipelines in a 20 foot easement over land owned by the U.S. Navy. The easement parallels and abuts the freeway ROW between Seal Beach Boulevard and Bolsa Chica Road. OCTA is planning to acquire the easement from the U.S. Navy as part of the SR-22 West County Connectors project, which is currently in the Plans, Specifications, and Estimates (PS&E) phase. Under that project the two gas pipelines would remain in their current locations. The pipelines would be relocated as part of the I-405 widening.

Soundwalls

Soundwalls exist intermittently within the proposed project limits. A general survey of these barriers indicates that they are mostly concentrated in areas adjacent to single-family residences; however, several potentially sensitive land uses are not protected by soundwalls and these are discussed in Section 6 of this Preliminary Environmental Analysis Report (PEAR). Generally the areas considered for soundwalls are those with residential property abutting or nearby the freeway. In many locations sound and/or retaining walls are proposed at the edge of the ROW to minimize acquisitions. At locations with cross sections narrower than the ROW, offsets will be assessed during the PA/ED phase of project development.

Bridge Widening and Replacement

The addition of one general purpose lane in each direction would require bridge widening and replacement. The Euclid Street/Ellis Avenue undercrossing bridge and the two railroad overheads within the project limits would require widening. The pedestrian bridge over I-405 near Heil Avenue would require replacement. Addition of two general purpose lanes in each direction (see subsection C. Alternatives) may required other bridge widenings and replacements, which will be determined in the PA/ED phase of the project.

Landscaping

A Replacement Highway Planting Project, distinct from the roadway construction project, is planned for provision of landscaping along the corridor. Because roadway construction is envisioned from edge of ROW to edge of ROW along much of the freeway mainline, landscaping will be most prevalent at interchanges.

Dewatering

It is anticipated that this project will require dewatering, and coverage must be obtained under Order No. R8-2003-0061, *General Waste Discharge Requirements for Discharges to Surface Waters which Pose an Insignificant (De Minimus) Threat to Water Quality*. Assuming dewatering will be required, site-specific groundwater contamination data will be needed to

evaluate proper methods to manage and dispose of groundwater that might be removed during construction.

Right-of-Way

The ROW required for this project lies within the cities of Seal Beach, Westminster, Huntington Beach, Fountain Valley, and Costa Mesa. A clearance envelop extending at least 15 feet outboard of the two railroad overheads to be widened by the proposed project (see below) would also be acquired by easement or license. Final determinations regarding acquisitions for the project will be determined during subsequent phases of project development.

Railroads

The two aforementioned railroad overheads within the project limits passes over the Union Pacific Railroad (UPRR) on the Bolsa Overhead (Bridge No. 55-269 at PM 17.21) and the U.S. Navy Railroad on the Navy Overhead (Bridge No. 55-272 at PM 18.36). Both overheads would be widened to accommodate the proposed freeway widening. Required railroad clearances would be maintained and a crash cushion installed at the UPRR overhead.

C. Alternatives

The OCTA Board of Directors adopted a locally preferred strategy (LPS) on October 14, 2005, as the culmination of the Major Investment Study (MIS) conducted for the I-405 corridor. Thirteen alternatives were developed and evaluated as part of the MIS process. The *I-405 Major Investment Study Final Report* (February 2006) states (page 93): “It is clear from the process used to identify Alternative 4 as the LPS that the selection of Alternative 4 was predicated upon a balance between its benefits and its impacts, *especially its ROW impacts*.” The preceding pages of that report (page 85, et seq.) document the process used to select the LPS, and those pages have numerous references to concerns with minimizing ROW impacts. It was clear to participants in the process that any alternative requiring extensive ROW acquisitions would face higher local and public opposition and controversy. The OCTA Board indicated that other alternatives with similar or fewer ROW impacts should be considered in the project development process.

In addition to the No Build Alternative, two build alternatives are included in the PSR/PDS. Alternative 1 would add a single general purpose freeway lane in each direction and Alternative 2 would add two general purpose freeway lanes in each direction.

Build Alternative 1: Add One General Purpose Lane

Build Alternative 1 would add a single general purpose freeway lane in each direction of I-405 from Euclid Street to the I-605 interchange. Auxiliary lanes would be provided between interchanges in several locations. A more detailed description of the alternative, including the locations of auxiliary lanes, is provided in Section 6.2 of the PSR/PDS. Build Alternative 1 would include standard width lanes and shoulders. Improvements at each interchange within the project limits are proposed. Due to the added travel lanes and shoulder widths on the freeway proposed under Build Alternative 1, 17 overcrossings would require replacement. In addition, one undercrossing and two railroad overheads would require widening. Additionally, bridge widening would also be required to accommodate Build Alternative 1 over five surface water crossings. Table 1 provides the location of these surface water crossing improvements and a summary of the expected work. Four additional bridges, included as part of the SR-22 WCC project, are currently being designed to accommodate Build Alternative 1.

Build Alternative 1 would include a set of Transportation System Management (TSM) and Transportation Demand Management (TDM) components, such as park-and-ride facilities and Intelligent Transportation System (ITS) elements. The locations of park-and-ride facilities will be determined during the PA/ED phase of the project, when consideration will be given to the use of excess lands resulting from proposed interchange reconfigurations as well as other available unused ROW. Other locations outside the ROW may also be considered.

Build Alternative 2: Add Two General Purpose Lanes

Build Alternative 2 would add one general purpose lane in each direction as in Build Alternative 1, plus a second lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street. Other features of Build Alternative 2 are similar to Build Alternative 1, except for some differences in the locations of auxiliary lanes specified in Section 6.3 of the PSR/PDS.

Table 1
Surface Water Crossing Improvements

Approximate Post Mile	Waterbody	Proposed Work near Waterbody
12.4	Santa Ana River	Would require placement of bridge piers within the channel.
12.9	East Fountain Valley Channel	Lengthen the existing reinforced concrete box (RCB) on both sides of I-405, which would involve working in the channel.
14.9	Ocean View Channel	Lengthen the existing RCB on the northbound side of I-405, which would involve working in the channel.
15.5	Heil Avenue Storm Drain	Lengthen the existing RCB on both sides of I-405, which would involve working in the channel.
15.9	East Garden Grove-Wintersburg Channel	Lengthen the existing RCB on both sides of I-405, which would involve working in the channel.

ANTICIPATED ENVIRONMENTAL APPROVAL

CEQA	NEPA
☐ Categorical/Statutory Exemption	☐ Categorical Exclusion
☐ Negative Declaration	☐ Finding of No Significant Impact
☒ Environmental Impact Report	☒ Environmental Impact Statement

An Environmental Impact Report (EIR) pursuant to CEQA and an Environmental Impact Statement (EIS) pursuant to NEPA will be required. It is estimated that the EIR/EIS approval of the I-405 Corridor Improvement Project will require 36 months for completion. Caltrans District 12 will be the Lead Agency for CEQA and NEPA; NEPA authority is assigned in accordance with Section 6005 of SAFETEA-LU (U.S.C. 327[a][2][A]).

SUMMARY STATEMENT

The preliminary environmental investigation of the proposed project is focused on potential impacts from the two build alternatives along the I-405 corridor. Impacts may occur to the following resources: community, farmlands, visual, water quality, floodplains, noise, air quality, cultural resources, Sections 4(f) and 6(f), hazardous waste/materials, utilities and services, and transportation/traffic. The project may also result in temporary, secondary, and/or cumulative impacts.

The proposed improvements could result in significant impacts. In consideration of the scope of the project, and specifically the number of properties that could potentially be affected, the magnitude of construction activities and the complexity of the project, involving a broad range of impacts to various environmental resources, an EIR pursuant to CEQA and an EIS pursuant to NEPA will be required. It is estimated that the EIR/EIS approval of the I-405 Corridor Improvement Project will require 36 months for completion. Caltrans District 12 will be the Lead Agency for CEQA and NEPA; NEPA authority is assigned in accordance with Section 6005 of SAFETEA-LU (U.S.C. 327[a][2][A]).

Preparation of the following technical studies is recommended to assess the impacts of the project and to develop feasible avoidance, minimization, or mitigation measures. The anticipated time durations for preparation of each technical study is shown in parentheses.

- Community Impact Assessment (6 months)
- Relocation Impact Report (6 months)
- Visual Impact Assessment (9 months)
- Water Quality Assessment Report (3 months)
- Summary Floodplain Encroachment Report or Floodplain Evaluation Report (3 months)
- Traffic Noise Study Report/Noise Abatement Decision Report (NADR) (9 months)
- Air Quality Report (4 months)
- Cultural Resources Studies (Historic Property Survey Report; Historic Resource Evaluation Report; and Archaeological Survey Report) (5 months)
- Sections 4(f) and 6(f) Evaluation (2 months)
- Initial Site Assessment – Update (9 month)
- Natural Environment Study (9 months)
- Traffic Impacts/Circulation Study (12 months)

The following special considerations could affect the environmental approval schedule and/or the issues to be analyzed in detail:

- The process for the acquisition of ROW and business and residential relocations could affect the project schedule. The acquisition of several parcels, especially properties that may require condemnation through the eminent domain processes, may result in delays.
- Potential public opposition to the project could affect the project schedule, especially during the environmental document review phase. Community controversy could result from proposed ROW acquisition and relocations, as well as temporary construction impacts, such as lane and ramp closures in an already congested corridor and reconstruction of soundwalls to accommodate the I-405 widening. Higher-level public outreach efforts, such as additional open house meetings/workshops, notices, and extended review/comment periods, will be implemented to address any public controversy.

It is estimated that the EIR/EIS approval for the I-405 Corridor Improvement Project will require 36 months to complete the identified tasks in this PEAR, and additional tasks which will likely emerge during the PA/ED process.

The following is a brief summary of key environmental issues for each practicable build alternative.

Build Alternative 1

Addition of one general purpose lane in each direction of I-405 from Euclid Street to I-605 and auxiliary lanes between key interchanges would add capacity to the freeway and improve operations. This alternative would result in higher freeway average daily traffic (ADT) through the corridor, than under the No Build Alternative, thereby necessitating studies of air and noise emissions. Additional impacts would include temporary and permanent property easements, and in some cases ROW relocations; replacement of 17 overcrossings and related visual and traffic impacts; additional impervious surfaces increasing stormwater runoff; and bridge widenings over 5 surface water crossings involving temporary and permanent placement of fill in waters of the U.S.

Build Alternative 2

Addition of one general purpose lane in each direction of I-405 from Euclid Street to I-605 and addition of a second general purpose lane northbound from Brookhurst Street to the SR-22/7th Street interchange and southbound from the Seal Beach Boulevard on-ramp to Brookhurst Street, as well as auxiliary lanes between key interchanges, would add more freeway capacity than Build Alternative 1 and improve freeway operations. Alternative 2 would require replacement of the same 17 overcrossings as Alternative 1, with related visual and traffic impacts. This alternative would result in higher freeway ADT through the corridor than the No Build Alternative and Build Alternative 1, thereby necessitating studies of air and noise emissions. Build Alternative 2 would have substantially greater impacts than Build Alternative 1 in the areas of: ROW impacts and relocations; impervious surfaces increasing stormwater runoff; and bridge widenings over 5 surface water crossings involving temporary and permanent placement of fill in waters of the U.S. Build Alternative 2 would also require additional and higher retaining walls than Build Alternative 1, resulting in potential visual impacts; it would reduce the vehicle miles traveled on local streets by redistributing traffic to the widened freeway, however this redistribution would result in additional traffic on those arterials with interchanges to the freeway.; it would require more demolition and replacement of existing soundwalls; and there would be less available ROW, limiting opportunities for freeway landscaping.

soundwalls; and there would be less available ROW, limiting opportunities for freeway landscaping.

DISCLAIMER

This report is not an environmental document, nor is it an official Caltrans project initiation document. Preliminary analysis and determinations are based on the project description provided in this report. The estimates and conclusions provided are approximate and are based on cursory analysis of probable effects. Changes in project scope, alternatives, or environmental laws will require updating of this report.

REVIEWED BY

per Leslie Vandersteel

Environmental Branch Chief, Smita Deshpande

Date: 7/17/08

Dan M

OCTA Project Manager, Dan Phu

Date: July 16, 2008

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Environmental Technical Reports or Studies Required

	Study/ Report	Document Text Only	Not Anticipated
Community Impact Study	☒	☐	☐
Farmland	☐	☒	☐
Section 4(f) Evaluation	☒	☐	☐
Visual Resources	☒	☐	☐
Water Quality	☒	☐	☐
Floodplain Evaluation	☒	☐	☐
Noise Study	☒	☐	☐
Air Quality Study	☒	☐	☐
Paleontology	☐	☒	☐
Cumulative Impacts	☐	☒	☐
Cultural			
ASR	☒	☐	☐
HSR	☐	☐	☒
HRCR	☐	☐	☒
HPSR	☒	☐	☐
Section 106/SHPO	☐	☒	☐
Native American Coordination	☐	☒	☐
Other: HRER	☒	☐	☐
_____	☐	☐	☐
Hazardous Waste			
ISA (Additional)	☒	☐	☐
PSA	☒	☐	☐
Biological			
Endangered Species (Federal) _____	☐	☐	☒
Endangered Species (State) _____	☐	☐	☒
Biological Opinion/USFWS	☐	☐	☒
Wetlands	☒	☐	☐
Natural Environment Study	☒	☐	☐
Biological Assessment	☐	☐	☒
NEPA 404 Coordination	☐	☒	☐
Permits			
401 Permit Coordination	☐	☒	☐
404 Permit Coordination _____	☐	☒	☐
1602 Permit Coordination	☐	☒	☐
City/County Coastal Permit Coordination	☐	☐	☒
State Coastal Permit Coordination	☐	☐	☒
NPDES Coordination	☐	☒	☐
US Coast Guard (Section 10)	☐	☐	☒
SARWQCB Dewatering Permit	☐	☒	☐

DISCUSSION OF TECHNICAL REVIEW

1. COMMUNITY IMPACTS

1.1 Existing Social and Economic Conditions

The project limits traverse the cities of Costa Mesa, Fountain Valley, Westminster, Huntington Beach, Garden Grove, Seal Beach, and the community of Rossmoor within Orange County; these cities and communities, and especially areas adjacent to I-405 are considered highly urbanized. Various land uses occur along the corridor, including industrial, residential, commercial, schools, parks, and other public facilities, such as drainage channels.

The socioeconomic characteristics of the surrounding communities are characterized using 2000 U.S. Census data. Table 2 provides the racial and ethnic profile of the U.S. Census tracts[2] that intersect the project study area, along with the racial and ethnic profile for Orange County, to provide a comparison with the demographics of the region. The project limits were found to traverse 25 census tracts.

Table 2
Racial and Ethnic Composition

Race/Ethnicity	Project Area[1]		Orange County	
	Number	Percent	Number	Percent
Total Population	111,987	100	2,846,289	100
White	63,854	57.0	1,458,978	51.2
Black or African American	1,541	1.2	42,639	1.5
American Indian & Alaska Native	347	0.3	8,414	0.3
Asian	23,684	21.0	383,810	13.5
Native Hawaiian & Other Pacific Islander	385	0.3	8,086	0.3
Some other race	200	0.2	4,525	0.2
Two or more races	3,263	3.0	64,258	2.3
Hispanic or Latino (any race)	18,713	17.0	875,579	30.7

[1] Based on analysis of 25 census tracts in the I-405 corridor.

Source: U.S. Census, 2000.

The largest racial/ethnic group in both demographic areas is white, comprising more than half of each respective population at 57 percent. The next two largest populations in the project area are the “Hispanic or Latino”, followed by the Asian, at 30.7% and 13.5%, respectively.

According to 2000 U.S. Census data, the approximate average household size in Orange County and the census tracts examined for this project is three persons. Federal poverty thresholds for 2007 establish $17,170 as the income threshold for a 3-person household (HHS, 2008). Based on these data, approximately 10 percent of the population within the census tracts examined live below the poverty line, as opposed to 5 percent in Orange County.

[2] Census Tract (CT) 638.05; CT 639.02; CT 639.03; CT 639.07; CT 639.08; CT 992.29; CT 992.30; CT 992.50; CT 992.51; CT 992.24; CT 992.34; CT 992.41; CT 996.01; CT 996.02; CT 996.05; CT 997.01; CT 997.02; CT 997.03; CT 995.02; CT 995.09; CT 999.02; CT 99.05; CT 999.06; CT 1100.08; CT 1100.12

1.2 Existing Facilities

Various land uses and structures, including single family homes, multiple family dwellings including an assisted living residence for seniors, and office and industrial complexes, are located immediately adjacent to I-405.

Commercial facilities include office complexes, major retail outlets and shopping malls, and a family entertainment center. Industrial facilities include the Don De Cristo Concrete facility, located just north of McFadden Avenue, and The All American Asphalt facility, located near Edwards Street just off southbound I-405. A total of 277 parcels were identified adjacent to the proposed project segment.

1.3 Potential Community Impacts

1.3.1 Environmental Justice

Using data collected from 25 census tracts examined for this project, potential environmental justice populations in the project area were identified if: 1) a census tract has a minority population greater than the average minority population for the 25 census tracts examined, or 2) the percentage of the population living below the poverty line is greater than the average percentage of the population living below the poverty line in the 25 census tracts examined.

Three census tracts that meet these criteria were identified to have a minority and/or low-income environmental justice population are located in the I-405 corridor. These are census tracts 995.09, 996.01, and 639.02. These tracts are located in Seal Beach north of Westminster Boulevard, Westminster north and south of I-405 between Knott and Magnolia Streets, and in Costa Mesa south of I-405 between Harbor Boulevard and Fairview Road, respectively.

1.3.2 Right of Way Acquisition and Relocation

Depending on the build alternative considered, the proposed improvements would require acquisition of ROW and/or temporary construction easements from various land uses adjacent to the corridor, including single-family residential, multiple-family dwelling, commercial, industrial, public parks, and existing public facilities. Public facilities include properties containing infrastructure facilities, such as drainage channels and local roads, municipal water supply facilities, and sewage treatment facilities. Any ROW acquisitions for the proposed project would be implemented in conformance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970.

Temporary easements that would be required from various land uses along the project corridor are required to accommodate the construction of potential new soundwalls and retaining walls, or allow modification of existing soundwalls. Relocations or demolition of existing buildings are not expected during the use of these temporary construction easement areas.

Table 3 provides a summary of potential ROW impacts of Build Alternative 1. Preliminary ROW analysis indicates that Build Alternative 1 will require acquisition and/or temporary easements from several parcels. Full acquisition of some parcels with existing homes and other buildings is likely, but cannot be precisely determined at the current level of conceptual design. More precise determination of potential ROW acquisitions and temporary easements will be made during the PA/ED phase and other subsequent phases of project development.

Table 3
Anticipated ROW Impacts on Land Use Type
Build Alternative 1

Land Use	Number of Parcels[1]	
	Acquisition[2]	Temporary Easements
Single-Family Residential	5	227
Multiple-Family Dwelling	1	5
Commercial	18	18
Industrial	2	14
Public Facilities[3]	6	12
School Grounds	0	1
Public Parks	0	0

[1] In some cases, an acquisition and a temporary easement may be required from the same parcel.
[2] Whether an acquisition will be full or partial will be determined during subsequent phases of project development.
[3] Public facilities include drainage channel areas, channel maintenance access areas, local roads, municipal water supply facilities, and sewage treatment facilities.

Table 4 provides a summary of the potential ROW impacts of Build Alternative 2. Preliminary ROW analysis indicates that Build Alternative 2 will require acquisition and/or temporary easements from several parcels. Full acquisition of some parcels with existing homes and other buildings is likely, but cannot be precisely determined at the current level of conceptual design. More precise determination of potential ROW acquisitions and temporary easements will be made during the PA/ED phase and other subsequent phases of project development.

Table 4
Anticipated ROW Impacts on Land Use Type
Build Alternative 2

Land Use	Number of Parcels[1]	
	Acquisitions[2]	Temporary Easements
Single-Family Residential	86	245
Multiple-Family Dwelling	3	6
Commercial	23	19
Industrial	5	15
Public Facilities[3]	13	13
School Grounds	0	1
Public Parks	1	0
Seal Beach Naval Weapons Station	1	0

[1] In some cases, an acquisition and a temporary easement may be required from the same parcel.
[2] Whether an acquisition will be full or partial will be determined during subsequent phases of project development.
[3] Public facilities include drainage channel areas, channel maintenance access areas, local roads, municipal water supply facilities, sewage treatment facilities, and a post office.

Full acquisition of existing structures/units would result if all or a substantial portion of a property was within the potential ROW, rendering it uninhabitable or economically unviable. Commercial or industrial buildings could be salvaged if only a portion of the structure must be demolished to accommodate the project, and the use can remain economically viable.

Build Alternative 2 would also likely require ROW from the Seal Beach Naval Weapons Station. The Navy may require additional mitigation of impacts to the military function of this land.

Due to the urbanized nature of the areas along the I-405 corridor, replacement housing and comparable commercial sites in areas where displacement would likely occur are assumed available. Replacement sites for industrial facilities may be difficult to find in the displacement area. Adequacy of the displacement area for relocation will be analyzed in a Relocation Impact Report.

1.3.3 Community Character and Cohesion

I-405 acts as a physical barrier dividing portions of the cities of Costa Mesa, Fountain Valley, Westminster, Huntington Beach, and Seal Beach. Widening the freeway would not create a new barrier or further impede community cohesion. Impacts on community cohesion could result if the project results in a decrease in mobility in local communities and neighborhoods; this may be the case during prolonged temporary closures of local streets during construction or construction of cul-de-sacs as part of local street improvements.

1.3.4 Public Facilities and Services

The proposed project is located adjacent to various public facilities, which include drainage/storm channels, public parks, and schools. Public parks and schools located adjacent to I-405 consist of the following:

- Santa Ana River Trail
- Cascade Park
- College Park
- Gisler Park
- Pleasant View Park
- Los Alamos Park
- Fountain Valley High School

Based on estimates for Build Alternative 1 direct uses of public parks or schools are not anticipated. However, Build Alternative 2 may result in acquisitions from public parks. Because of the potential for direct or constructive use of public parks, and since several parks are located in the vicinity of the project, a Section 4(f) evaluation is recommended.

Direct or temporary impacts may result to utilities and service systems. Utility systems that are either adjacent to I-405 or that traverse the proposed project, and could potentially be affected, have been identified in a preliminary utility investigation completed for the project. Potentially affected utilities occur throughout the I-405 corridor and include underground and overhead power transmission lines (including high-voltage overhead lines); gas, water and oil pipelines; and fiber optic lines.

Potential impacts to utilities and service systems will be identified during the PA/ED and PS&E phases of the project, and appropriate mitigation measures will be defined in conjunction with each affected utility company. If utility relocations are necessary, then areas where the

relocation would occur should be evaluated as part of the project. Measures to minimize utility service disruptions should be implemented to minimize impacts to the community.

Temporary impacts to public services could also occur during construction of the proposed project by way of delayed service response times. Coordination and communication with each potentially affected emergency service would reduce potential impacts during construction. Since the project would reduce congestion along I-405 and on local streets, the project would result in a beneficial effect to these services.

The Community Impact Assessment (CIA) should discuss ROW relocation in a Relocation Impact Report, environmental justice impacts, community character and cohesion, socioeconomic factors, and impacts to public facilities and services.

2. FARMLANDS

2.1 Existing Agricultural Setting

The project corridor crosses a highly urbanized area of Orange County, with little open space and few opportunities for agricultural use. The northern portion of I-405 is adjacent to the U.S. Naval Weapons Station in Seal Beach between Seal Beach Boulevard and Old Bolsa Chica Road; portions of the Naval Weapons Station are currently used for agricultural purposes. Although the principal use of the land is military, these farmlands have been designated as Prime Farmlands (County of Orange, 2004).

Agricultural preserve lands, as defined by the California Land Conservation Act (Williamson Act), are not located in the project area.

2.2 Potential Farmland Impacts

Since the project may potentially result in some land acquisition along the Seal Beach Naval Station with Build Alternative 2, further analysis to determine if Prime Farmlands occur in the affected area is recommended during the PA/ED phase. Coordination with the National Resource Conservation Service (NRCS) and the California Department of Conservation – Division of Land Resources Protection (DLRP) is recommended to determine if Prime Farmlands occur in the project area adjacent to I-405.

3. VISUAL EFFECTS

3.1 Existing Visual Environment and Scenic Resources

The project freeway segment is not designated a scenic highway, nor is the project located within or in the vicinity of a scenic resource. Sensitive receptors in the project area consist of residences along I-405 and frequent commuters, as well as users of public parks.

3.2 Potential Visual Impacts

The general widening of I-405 would not likely result in a substantial change in the aesthetics of the project corridor in comparison to the existing condition, but it may cause visual and aesthetic impacts to adjacent residences and other sensitive land uses. These changes could be as a result of the construction of new soundwalls or the relocation/modification of existing soundwalls, improvements to interchanges and overcrossings, or modification of existing highway facilities such as overhead signs or street lighting. These improvements could block

important views from residences or other sensitive land uses such as parks. It could also result in increased shading of areas, concrete structures, and increased glare from freeway lighting.

4. WATER QUALITY AND EROSION

4.1 Existing Watersheds and Surface Water Resources

The project crosses three watersheds: Santa Ana River watershed, Talbert watershed, and Westminster watershed. Within these three watersheds, the project crosses nine water bodies: Santa Ana River, East Fountain Valley Channel, Ocean View Channel, Heil Avenue Storm Drain, East Garden Grove-Wintersburg Channel, Westminster Channel, Anaheim-Barber City Channel, Bolsa Chica Channel, and the Montecito Storm Channel.

The corridor also crosses smaller drainages and may impact other drainages due to their proximity. Most of these drainages within the study area are concrete-lined and are under the jurisdiction of the Orange County Flood Control District, United State Army Corps of Engineers (USACE), or Santa Ana Regional Water Quality Control Board (SARWQCB). Coordination with the Los Angeles RWQCB may be required if there is a potential to affect the San Gabriel Watershed.

4.1.1 Basin Plans and Water Quality Standards

Water resources along the project area are under the jurisdiction of SARWQCB. The project crosses two Watershed Management Areas (WMA), all of which are within the Santa Ana Basin:

- Anaheim Bay, Huntington Harbor, and Bolsa Chica WMA
- Lower Santa Ana River WMA

The southern limit of the project study area is the interchange of I-405 and SR-73 (PM 10.3); according to the latest map of the Newport Bay WMA, neither the I-405/SR-73 interchange nor any portion of I-405 north of SR-73 is within the Newport Bay WMA limits. During the PA/ED phase of the project, the project drainage design should be evaluated to assess whether there are any downstream effects to the Newport Bay WMA.

A water quality control program has been established for each WMA, as well as a regionwide water quality control program. These programs establish Total Daily Maximum Loads (TDMLs) for each WMA, which are allowable pollutant loading from all contributing sources. These water quality objectives are intended to provide reasonable water quality protection for the beneficial uses listed for each water body.

Several 303d listed or “impaired waters” are found either within or downstream from the project area. These 303d listed resources include Huntington Beach State Park, Huntington Harbor, Newport Bay, and Seal Beach.

4.2 Potential Water Quality Impacts

Bridge widening would be required to accommodate the proposed project over five surface water crossings. Table 5 provides the location of these surface water crossing improvements and a summary of the expected work.

Table 5
Surface Water Crossing Improvements

Approximate Post Mile	Waterbody	Proposed Work near Waterbody
12.4	Santa Ana River	Would require placement of bridge piers within the channel.
12.9	East Fountain Valley Channel	Lengthen the existing reinforced concrete box (RCB) on both sides of I-405, which would involve working in the channel.
14.9	Ocean View Channel	Lengthen the existing RCB on the northbound side of I-405, which would involve working in the channel.
15.5	Heil Avenue Storm Drain	Lengthen the existing RCB on both sides of I-405, which would involve working in the channel.
15.9	East Garden Grove-Wintersburg Channel	Lengthen the existing RCB on both sides of I-405, which would involve working in the channel.

Runoff from the existing I-405 roadway surface is a potential source of pollutants. The addition of lanes proposed by the project would increase impervious surface area, which would result in an incremental increase in stormwater runoff. Given the urbanized nature of the study area, this additional increase is not anticipated to be substantial relative to the total amount of runoff from other developed areas; however, it is anticipated to result in a potential increase in pollutants. Increases in specific pollutants may result in a variance from a TDML, depending on the WMA.

The proposed project could also result in water quality impacts to stormwater runoff during construction activities. Construction would be conducted in accordance with all applicable water quality requirements of the Section 401 permit issued by SARWQCB and the provisions of the NPDES General Permit for Construction Activities. Implementation of Best Management Practices (BMPs) would minimize erosion of exposed soils and resultant sediment and surface contaminant loading into the storm drain system and downstream water bodies. Consequently, the proposed improvements are not expected to violate water quality or waste discharge standards. Stormwater BMPs would be applied to control pollutants from highway runoff. Operational impacts would be minimized by implementation of Caltrans-approved Treatment BMPs, as outlined in the Caltrans Project Planning and Design Guide.

Because the project is located within Caltrans ROW, conformity with the Caltrans Statewide NPDES Permit would be required. Procedures and facilities would be incorporated into the proposed design of the build alternatives, as necessary, to control additional runoff. With incorporation of mitigation, the additional runoff created by the proposed improvements would not be expected to exceed the capacity of available stormwater drainage systems.

It is anticipated that this project will require dewatering, and coverage must be obtained under Order No. R8-2003-0061, *General Waste Discharge Requirements for Discharges to Surface Waters which Pose an Insignificant (De Minimus) Threat to Water Quality*. Assuming dewatering will be required, site-specific groundwater contamination data will be needed to evaluate proper methods to manage and dispose of groundwater that might be removed during construction. Dewatering groundwater free of pollutants must be authorized under a regional dewatering NPDES permit. Dewatering any water containing pollutants cannot be discharged to a water of the U.S. or storm drain without specific authorization from the SARWQCB.

A Storm Water Data Report (SWDR) will be required. A Storm Water Pollution Prevention Plan (SWPPP) should be prepared since it is likely that the project will have a potentially large

disturbance area (greater than one acre). Coordination with SARWQCB is recommended during preparation of the Water Quality Assessment and the EIR/EIS to facilitate project approval.

5. FLOODPLAIN

5.1 Existing Hydrology Setting

Based on a review of the latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), most of the project alignment is not located within a base floodplain zone as defined by FEMA. The base floodplain zones that traverse the project segment occur within existing concrete-lined waterways/floodways. Table 6 lists the floodways that cross the project segment.

Table 6
Existing Floodways in the Project Area

Naval Weapons Station Flood Control Channel
East Fountain Valley Channel
Ocean View Channel
Heil Avenue Storm Drain
East Garden Grove-Wintersburg Channel
Westminster Channel
Anaheim Barber City Channel
Bolsa Chica Channel

Since the project area is heavily urbanized, and since drainage facilities exist to accommodate offsite water flows, flooding caused by sheet-flow type conditions are not expected to occur.

5.2 Potential Floodplain Impacts

Floodplain impacts and an increase risk in flooding as a result of the project are not expected. Based on preliminary design, work is expected to occur within some of the concrete-lined floodways that cross the project freeway segment. Changes to the hydraulic characteristics of each floodway and temporary construction work within these channels would be designed to the standards of the Orange County Flood Control District and FEMA. A bridge hydrology report will be prepared and will identify measures to prevent any substantial increases in surface water elevations in each channel.

When there is encroachment on a floodway, it is required that a Conditional Letter of Map Revision (LOMR) be completed and submitted to FEMA during the design phase of the project. The preparation of a Location Hydraulic Study is recommended to determine if there is an increase in the base floodplain as a result of the proposed improvements. If there are minimal or no impacts, then a Summary Floodplain Encroachment Report would be completed. If there were substantial encroachment, then a Floodplain Evaluation Report would be necessary. Flood control measures would be incorporated into the design to prevent any substantive increases in water surface elevations. Coordination with FEMA is recommended throughout the design and construction processes to verify the need for and expedite the processing of the LOMRs. Coordination with the Orange County Flood Control District is recommended during the design and construction processes to expedite project approval and minimize impacts to the floodways.

6. NOISE

6.1 Project Setting and Sensitive Receptors

Soundwalls exist intermittently along the entire project freeway segment. A general survey of these barriers indicates that they are mostly concentrated in areas adjacent to single-family residences; however, several sensitive land uses are not protected by soundwalls. On the northbound side of the freeway, these sensitive land uses include Westminster High School at Edwards Street; residences at the Beach Boulevard interchange; apartments at the Magnolia Street interchange; a hotel at Slater Avenue; and a hotel at Euclid Street. Sensitive land uses along the southbound side of I-405 not currently protected by a barrier include a playground at Westminster Boulevard; apartments at the Bolsa Avenue interchange; apartments at the Beach Boulevard interchange; residences at the Edinger Avenue interchange; a hotel at Magnolia Street; residences at the Warner Avenue interchange; a closed school currently being used as a park at Warner Avenue; and residences at the Talbert Avenue interchange.

6.2 Potential Noise Impacts

The proposed project would result in higher freeway ADT through the corridor, than under the No Build Alternative, thereby necessitating the study of noise abatement. It is anticipated the proposed alternatives would result in a permanent increase in freeway noise levels due to additional traffic lanes and related volumes, and changes in roadway geometry. Elevated noise levels would also be experienced during construction activities. Residences adjacent to the freeway would be particularly sensitive to increases in noise levels.

New soundwalls may be constructed to attenuate the increase in traffic noise. Some existing soundwalls may be removed to accommodate the proposed widening of the freeway, but they would be replaced if found reasonable and feasible in the traffic noise study. Determination of where new soundwalls would be constructed will be made during the PA/ED phase based on the traffic noise study report.

7. AIR QUALITY

7.1 Project Setting and Air Quality Standards

The project area is located in the South Coast Air Basin (SCAB) and is under the jurisdiction of the SCAQMD. The 1990 Clean Air Act (CAA) designated the SCAB as follows: “extreme” for 1-hour ozone (O_3), requiring attainment with the federal O_3 standard by 2010; “Severe – 17” for 8-hour O_3, requiring attainment with the federal O_3 standard by 2021, “serious” for particulate matter less than 10 microns in diameter (PM_{10}), requiring attainment with federal standards by 2006, “Nonattainment” for carbon monoxide (CO), and “Nonattainment” for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), with attainment likely by 2014.

In 2007, the United States Environmental Protection Agency (EPA) re-designated the SCAB as an attainment area for CO and approved a revision in the State Implementation Plan (SIP) for the SCAB as meeting the CAA requirements for the maintenance plan for CO.

7.2 Potential Air Quality Impacts

The proposed project would result in higher freeway ADT through the corridor, than under the No Build Alternative, thereby necessitating study of air emissions. Potential improvements to the I-405 corridor would be designed to reduce congestion and improve traffic flow in the study area; thus, the improvements should yield air quality benefits. The proposed project

improvements would also have to be included in a future conforming Regional Transportation Improvement Program and Regional Transportation Plan; therefore, the project would not conflict with the applicable air quality management programs and plans for the area, though it is likely that construction activities could produce temporary emissions in excess of established standards. Air quality impacts associated with construction activities would be temporary and would be minimized by compliance with SCAQMD requirements.

Structures, including bridges and buildings, would be demolished under both build alternatives; therefore, there is the risk of structural asbestos being released into the air.

If the preferred alternative involves demolition of structures, then the structures would be evaluated for Asbestos Containing Material (ACM) and, if present, this material would be contained during demolition to avoid release of airborne asbestos. Coordination with the Transportation Conformity Working Group (TCWG) is recommended to assess conformity for particulate matter. This coordination will determine whether the proposed project is a "Project of Air Quality Concern."

8. CULTURAL RESOURCES

8.1 Project Setting and Sensitivity to Resources

A search of the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center located at California State University at Fullerton yielded information pertaining to potential historic and archaeological sites within 1-mile from the project limits. Sixteen archaeological sites were identified within this area. Of these 16, Site 113 is located in Westminster within freeway ROW and could potentially be impacted by both build alternatives. The site was recorded as having a midden containing shells, choppers, scrapers, and bone.

Because of the urbanized nature of the project area, such sites are likely to have been previously disturbed. During the EIR/EIS process, a qualified archaeologist would perform detailed surveys to determine the exact location and quality of any cultural resources in the affected area.

Three potential historic resources have been evaluated within 0.25-mile of the project limits. These resources are described as follows:

- The Seal Beach Naval Weapons Station is immediately adjacent to I-405 at the north end of the project. The site was evaluated in 2001 and was determined ineligible for the National Register of Historic Places (NRHP) through consultation with the SHPO (OHP, 2008).

- An electrical generator at the Fountain Valley City Hall was evaluated as a potential historic resource in 1995 and was found ineligible for the NRHP (OHP, 2008).

- The Diego Sepulveda Adobe in the City of Costa Mesa, which is located on Adams Avenue near Harbor Boulevard, was built as a station of Mission San Juan Capistrano. After secularization, the property became part of Rancho Santiago de Santa Ana, and the adobe was used as headquarters of Diego Sepulveda, later owner of the ranch. The adobe is a California Historic Landmark (No. 227) and was found eligible for the NRHP (OHP, 2008). The project is not expected to directly affect this resource.

8.2 Native American Resources

The immediate project area is assumed to have a low sensitivity to Native American resources due to the urbanized nature of areas adjacent to the I-405 corridor. In addition, no tribal lands are identified within the project study area. Coordination with the Native American Heritage Commission will be required during cultural resource studies to determine potential impacts to Native American resources.

8.3 Potential Cultural Resource Impacts

Given the recorded presence of cultural resources in the project area and the potential for ROW acquisition, impacts to cultural resources could occur. Further studies will be required to determine impacts to these resources. If the project is found to have potential impacts to sensitive paleontological resources, additional coordination and documentation will be required.

9. SECTIONS 4(f) AND 6(f)

9.1 Sections 4(f) and 6(f) Resources

Parks and recreation areas adjacent to I-405 that may be impacted include Cascade Park, the Santa Ana River Trail, Los Alamos Park, Gisler Park, Pleasant View Park, and College Park.

Mile Square Regional Park located in the City of Fountain Valley is categorized as a 6(f) resource (NPS, 2007).

The Seal Beach National Marine Refuge and the Bolsa Chica Ecological Reserve are each located approximately 5 miles southwest of the project area, and they can be accessed via I-405. Both provide habitat for federal- and state-listed sensitive species; however, the proposed project is not anticipated to result in impacts to either of these refuges.

Historic sites or sites eligible for listing in the NRHP are also considered as Section 4(f) resources. Based on a preliminary search of potential cultural resources, three sites were considered potentially historic, two of which were determined ineligible for listing in the NRHP.

The HPSR that will be prepared for this project during the PA/ED phase may identify other historic properties within the Area of Potential Effects (APE).

9.2 Potential Sections 4(f) and 6(f) Impacts

Permanent easements for public parks adjacent to I-405, temporary construction impacts, or constructive use of Section 4(f) properties may result as part of the project, depending on the selected alternative.

Since the Mile Square Regional Park is located 0.5 miles from I-405, no conversion of the 6(f) resource is expected with the proposed improvements.

Historic sites may also be impacted by the proposed project (see Section 8, Cultural Resources). If the project has an effect on properties on or eligible for the NRHP, then evaluation under Section 4(f) would be required.

10. HAZARDOUS WASTE/MATERIALS

10.1 Potential Hazardous Waste Sites

A preliminary Initial Site Assessment (ISA) was prepared for this project which provided a list of contaminated sites within the project area and identified potential hazardous waste issues. An update to the preliminary ISA will be required during the PA/ED stage for a full assessment of hazardous waste related impacts. Potential hazardous waste issues identified in the preliminary ISA are described as the following below:

- Aerially Deposited Lead (ADL) and agricultural chemicals in the shallow soil of the northbound and southbound sides of the freeway were found to be present in previous ADL studies performed within the corridor.

- Four dry-cleaner facilities that are located near the site that may potentially impact groundwater conditions at the freeway ROW were reported. No contamination has actually been reported, but dry cleaners release percholoroethylene (PCE), which can impact soil, soil vapor, and groundwater.

- There are 37 gas station leaking underground storage tank (LUST) cases reported at various freeway on-ramps and off-ramps. Twenty of these gas stations are active, and 17 have been closed. Although no cases of groundwater contamination extending to or across the freeway were reported, each of these cases may potentially impact groundwater at the freeway ROW boundaries.

- There is a low potential at the site for radon levels to exceed the EPA action level of 4.0 picocuries per liter (pCi/L) indicated by the Department of Conservation, California Geological Survey (2005) Database.

- There are two Department of Defense (DOD) facilities, comprised of the U.S. Naval Weapons Station in Seal Beach and Los Alamitos Armed Forces Reserve Center, that are located near I-405. Environmental investigations are ongoing to determine if there is any hazardous contamination resulting from military activity; however, results of these studies have not been reported in the EDR database.

- The Westminster Tract 2633 was classified as a National Priority Listed site (or superfund site), but it was delisted in September 2004 (EPA 2008).

- A search of federal and state American Society for Testing and Materials (ASTM) standard environmental databases was conducted to identify contaminated sites within a 1-mile radius of the project corridor (EDR, 2004) and a review of the Department of Toxic Substances Control hazardous site databases was also performed (DTSC, 2008). Approximately 60 sites were found within the search radius, most of which are listed in more than one database. Sites potentially affected by the project, which are considered to be within 300 feet of the project for this study, are listed in Table 7.

10.2 Potential Hazardous Waste/Materials Impacts

Based on preliminary design, ROW may be required from some of these identified potentially contaminated sites. An update to the preliminary ISA will be required during the PA/ED stage, which will assess hazardous waste and materials related impacts as the preliminary project

design advances. If it is found that the project will encroach on a contaminated property, remediation of these sites will be required prior to acquisition and construction of the project.

It is assumed that hazardous and potentially hazardous materials used in construction would be handled. The use, transport, and disposal of these hazardous materials would be conducted in accordance with applicable federal, state, and local requirements so that potential risks are reduced. Mitigation measures would be developed, as needed, in consultation with regulatory agencies.

Related studies, such an analysis of ADL in unpaved areas along the roadway and analysis of structures and roadway that would require demolition that could potentially contain lead-based paint (LBP) and/or ACM is recommended during the PS&E phase of the project. It should be included in the construction planning that small amounts of soil contaminated by oil and fuel may be encountered while making excavations. The contaminants will be managed if they are encountered. Agency case files for the two DOD properties and the Westminster superfund site should be reviewed to assess for potential impacts to the proposed project.

Table 7
Hazardous Waste Sites Potentially Impacted by the Project

Property	Database	Address
Newport Research Corporation	LUST	18203 Mount. Baldy Circle, Fountain Valley
Exxon	LUST	6011 Westminster Boulevard, Westminster
All American Asphalt	LUST CORTESE CA WDS EMI	14490 Edwards Street, Westminster
Sunset Ford	LUST	5440 Garden Grove Boulevard, Westminster
Orange County Fire Station	LUST	3131 Beverly Manor Drive, Seal Beach
Los Alamitos Armed Forces Research Station	DOD	City of Los Alamitos
Seal Beach Naval Weapons Station	DOD	City of Seal Beach
Westminster Mall	CA FID UST	195 Westminster Mall, Westminster
Storage USA	UST	7531 McFadden Avenue, Huntington Beach
Boomers	HAZNET LUST CORTESE	9063 Recreation Circle, Fountain Valley
Hyundai	RCRA-SQG	10550 Talbert Avenue, Fountain Valley
Custom Enamelers, Inc.	RCRA-SQG FINDS EMI	18340 Mount Baldy Circle, Fountain Valley

CA FID – Active and inactive underground storage tanks (USTs), as reported by the State Water Control Board.
CA WDS – California Water Resources Control Board – Waste Discharge System.
CORTESE – Public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release, and all solid waste disposal facilities from which there is known migration.
EMI – Emissions Inventory Data: Toxics and criteria pollutant emissions data collected by the California Air Resources Board (CARB) and local air pollution agencies.
FINDS – Contains facility information to other sources of information, including RCRIS; FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIC; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Surface Impoundments (SIA); TSCA Chemical in Commerce Information System (CICS)l PADS; RSRA-J (medical waste transporters/disposers); TRIS; and TSCA.
HAZNET – Data from hazardous waste manifests received annually by the DTSC.
HIST UST – List of historical USTs.
LUST – Inventory of reported leaking UST incidents.
RCRA-SQG – Information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act Database. Small quantity generators (SQG) generate between 100 kilograms (kg) to 1,000 kg of hazardous waste per month.

11. BIOLOGICAL RESOURCES

11.1 Setting and Sensitive Biological Resources

The area adjacent to I-405 and within the 1-mile study area is completely urbanized. Vegetation within the I-405 project corridor consists mostly of ornamental species, as well as some ruderal species. Open space within this area is relegated to city parks or major drainages.

According to the California Natural Diversity Database (CNDDB), sensitive plant and animal species, which are Federal Species of Concern (FSC), California Species of Concern (CSC), or listed in the California Native Plant Society (CNPS) list of sensitive plants[3] potentially occurring within a 1-mile radius of the project freeway segment include the following species:

- mud nama (*Nama stenocarpum Gray*): CNPS List 2.2
- southern tarplant (*Hemizonia parryi*): CNPS List 1B
- salt spring checkerbloom (*Sidalcea neomexicana)*: CNPS List 2.2
- Coulter's goldfields (*Lasthenia glabrata coulteri):* CNPS List 1B
- Los Angeles sunflower (*Helianthus nuttallii parishii*): CNPS List 1B
- Coast (San Diego) horned lizard (*Phrynosoma coronatum)*: FSC/DFG-CSC

Southern Cottonwood Willow Riparian Forest, which is a sensitive habitat type, potentially occurs along the course of the Santa Ana River within the study area; however, as observed during windshield surveys, the portion of the Santa Ana River adjacent and flowing below I-405 is completely channelized.

11.2 Potential Biological Impacts

Due to the highly developed nature of the I-405 corridor, it is not anticipated that any sensitive plant and animal species occur within the study area.

In addition, the presence of the Southern Cottonwood Willow Riparian Forest or any other sensitive habitats was not observed.

Removal of mature trees may affect nesting birds; a preconstruction survey conducted prior to disturbance of vegetation and adherence to survey recommendations would minimize potential impacts to nesting birds.

The potential spread of invasive species could occur during construction. The use of imported dirt could also contain invasive species. Temporary BMPs installed in place during project construction would limit the spread of these species.

Consistent with EO 13112, invasive species measures during construction and the planting of native vegetation to limit the spread of invasive species is recommended. Coordination with appropriate biological regulatory agencies, such as California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS), is recommended to facilitate the assessment of impacts on biological resources.

12. WETLANDS AND WATERS OF THE US

12.1 Existing Wetland and Jurisdictional Resources

The project crosses three watersheds: Santa Ana River watershed; Talbert watershed; and Westminster watershed. Within these three watersheds, the project crosses nine water bodies: Santa Ana River, East Fountain Valley Channel, Ocean View Channel, Heil Avenue Storm Drain, East Garden Grove-Wintersburg Channel, Westminster Channel, Anaheim-Barber City Channel, Bolsa Chica Channel, and the Montecito Storm Channel.

[3] List 1A – Plants presumed extinct in California; List 1B – Plants Rare, Threatened, or Endangered in California and Elsewhere; List 2 – Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere. CNPS threat ranks is described as follows: 0.1 – Seriously threatened in California; 0.2 – Fairly threatened in California; and 0.3 – Not very threatened in California.

Resources under the jurisdiction of the USACE would include Wetlands and Waters of the U.S., including tributaries. Waters of the U.S. are likely to occur within the project area due to the presence of major surface water drainages such as the Santa Ana River, for example.

12.2 Potential Wetlands and Jurisdictional Impacts

No wetlands were observed during windshield surveys. All of the drainages viewed within the study area are channelized with concrete and/or rip rap, and it is unlikely that USACE jurisdictional wetlands exist. Use of construction and treatment BMP facilities will minimize water quality impacts to wetlands or jurisdictional waters.

Anticipated improvements in five surface water crossings will require permits under the Clean Water Act. A Section 404 (Dredge and Fill) permit will be required due to permanent improvements being proposed in these channels. If permanent improvements exceed the established thresholds for a nationwide Section 404 permit, the project may require implementation of the NEPA-404 MOU between USACE, FHWA, and Caltrans.

A Significant Nexus determination study is recommended to determine which drainages and tributaries are jurisdictional under the USACE and would have downstream effects to Waters of the U.S. Coordination with USACE and SARWQCB is recommended to determine type of permits and related requirements for proposed improvements in five surface water crossings.

13. GEOLOGY AND SOILS

13.1 Existing Geologic Conditions

The project area is located in a seismically active region of southern California. The type and magnitude of seismic hazards affecting the I-405 corridor depend on its distance to active faults. Six potentially active faults are located within or near the project area. These include the Los Alamitos Fault, Newport-Inglewood Fault, Whittier Fault, El Modena Fault, Peralta Hills Fault, and San Andreas Fault. The Los Alamitos Fault and Newport-Inglewood Fault are the two closest faults to the I-405 corridor; therefore, they represent the greatest seismic hazard.

13.2 Potential Geologic Impacts

Liquefaction is the transformation of soil from a solid state into a liquefied state because of increased pore water pressure. The project corridor has a generally high water table, which makes the soils susceptible to liquefaction after an earthquake (California Geologic Survey, 2004). Most of Orange County, including the project area, is also susceptible to expansive soils due to the clay structure of the soil (County of Orange, 2004). Expansive soils have grains that swell and increase in volume when water is added. This triggers cracking, slipping, or sinking of residences, swimming pools, and sidewalks. Due to the relatively flat topography of the project corridor, landslides are unlikely to occur.

A geotechnical study is recommended during the EIR/EIS process to determine the composition of soils and the presence of fill within the immediate project area. The geotechnical study would address in detail the likelihood for liquefaction and expansive soils within the immediate project area. The results of the geotechnical study would be incorporated into the design process for compliance with Caltrans and federal guidelines and regulations for safety and seismic design standards and design standards for expansive soils.

14. TRANSPORTATION/TRAFFIC

14.1 Existing Transportation System

Within the limits of the project study area, I-405 has generally four to six general purpose lanes, one to two HOV lanes, and various auxiliary lanes in each direction (see Study Area and Existing Facility Section). Table 8 shows existing (year 2005) daily traffic volumes and travel lanes on I-405 in the study area. Trucks are approximately 3 percent of total volume throughout the entire project area based on Caltrans truck count data for year 2005. This corridor contains several major local street arterials. These arterials include:

- Bristol Street
- Harbor Boulevard
- Ellis Avenue/Euclid Street
- Brookhurst Street
- Warner Avenue
- Beach Boulevard
- Bolsa Avenue
- Goldenwest Street
- Springdale Street
- Bolsa Chica Road
- Seal Beach Boulevard
- N. Studebaker Road
- E. 7th Street

Table 8

I-405 Segment Limits: Existing Lanes, Daily and Peak Hour Traffic Volumes

I-405 Segment	PM	Existing Number of Lanes: HOV + GP	Year 2005 Average Annual Daily Traffic Volume	Year 2005 Peak Hour Traffic Volume
Harbor Boulevard to Brookhurst Street	11.7/13.8	2+12[1]	375,000	28,500
Brookhurst Street to SR-22 East	13.8/20.8	2+8	281,000	22,100
SR-22 to I-605	20.8/24.0	2+12[2]	390,000	29,000

[1] 2+10 north of Euclid Street to Brookhurst Street

[2] Scheduled for widening to 4+12 with construction of SR-22 Phase II HOV Lanes; existing is 2+10 north of SR-22 West interchange to I-605.

Source of traffic volume data: 2005 Traffic Volumes on California State Highways, California Department of Transportation, Division of Traffic Operations

14.2 Potential Traffic Impacts

This project will have several long-term benefits to regional and local traffic. The project would reduce congestion along I-405 and would thereby reduce the vehicle miles traveled on local streets by redistributing traffic to the widened freeway. This redistribution would result in additional traffic on those arterials with interchanges to the freeway. However, the proposed interchange improvements combined with the improved freeway operations would reduce interchange queues on the mainline.

The purpose of the improvements is to resolve traffic and transportation constraints along the I-405 corridor by constructing additional travel lanes on I-405 and improving interchanges, among other enhancements, between SR-73 and I-605 in Orange County. Proposed improvements are intended to ease traffic congestion and to increase circulation and access to and from Orange County. Proposed improvements are designed to accommodate existing and forecasted traffic on the freeway and adjacent surface streets.

During construction, adverse effects to traffic and local circulation may result. These adverse effects may be the result of lane closures along I-405 to accommodate construction equipment or ramp closures during interchange improvements.

Temporary lane closures have the potential to increase the amount of delay substantially along I-405 and may increase the amount of regional traffic utilizing local streets. Temporary lane closures should be implemented during non-peak hours, nights, or weekends. Lane closures should be avoided during holidays.

Ramp closures have the potential to affect businesses, especially businesses that are considered “freeway dependent.” Freeway-dependent businesses include gas stations and fast-food restaurants that are located near interchange systems.

Preparation of a TMP is recommended to address potential temporary traffic impacts. Preparation of a Traffic Impact Study/Circulation Report is recommended to assess both potential temporary construction impacts and long-term traffic operational impacts. If prolonged closures of interchange ramps are required, then a Ramp Closure Study is recommended to address impacts related to impaired access to businesses and essential services. Coordination with essential and emergency services is recommended during preparation of the TMP or Ramp Closure Study to share information and minimize service disruptions.

15. ENERGY

The construction of the proposed project may require a substantial amount of energy through the consumption of non-renewable fossil fuels. Use of construction equipment, hauling of materials, and out of direction detours resulting from potential lane and ramp closures are the sources of substantial energy consumption. These impacts are considered temporary and would diminish at the end of construction.

Improvements to the I-405 corridor would relieve congestion and reduce out of direction travel. By reducing the amount of out of direction travel, the project would have a long-term benefit to direct energy consumption. A reduction of indirect energy use could also be achieved through the addition of auxiliary lanes and improving traffic flow. Improved traffic flow would improve vehicle fuel efficiency and reduce routine vehicle maintenance by reducing wear and tear from stop-and-go conditions.

Balancing the short-term energy use during construction and the long-term energy savings, the proposed improvements to the I-405 corridor would not result in any substantial energy impacts.

For most projects, a separate detailed energy study will not be required. According to the FHWA Technical Advisory 6640.8A, a detailed energy study, including computations, is only required for large-scale projects with potentially substantial energy impacts. Since this project is not anticipated to result in substantial energy impacts, a separate energy study is not recommended. A discussion of energy impacts is recommended as part of the EIR/EIS. This discussion should conform to the Caltrans format described in the EIR/EIS annotated template. The energy analysis will also adhere to the FHWA “Energy Requirements for Transportation

Systems" manual. Potential energy saving project features should be considered during project design. Energy saving features may include energy efficient lighting, reduced grades, energy and water efficient landscaping design, and long-life pavement.

List of Preparers

Hazardous Waste Review by: Angela Schnapp Date: 3/3/08
Biological Review by: John Moeur Date: 2/19/08
Cultural Review by: Jeff Bingham Date: 2/21/08
Water Quality Review by: Ryan Hansen Date: 2/29/08
Noise Review by: Thanh Luc Date: 3/4/08
Air Quality Review by: Nasrin Behmanesh Date: 2/25/08
Community Impacts Review by: Amy Walston Date: 2/25/08

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ATTACHMENT 11

TASAS TABLE B

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California Department of Transportation

OTM22130

Table B - Selective Accident Rate Calculation

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

1. TASAS - TSN has officially replaced the TASAS - "Legacy" database.

2. Reports from TSN are to be used and interpreted by the California Department of Transportation (Caltrans) officials or authorized representative.

3. Electronic versions of these reports may be emailed between Caltrans' employees only using the State computer system.

4. The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409, and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 2441034

Request Name: 405, ROUTE 73 TO 605

Ref Date: 09/06/2007

Request- & Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates			Override ADT		Req. Type	Com- bine?	Excl Ramp?
									Rate	Inj%	Fat%	Main	Cross			
1 1	H	N	I	12 ORA 405 10.513 - 12 ORA 405 24.177	01-JAN-04	31-DEC-06	N	L						N	N	Y
1 2	H	S	I	12 ORA 405 10.513 - 12 ORA 405 24.177	01-JAN-04	31-DEC-06	N	L						N	N	Y

Event Log:

Job id is : 306811 Accidents Table B Request 405, ROUTE 73 TO 605 Submitted by T12AWONG
12 ORA 405 10.513 - 12 ORA 405 24.177 01/01/2004 TO 12/31/2006
12 ORA 405 10.513 - 12 ORA 405 24.177 01/01/2004 TO 12/31/2006

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance							Pers Kld Inj	ADT Main X-St	Total **MV+** or **MVM**	Accident Rates Actual		Accident Rates Average			
		Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark				Fat	F+I	Tot	Fat	F+I	Tot
12 ORA 405 010.513 - 12 ORA 405 024.176 0001-0001 2004-01-01 2006-12-31 *36 mo.*	13.664 MI H NORTH NA	2335	13	598	611	2041	121	717	14 851	160.0	2395.81	0.005	.26	.98	0.006	.38	1.24
12 ORA 405 010.513 - 12 ORA 405 024.176 0001-0002 2004-01-01 2006-12-31 *36 mo.*	13.664 MI H SOUTH NA	1990	5	538	543	1718	108	464	5 761	160.0	2395.81	0.002	.23	.83	0.006	.38	1.24

Accident Rates expressed as: **# of accidents / Million vehicle miles**

+ denotes that **Million Vehicles** (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

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ATTACHMENT 12

PLANNING SCOPING CHECKLIST

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ARTICLE 3 – Planning Scoping Checklist

PROJECT INFORMATION

District	County	Route	Post Miles	EA
12	ORA	405	10.3/24.1	0H100K

Project Description:
Add one or two general purpose lanes in each direction to I-405 from the area of the Euclid and Brookhurst interchanges to the area of the Seal Beach Boulevard, SR-22/7th Street, and I-605 interchanges. Add auxiliary lanes between most interchanges from Euclid Street to Valley View Street. Reconfigure interchanges from Euclid Street to Valley View Street to improve operations.

Title	**Name**	**Phone Number**
Project Manager	Vinh Pham	949-724-2097
Project Engineer	Jason Ly	949-724-2171
Contact Planner*		
Regional Planner/Air Quality Planner	Maureen El Harake Reg. Planning Br. Chief	949-724-2086
Systems Planner	Everrett C Evans Special Studies Br. Chief* Act. System Planning Br.Chief	949-223-5436
Local Development-Intergovernmental Review Planner (LD-IGR) Planner	Ryan Chamberlain LDR Br. Chief	949-724-2731
Community Planner	Ryan Chamberlain LDR Br. Chief	949-724-2731
Goods Movement Planner	Everrett C Evans Special Studies Br. Chief* Act. System Planning Br.Chief	949-223-5436
Transit Planner	Maureen El Harake Reg. Planning Br. Chief Aileen Kennedy - Coord.	949-724-2086 949-724-2239
Bicycle and Pedestrian Modes Coordinator	Maureen El Harake Reg. Planning Br. Chief - Barbara Gossett - Coord.	949-724-2086 949-440-4461
ITS Planner	Ed Khosravi - ITS Development Br. Chief	949-724-2453

	Henry Pham - TMC Sr. Transp. Elec. Engr.	949-939-3464
Native American Liaison	Charles Baker Env. Planning Br. Chief (New) Cheryl Sinopoli - Liason	949-724-2252 949-724-2855
Other		

*The Contact Planner coordinates with the other planners to provide complete project-related information. The Contact Planner identifies other planning contacts here.

Project Funding

Type of funding: STIP/SHOPP/Special	STIP/Special
Is this a measure project? If yes, what is the measure?	Yes, Renewed Measure M
Is this project split-funded? If yes, what is the measure?	Yes, Renewed Measure M and SAFETEA-LU Demonstration Funds
Other	

Regional Planning

Name of MPO/RTPA/LTC	Southern California Association of Governments
Date of RTP, page no.	RTP Amendment #3, adopted June 7, 2007
Air Quality District (Name)	Southern California Air Quality Management District
Project Description as Noted in the Regional Transportation Plan: "Construct one additional general purpose lane in each direction on I-405 and provide additional improvements from SR73 to LA County Line (This listing is to reflect the addition of funds for study only)."	
Does Air Quality District have attainment or non-attainment status? Non-attainment	
If yes for non-attainment status, please give details?	
Based on the Alternative selected, may need to update 2008 Draft SCAG RTP. Verify and describe any conformity issues with the project, including making sure that Design Concept and Scope are appropriately carried through from Regional Transportation Plan conformity analysis into the programming and project delivery processes.	

Native American Planning System Planning

1. Is the project within an Indian Reservation or Rancheria? A. Is the Project near an Indian Reservation or Rancheria?	No No
B. If so, has the Tribal Government been contacted and consulted?	

C. Will the project have any impacts to the Native American community, and if so, has mitigation been identified and accounted for in the estimated costs, i.e., Native American monitoring? (Example of impacts below) i. Transportation ii. Land Use iii. Employment iv. Economic Development v. Housing vi. Community Development vii. Environmental Compliance (i.e., Section 106 Consultation)	To be determined during the PA/ED phase.
D. Does the Department have the right of way? If the project requires an expansion onto trust or allotted lands, has the Tribe and the Bureau of Indian Affairs been notified? If yes, state response; if no will we have to go on Native American land?	No
E. Are there any applicable Tribal laws, i.e., Tribal Employment Rights Ordinances (TERO), environmental considerations, etc., that need to be included into the contract language which will require coordination with the Tribe for compliance?	No

F. If the project is *not* on or near an Indian Reservation, but is within the ancestral area of a Tribe, are there any prehistoric, archeological, cultural, spiritual and ceremonial sites located within or adjacent to the planned project? Are there any other social factors that will have impact to the project planned? If yes, please give details.	No
a. If so, has the Tribe, Native American Heritage Commission, descendents or other applicable person, Tribe, or public entity been contacted?	
b. Will the project require a Native American monitor?. If so has the cost been included into the project estimates?	To be determined during the PA/ED phase.
G. In the event of project redesign, will the changes impact a Native American community as describe above in #1 or #2? Will different alternatives of project redesign have an impact?	No

System Planning

TCR Date	November 1999 – RCR
Was this project identified in the TCR?	Some portions of the proposed project are included in the RCR.
What were the deficiencies in the TCR? Is the project recommendation still valid to correct them? If yes, please give details.	The RCR recommends some additional general purpose lanes and auxiliary lanes in the corridor. The proposed project provides additional operational improvements including auxiliary lanes at more locations and interchange reconfigurations.
Rural, Urbanizing, or Urban?	Urban
Functional Classification:	Freeway
Describe the Forecasted 10 and 20 year VMT, AADT, and 5 Axle Truck data in the TCR. Source of Forecast: Traffic and Project Analysis Tools: Name the Micro, Macro tool(s) used.	The RCR contains traffic forecasts for the year 2020. AADT forecast ranges from 294.100 to 424,000 under the "Null" condition. The forecasts were developed using the Los Angeles Regional Transportation Study (LARTS) model. Truck volumes are stated to range from 4.9% to 7.1% of ADT, with the low south of the proposed project limits and the high in the vicinity of SR-22. More recent data developed using the Orange County Traffic Analysis Model (OCTAM) forecast year 2030 daily traffic ranging from 330,000 to 525,000 in year 2030. Truck traffic volume is approximately 3% of traffic based on year 2005 counts reported by Caltrans. Five-axle truck volume within the proposed project limits are approximately 4,000 per day or about 1.25% of traffic.
Analysis using the California Transportation Investment System GIS Tool	
Describe the bicycle facility needs from the TCR.	Bicycles are not permitted on I-405. The OCTA Commuter Bikeways Strategic Plan (Bike Plan) (adopted

	August 10, 2001 and currently being updated) shows one Class I bikeway facility crossing I-405 within the proposed project limits. That bikeway runs along the Santa Ana River bank and crosses beneath the bridge carrying the freeway over the river and Euclid Street. Several Class II bikeways cross the freeway on arterial overcrossings.
Describe the pedestrian facility needs from the TCR.	Pedestrians are not permitted on I-405. Pedestrian needs are not discussed in the RCR.
Project Setting: The proposed project is located within the urbanized portion of north Orange County.	

IGR Planning: List any existing, planned or programmed projects (project forward 10 years) that may affect the proposed transportation improvements.

Local Agency	Date	Name and Type of project/Mitigation/Who is paying for Mitigation?	Traffic Mitigation	Funds Provided y Local Government or Private Entity

Community Planning:

Are there any active/proposed Environmental Justice or Community-Based Planning Grants in the project area?	To be determined during the PA/ED phase.
If so, describe the project and how/where it will interact with the project:	
Will the transportation improvements impact the community?	There are potential noise, visual, right-of-way, and other impacts that will be more fully investigated during the PA/ED phase of the project.
If so, describe community participation plans for this PSR:	The Major Investment Study the preceded the PSR/PDS included numerous public meetings held along the corridor of the proposed

	project. It also included local and community representation in the Project Development Team, Stakeholders Working Group, City Managers Working Group, and Policy Working Group (consisting principally of elected officials from the corridor). The PSR has held multiple meetings with the cities along the corridor, as well as meetings of the Project Development Team and the Policy Working Group.
Describe how Context Sensitive Solutions improve the transportation project?	Context sensitive solutions have been employed to minimize potential right-of-way impacts of the project. This effort will continue during the PA/ED phase.
Does this corridor serve as a main street? What main street functions and features need to be protected or preserved?	No
Is the community requesting in traffic calming features for this corridor?	No
Has Community Planning worked with neighborhood/community groups in the area of the proposed improvements?	
Describe the issues, concerns, and recommendations of the neighborhood/community groups?	A principal concern is right-of-way acquisition.
How can the neighborhood/community group recommendations be incorporated into the project?	The proposed project has been designed to minimize right-of-way impacts.
Describe any other community planning issues	

Goods Movement Planning:

Is the project located on a Global Gateways Development Program route?	Yes, revised to include I-405
Is the project on a current and/or projected high truck volume route (e.g., AADTT of 5 axle trucks is greater than 3000. How does the project take this demand into consideration?	Five-axle truck volume within the proposed project limits are approximately 4,000 per day or about 1.25% of traffic. The proposed project reduces delay in the corridor.
Is the project located near a land or seaport? If so describe the port and discuss circulation needs:	The proposed project is less than ten miles from the Ports of Long Beach and Los Angeles. The

	proposed project does not directly affect port land-side circulation, but improves access to the port by reducing delay for trucks using I-405 to and from the ports.
List the airport located within ten miles of the project. Is the airport access on the same State highway as the project? Describe how this project improves the airport circulation?	The proposed project is less than five miles from both the Long Beach (LGB) and Orange County (SNA) airports. The proposed project does not directly affect airport circulation, but improves access to the airport by reducing delay for vehicles using I-405 to and from the airports.
Describe how this project will enhance the movement of goods, both locally and throughout the State:	The proposed project reduces delay in the corridor by providing additional capacity on the freeway.
Describe the special features being considered for the project to accommodate truck traffic, and at-grade railroad crossings?	There are no "special" features to accommodate trucks proposed in this project. There are no at-grade railroad crossings.
How does the project integrate with other modes, e.g., rail, maritime, air?	The proposed project reduces delay in the corridor for vehicles accessing air and port facilities within ten miles of the corridor. (See Transit below)
Other Goods Movement issues?	Truck traffic volume is approximately 3% of traffic based on year 2005 counts reported by Caltrans. Five-axle truck volume within the proposed project limits are approximately 4,000 per day or about 1.25% of traffic.

Transit:

Name the local transit authority that operates within the corridor near the project.	Orange County Transportation Authority
Describe the transit authority's improvement plans that impact the corridor	OCTA has plans to provide a bus-rapid-transit routes along Westminster Avenue that would cross I-405 within the project limits.
Is the project near a transit center? Describe project improvements that accommodate transit facilities:	The Goldenwest Transit Center is located south of I-405 between the near the Beach Boulevard and

	Bolsa Avenue/Goldenwest Street interchanges. Interchange improvements will improve access to the freeway.
Describe the transit improvement options that may be considered?	Rail and bus-rapid-transit options in the median of I-405 were considered for the corridor during the Major Investment Study. Neither was included in the Locally Preferred Strategy adopted by the OCTA Board of Directors.
Describe potential impacts to existing transit facilities.	None.

Bicycle Facilities:

If bicycling is not prohibited on this route, are there continuous existing bicycle facilities (bicycle lanes or routes) or shoulder conditions suitable for bicycling within the project limits? If yes, describe.	Bicycles are prohibited on I-405.
If facilities suitable for bicycle travel on this route are discontinuous, describe deficiencies?	There are no such facilities on I-405.
Identify and discuss local bicycle transportation plans.	The OCTA Commuter Bikeways Strategic Plan (Bike Plan) (adopted August 10, 2001 and currently being updated) shows one Class I bikeway facility crossing I-405 within the proposed project limits. That bikeway runs along the Santa Ana River bank and crosses beneath the bridge carrying the freeway over the river and Euclid Street. Several Class II bikeways cross the freeway on arterial overcrossings.
How does this corridor accommodate bicyclists (i.e., bicycle paths, lanes, routes)?	Several Class II bikeways cross the freeway on arterial overcrossings. The proposed project would accommodate these facilities as part of any overcrossing replacements.
Does this corridor serve as a main street? If so, describe how this project will benefit parking/pedestrian crossing facilities/bicycle lanes.	No
Describe how this project will affect bicycle travel conditions.	The proposed project would accommodate the Class II bikeway facilities as part of any overcrossing replacements. Other affects would be limited.

Are there any designated bicycle facilities (lanes/routes/paths) proposed for this route by local agencies? If yes, describe.	No
Will the construction of a new freeway or modification to an existing freeway sever or destroy an existing facility open to bicycle travel? If yes, describe the alternate bicycle route that already exists or that will be provided as part of this project.	No

Pedestrian Facilities

How does this corridor accommodate pedestrians? Are there sidewalks, or are pedestrians forced to walk in the roadway?	Pedestrians are prohibited on I-405. The Heil Avenue pedestrian overcrossing is proposed for replacement.
Are land use conditions such that pedestrians regularly move along the highway? If "yes," and continuous sidewalks do not exist, describe local or regional plans to provide continuous sidewalks.	No
Will the construction of a new freeway or modification to an existing freeway sever or destroy an existing facility open to pedestrian travel? If yes, describe the alternate pedestrian route that already exists or that will be provided as part of this project.	No

ADA Facility Improvements

Does this corridor have ADA features to accommodate disabled pedestrians?	Bridge profiles to be developed in the PA/ED phase of the project will consider ADA requirements for sidewalk grades.
Described the current availability of disabled access.	Varies by location.

Miscellaneous and Other Unique Features

Does this corridor accommodate equestrian traffic? Identify impacts of this project on equestrian traffic.	No. This is an urban area without equestrian facilities.
Other	I-405 provides access for military and civilian vehicles to two federal military reservations in the project corridor: the Seal Beach Naval Weapons Station in Seal Beach and the Joint Forces Training Base in Los Alamitos.

Intelligent Transportation Systems:

Identify/Describe the ITS components planned for this project.	Specific ITS components for this project will be identified during the PA/ED phase. A fiber optic line and other items have been included in the project cost estimate.
The ITS components have to be part of the Regional or Statewide Architecture. Identify which applies to this project.	Specific ITS components for this project will be identified during the PA/ED phase.
Document how the systems engineering analysis requirements are being met for the ITS components of this project. Source: Systems Engineering Guidebook for ITS/Local Assistance Guide for ITS.	Specific ITS components for this project will be identified during the PA/ED phase.
Document the compatibility of the ITS improvements with the Traffic Operations Master Plan.	Specific ITS components for this project will be identified during the PA/ED phase.

ATTACHMENT 13

COOPERATIVE AGREEMENT BETWEEN DEPARTMENT OF TRANSPORTATION AND OCTA FOR PA/ED

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12-ORA-405, PM 10.3/24.1
In the Cities of Costa Mesa, Fountain Valley, Westminster, Huntington Beach, and Seal Beach
12-0H1000
District Agreement No. 12-594
OCTA Agreement No. C-7-1483

This AGREEMENT, entered into and made effective on _____ __, 2008, is between the STATE OF CALIFORNIA, acting by and through its Department of Transportation, referred to herein as "STATE", and the

ORANGE COUNTY TRANSPORTATION AUTHORITY, a public corporation of the State of California, referred to herein as "AUTHORITY".

RECITALS

1. The STATE and AUTHORITY, pursuant to Streets and Highways Code sections 114 and 130, are authorized to enter into a Cooperative Agreement for improvements to the State Highway System (SHS) within AUTHORITY's jurisdiction.

2. AUTHORITY desires to perform preliminary engineering and preparation of environmental documentation for State Highway improvements consisting of widening northbound and southbound Interstate 405 (I-405) from approximately 0.26 mi. south of the Orange County Line (PM 10.30) and Los Angeles County Line (PM 0.00) near the City of Long Beach to approximately 1.55 mi. north of State Route 55 (SR-55) in the City of Costa Mesa (PM 24.20), referred to herein as the "PROJECT".

3. The terms of this Agreement shall supersede any inconsistent terms of any prior Memorandum of Understanding (MOU) or Agreement relating to PROJECT.

4. PROJECT construction and preparation of detailed Plans, Specifications and Estimate (PS&E) of PROJECT, as well as landscape maintenance and construction, will be the subjects of separate future Agreement(s).

5. The Agreement will define the roles and responsibilities of the California Environmental Quality Act (CEQA) Lead Agency and CEQA Responsible Agency regarding environmental documentation, studies, and reports necessary for compliance with CEQA. This Agreement will also define roles and responsibilities for compliance with National Environmental Policy Act (NEPA), if applicable.

6. The parties now define herein below the terms and conditions under which PROJECT is to be developed.

SECTION I

AUTHORITY AGREES:

1. To fund one hundred percent (100%) of all project development costs in the preparation of Project Report (PR) and Environmental Document (ED), except for costs of STATE's Independent Quality Assurance (IQA), STATE's review, comment, and approval, if appropriate, of the PROJECT environmental documentation for CEQA and NEPA, if applicable.

2. All PROJECT work performed by AUTHORITY, or performed on AUTHORITY's behalf, shall be performed in accordance with all State and Federal laws, regulations, policies, procedures, and standards that STATE would normally follow. All such PROJECT work shall be submitted to STATE for STATE's review, comment, and concurrence at appropriate stages of development.

3. All PROJECT work, except as set forth in this Agreement, is to be performed by AUTHORITY. Should AUTHORITY request that STATE perform any portion of PROJECT work, except as otherwise set forth in this Agreement, AUTHORITY shall first agree to

reimburse STATE for such work pursuant to an amendment to this Agreement or a separate executed Agreement.

4. To have a PR and ED prepared, at no cost to STATE, and to submit each to STATE for STATE's review and concurrence at appropriate stages of development. The PR shall be signed on behalf of AUTHORITY by a Civil Engineer registered in the State of California.

5. To permit STATE to monitor, participate, and oversee the selection of personnel who will prepare the PR, conduct environmental studies, and prepare environmental documentation.. AUTHORITY agrees to consider any request by STATE to discontinue the services of any personnel considered by STATE to be unqualified on the basis of credentials, professional expertise, failure to perform and/or other pertinent criteria.

6. Personnel who prepare the environmental documentation, including the investigative studies and technical environmental reports, shall be made available to STATE, at no cost to STATE, if deemed appropriate by AUTHORITY, through completion of PROJECT construction to discuss problems which may arise during PS&E, right of way acquisition, construction, and/or to make design revisions for contract change orders.

7. To make written application to STATE for necessary encroachment permits authorizing entry of AUTHORITY onto the SHS right-of-way to perform surveying and other investigative activities required for preparation of the PR and ED.

8. To identify and locate all utility facilities within the area of PROJECT as part of the design responsibility for PROJECT. All utility facilities not relocated or removed in advance of construction shall be identified on the PS&E for PROJECT.

9. If any existing utility facilities conflict with the construction of PROJECT or violate STATE's encroachment policy, AUTHORITY shall make all necessary arrangements with the owners of such facilities for their timely accommodation, protection, relocation, or removal.

10. To be responsible for, and to the STATE's satisfaction, the investigation of potential hazardous material sites within and outside of the existing SHS right of way that could impact PROJECT as part of performing any preliminary engineering work If AUTHORITY discovers hazardous material or contamination within PROJECT study area during said investigation, AUTHORITY shall immediately notify STATE.

11. All aerial photography and photogrammetric mapping for PROJECT shall conform to STATE's latest standards.

12. An electronic (compatible with STATE software) and paper copy of the PR, ED and original survey documents resulting from surveys performed for PROJECT, including original field notes, adjustment calculations, final results, and appropriate intermediate documents, shall be delivered to STATE and shall become property of STATE. For aerial mapping, all information and materials listed in the document "Materials Needed to Review Consultant Photogrammetric Mapping" shall be delivered to STATE and shall become property of STATE.

SECTION II

STATE AGREES:

1. At no cost to AUTHORITY, to complete STATE's review as CEQA Lead Agency and NEPA Lead Agency, if applicable, of the environmental documents prepared and submitted by AUTHORITY and to provide IQA of all AUTHORITY work necessary for completion of the Project Report and Environmental Document for PROJECT done by AUTHORITY, including, but not limited to, investigation of potential hazardous material sites undertaken by AUTHORITY or its designee, and provide prompt reviews and concurrence, as appropriate, of submittals by AUTHORITY, while cooperating in timely processing of documents necessary for completion of the environmental documentation and PR for PROJECT.

2. Upon proper application by AUTHORITY and by AUTHORITY's contractor, to issue, at no cost to AUTHORITY and AUTHORITY's contractor, the necessary encroachment permits for required work within the SHS right of way as specifically defined elsewhere in this Agreement.

SECTION III

IT IS MUTUALLY AGREED:

1. All obligations of STATE under the terms of this Agreement are subject to the appropriation of resources by the Legislature, State Budget Act authority and the allocation of funds by the California Transportation Commission (CTC).

2. The parties to this Agreement understand and agree that STATE's (IQA) is defined as providing STATE policy and procedural guidance through to completion of the PROJECT preliminary engineering phase administered by AUTHORITY. This guidance includes prompt reviews by STATE to assure that all work and products delivered or incorporated into the PROJECT by AUTHORITY conform to then existing STATE standards. IQA does not include any PROJECT related work deemed necessary to actually develop and deliver the PROJECT, nor does it involve any validation to verify and recheck any work performed by AUTHORITY and/or its consultants or contractors and no liability will be assignable to STATE, its officers and employees by AUTHORITY under the terms of this Agreement or by third parties by reason of STATE's IQA activities.

3. The parties to this Agreement hereto will execute and implement PROJECT in accordance with the Scope of Work, attached and made a part of the Agreement, which outlines the specific roles and responsibilities of the parties hereto. The attached Scope of Work may be modified in writing in the future to reflect changes in the roles and responsibilities of the respective parties. Such modifications shall be made by a formal amendment executed by the parties hereto.

4. The Major Investment Study (MIS) Locally Preferred Strategy Alternative 4 for PROJECT, approved by AUTHORITY's Board of Directors on October 14, 2005 and the Project Study Report/Project Development Support (PSR/PDS) for PROJECT, scheduled for approval on June 30, 2008 are by this reference, made an express part of this Agreement.

5. The basic design features shall comply with those addressed in the approved PSR/PDS, unless modified as required for completion of the PROJECT's environmental documentation and/or if applicable, requested by the Federal Highway Administration (FHWA).

6. The design and preparation of environmental documentation and related investigative studies and technical environmental reports for PROJECT shall be performed in accordance with all applicable Federal and STATE standards and practices current as of the date of performance. Any exceptions to applicable design standards shall first be approved by STATE for approval via the processes outlined in STATE's Highway Design Manual and appropriate memoranda and design bulletins published by STATE. In the event that STATE proposes and /or requires a change in design standards, implementation of new or revised design standards shall be done as part of the work on PROJECT in accordance with STATE's current Highway Design Manual Section 82.5, "Effective Date for Implementing Revisions to Design Standards". STATE shall consult with AUTHORITY in a timely manner regarding effects of proposed and/or required changes on PROJECT.

7. AUTHORITY's share of all changes in development costs associated with modifications to the basic design features as described above shall be in the same proportion as described in this Agreement, unless mutually agreed to the contrary by STATE and AUTHORITY in a subsequent amendment to this Agreement.

8. STATE will be the CEQA Lead Agency and AUTHORITY will be a CEQA Responsible Agency. STATE will be the NEPA Lead Agency if applicable. AUTHORITY will assess PROJECT impacts on the environment and AUTHORITY will prepare the appropriate level of environmental documentation and necessary associated supporting investigative studies and technical environmental reports in order to meet the requirements of CEQA and if applicable NEPA. AUTHORITY will submit to STATE all investigative studies and technical environmental reports for STATE's review, comment, and approval. The environmental document and/or categorical exemption/exclusion determination, including the administrative draft, draft, administrative final, and final environmental documentation, as applicable, will require STATE's review, comment, and approval prior to public availability.

   If, during preparation of preliminary engineering, new information is obtained which requires the preparation of additional environmental documentation to comply with CEQA and NEPA if applicable, this Agreement will be amended to include completion of these additional tasks by AUTHORITY.

9. AUTHORITY agrees to obtain, as a PROJECT cost, all necessary PROJECT permits, agreements and/or approvals from appropriate regulatory agencies, unless the parties agree otherwise in writing. If STATE agrees in writing to obtain said PROJECT permits, agreements, and/or approvals, those said costs shall be paid by AUTHORITY, as a PROJECT cost.

10. AUTHORITY shall be fully responsible for complying with and implementing any and all environmental commitments set forth in the environmental documentation, permit(s), agreement(s) and/or environmental approvals for PROJECT. The costs of said compliance and implementation shall be a PROJECT cost.

11. If there is a legal challenge to the environmental documentation, including supporting investigative studies and/or technical environmental report(s), permit(s), agreement(s), environmental commitments and/or environmental approval(s) for PROJECT, all legal costs associated with those said legal challenges shall be a PROJECT cost.

12. AUTHORITY, subject to STATE's prior review and approval, as a PROJECT cost, shall be responsible for preparing, submitting, publicizing and circulating all public notices related to the CEQA environmental process and if applicable, the NEPA environmental process, including, but not limited to, notice(s) of availability of the environmental document and/or determinations and notices of public hearings. Public notices shall comply with all State and Federal laws, regulations, policies and procedures. STATE will work with the appropriate Federal agency to publish notices in the Federal Register, if applicable.

    STATE, as a PROJECT cost, shall be responsible for overseeing the planning, scheduling and holding of all public meetings/hearings related to the CEQA environmental process and if applicable, the NEPA environmental process. AUTHORITY, to the satisfaction of STATE and subject to all of STATE's and FHWA's policies and procedures, shall be responsible for performing the planning, scheduling and details of holding all public meetings/hearings related to the CEQA environmental process and if applicable, the NEPA environmental process. STATE will participate as CEQA Lead Agency and if applicable, the NEPA Lead Agency, in all public meetings/hearings related to the CEQA environmental process and if applicable, the NEPA environmental process, for PROJECT. AUTHORITY shall provide STATE the opportunity to provide comments on any public meeting/hearing exhibits, handouts or other materials at least ten (10) days prior to any such public meetings/hearings. STATE maintains final editorial control of exhibits, handouts or other mateials to be used at public meetings/hearings.

13. In the event AUTHORITY would like to hold separate and/or additional public meetings/hearings regarding the PROJECT, AUTHORITY must clarify in any meeting/hearing notices, exhibits, handouts or other materials that STATE is the CEQA Lead Agency and if applicable, the NEPA Lead Agency, and AUTHORITY is the CEQA Responsible Agency. Such notices, handouts and other materials shall also specify that public comments gathered at such meetings/hearings are not part of the CEQA and if applicable, NEPA, public review process. AUTHORITY shall provide STATE the opportunity to provide comments on any meeting/hearing exhibits, handouts or other materials at least ten (10) days prior to any such meetings/hearings. STATE maintains final editorial control of exhibits, handouts or other materials to be used at public meetings/hearings solely with respect to text or graphics that could lead to public confusion over CEQA and if applicable, NEPA, related roles and responsibilities.

14. The party that discovers HM will immediately notify the other party(ies) to this Agreement.

    HM-1 is defined as hazardous material (including but not limited to hazardous waste) that requires removal and disposal pursuant to federal or state law, whether it is disturbed by PROJECT or not.

    HM-2 is defined as hazardous material (including but not limited to hazardous waste) that may require removal and disposal pursuant to federal or state law, only if disturbed by PROJECT.

15. STATE, independent of PROJECT, is responsible for any HM-1 found within existing SHS right of way. STATE will undertake HM-1 management activities with minimum impact to PROJECT schedule and will pay all costs for HM-1 management activities.

    AUTHORITY, independent of PROJECT, is responsible for any HM-1 found outside existing SHS right of way. AUTHORITY will undertake HM-1 management activities with

minimum impact to PROJECT schedule and will pay all costs for HM-1 management activities.

16. If HM-2 is found within the limits of PROJECT, the public agency responsible for advertisement, award, and administration (AAA) of the PROJECT construction contract will be responsible for HM-2 management activities.

    Any management activity cost related to HM-2 is a PROJECT construction cost.

17. Management activities related to either HM-1 or HM-2 include, without limitation, any necessary manifest requirements and designation of disposal facility.

18. STATE's acquisition or acceptance of title to any property on which any hazardous material is found will proceed in accordance with STATE's policy on such acquisition.

19. A separate Cooperative Agreement(s) will be required to address development of Plans, Specifications and Estimate, Landscape Maintenance, and to cover responsibilities and funding for the construction phase of PROJECT.

20. All administrative reports, studies, materials, and documentation, including, but not limited to, all administrative drafts and administrative finals, relied upon, produced, created or utilized for PROJECT will be held in confidence pursuant to Government Code section 6254.5(e). The parties agree that said material will not be distributed, released or shared with any other organization, person or group other than the parties' employees, agents and consultants whose work requires that access without the prior written approval of the party with the authority to authorize said release and except as required or authorized by statute or pursuant to the terms of this Agreement.

21. Nothing within the provisions of this Agreement is intended to create duties or obligations to third parties not parties to this Agreement or to affect the legal liability of either party to the Agreement by imposing any standard of care with respect to the development, design, construction, operation or maintenance of SHS and public facilities different from the standard of care imposed by law.

22. Neither STATE nor any officer or employee thereof is responsible for any injury, damage or liability occurring by reason of anything done or omitted to be done by AUTHORITY under or in connection with any work, authority or jurisdiction conferred upon AUTHORITY or arising under this agreement. It is understood and agreed AUTHORITY will fully defend, indemnify and hold harmless STATE and all its officers and employees from all claims, suits or actions of every name, kind and description brought forth under, including, but not limited to, tortuous, contractual, inverse condemnation or other theories or assertions of liability occurring by reasons of anything done or omitted to be done by AUTHORITY under this agreement.

23. Neither AUTHORITY nor any officer or employee thereof is responsible for any injury, damage or liability occurring by reason of anything done or omitted to be done by STATE under or in connection with any work, authority or jurisdiction conferred upon STATE or arising under this agreement. It is understood and agreed that STATE will fully defend, indemnify and hold harmless AUTHORITY and all its officers and employees from all claims, suits or actions of every name, kind and description brought forth under, including, but not limited to, tortuous, contractual, inverse condemnation or other theories or assertions of liability occurring by reason of anything done or omitted to be done by STATE under this agreement.

24. Prior to the commencement of any work pursuant to this Agreement, either STATE or AUTHORITY may terminate this Agreement by written notice to the other party.

25. No alteration or variation of the terms of this Agreement shall be valid unless made by a formal amendment executed by the parties hereto and no oral understanding or Agreement not incorporated herein shall be binding on any of the parties hereto.

26. This Agreement shall terminate upon the satisfactory completion of all post-PROJECT construction obligations of AUTHORITY and the delivery of required PROJECT construction documents, with concurrence of STATE, or on December 30, 2011, whichever is earlier in time, except that the ownership, operation, maintenance, indemnification, environmental commitments, legal challenges, and claims articles shall remain in effect until terminated or modified, in writing, by mutual agreement. Should any construction related or other claims arising out of PROJECT be asserted against one of the parties, the parties agree to extend the fixed termination date of this Agreement, until such time as the construction related or other claims are settled, dismissed or paid.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

By:_____
Will Kempton
Director

By:_____
Jim Beil
Deputy District Director
Capital Outlay Program

APPROVED AS TO FORM AND PROCEDURE:

By:_____
Attorney
Department of Transportation

CERTIFIED AS TO FUNDS:

By: _____
District Budget Manager

CERTIFIED AS TO FINANCIAL TERMS AND POLICIES:

By: _____
Accounting Administrator

ORANGE COUNTY
TRANSPORTATION AUTHORITY

By: _____
Arthur T. Leahy
Chief Executive Officer

APPROVED AS TO FORM AND PROCEDURE:

By: _____
Kennard R. Smart, Jr.
General Counsel

Approved: Date:

_____
KIA MORTAZAVI
Executive Director, Development

SCOPE OF WORK

This Scope of Work outlines the specific areas of responsibility for various project development activities for the proposed widening of I-405 between I-605 to approximately SR-73.

1. STATE will be the Lead Agency for CEQA and AUTHORITY will be a Responsible Agency for CEQA. STATE will also be the Lead Agency for NEPA, under the authority of the NEPA delegation, except for Air Quality approval for which FHWA is the lead agency. AUTHORITY will assess impacts of PROJECT on the environment and AUTHORITY will prepare the ED and supporting technical studies to meet the requirements of CEQA and NEPA. The draft and final ED will require STATE's review and approval prior to public circulation. AUTHORITY will provide all data for and prepare the Draft Project Report (DPR) and the Project Report (PR). STATE will review, process, and approve the PROJECT and ED under the authority of the NEPA delegation. AUTHORITY will be responsible for the CEQA/NEPA public involvement process, including scoping and public meetings.

2. AUTHORITY and STATE concur that the proposal is a Category 4A as defined in STATE's Project Development Procedures Manual.

3. AUTHORITY will submit drafts of the environmental technical reports and individual sections of the draft environmental documents to STATE, as they are developed, for review and comment. Traffic counts and projections to be used in the various reports shall be supplied by STATE if available, or by AUTHORITY. Existing traffic data shall be furnished by AUTHORITY.

4. STATE will review, monitor, and approve all project development reports, studies, and plans. All reviews performed by STATE shall be completed within 30 days.

5. STATE will prepare the revised freeway Agreement and obtain approval of any new public road connection(s) from the California Transportation Commission.

6. All phases of PROJECT, from inception through construction, whether implemented by AUTHORITY or STATE, will be developed in accordance with all policies, procedures, practices, and standards that STATE would normally follow.

7. Detailed steps in the project development process are attached to this Scope of Work. These Attachments are intended as a guide to STATE's and AUTHORITY's staff.

ATTACHMENT 1
PLANNING PHASE ACTIVITIES

PROJECT ACTIVITY	RESPONSIBILITY STATE	AUTHORITY
1. ENVIRONMENTAL ANALYSIS & DOCUMENT PREPARATION		
Establish Project Development Team (PDT)		X
Approve PDT		X
Project Category Determination	X	
Identify Preliminary Alternatives and Costs		X
Prepare and Submit Environmental Studies and Draft PR		X
Review and Approve Environmental Studies and Draft PR	X	
Prepare and Submit Draft Environmental Document (DED)		X
District Review of DED & Draft PR	X	
Circulate DED	X	
Issue Notice of Availability of DED		X
Hold Public Meetings		X
Prepare and Submit Final ED		X
District Review and Approve Final ED and Final PR	X	
2. PROJECT GEOMETRICS DEVELOPMENT		
Prepare Existing Traffic Analysis		X
Prepare Future Traffic Volumes for Alternatives		X
Prepare Project Geometrics and Profiles		X
Prepare Layouts and Estimates for Alternatives		X
Prepare Operational Analysis for Alternatives		X
Review and Approve Project Geometrics and Operational Analysis	X	
3. PROJECT APPROVAL		
Lead Agency for Environmental Compliance Certifies ED in Accordance with its Procedures	X	
Finalize and Submit PR with Certified ED for Approval		X
Approve Project Report	X	

ATTACHMENT 2
EXISTING CONDITIONS & BACKGROUND

I-405 in Orange County north of SR-73 to I-605 has several distinct segments. The freeway segment from SR-73 north to Euclid Street has been reconstructed. This segment has a single HOV lane and six (6) general-purpose lanes in each direction with numerous auxiliary lanes and braided ramps serving interchanges at Fairview Road, Harbor Boulevard (including a new ramp from South Coast Drive and Hyland Avenue), and Euclid Street.

At Euclid Street, there is a "lane drop". North of Euclid Street, there are five (5) general-purpose lanes and a single HOV lane in each direction.

There is another lane drop at Brookhurst Street. North of Brookhurst Street to SR-22 (near Valley View Street), there are four (4) general-purpose lanes and a single HOV lane in each direction. There are no auxiliary lanes in this section that has interchanges at Warner Avenue, Magnolia Street, Edinger Avenue, Beach Boulevard (including ramps terminating at Center Avenue), Bolsa Avenue, Goldenwest Street, Westminster Boulevard (including a ramp terminating on Willow Lane), Springdale Street, Garden Grove Boulevard, and Valley View Street. This segment has the least number of travel lanes in the study area.

In the SR-22 overlap segment between Valley View Street and the SR-22 (7th Street ramps) there are six (6) general-purpose lanes and a single HOV lane in each direction. There is a lane drop on I-405 at the SR-22 (7th Street) ramps. North of the SR-22 (7th Street) ramps to I-605, there are five (5) general-purpose lanes and a single HOV lane in each direction. There is a southbound auxiliary lane from the SR-22 (7th Street) entrance ramp to the Seal Beach Boulevard exit ramp. There are also auxiliary lanes in the I-605 interchange area.

Caltrans has prepared detailed engineering for auxiliary lanes between Beach Boulevard and Magnolia Street in both directions. There is sufficient width to provide an auxiliary lane at the southbound direction between the Magnolia Street on-ramp and the Warner Avenue off-ramp. However, the length of the section is too short to be striped as an auxiliary lane based on Caltrans standards, so the section has a wider than typical outside travel lane. Caltrans has conducted Project Study Reports for auxiliary lanes and other improvements at the following locations:

- Magnolia Street to Brookhurst Street southbound (EA 0C760K);
- Brookhurst Street to Warner Avenue northbound (EA 0C770K)
- Ellis Street/Euclid Avenue to Brookhurst Street northbound (EA0C780K)
- Talbert Avenue to Ellis Street/Euclid Avenue southbound (EA 0C790K)