11-SD-15, 78
PM R30.6/R32.0 (15)
PM 12.6/R16.7 (78)
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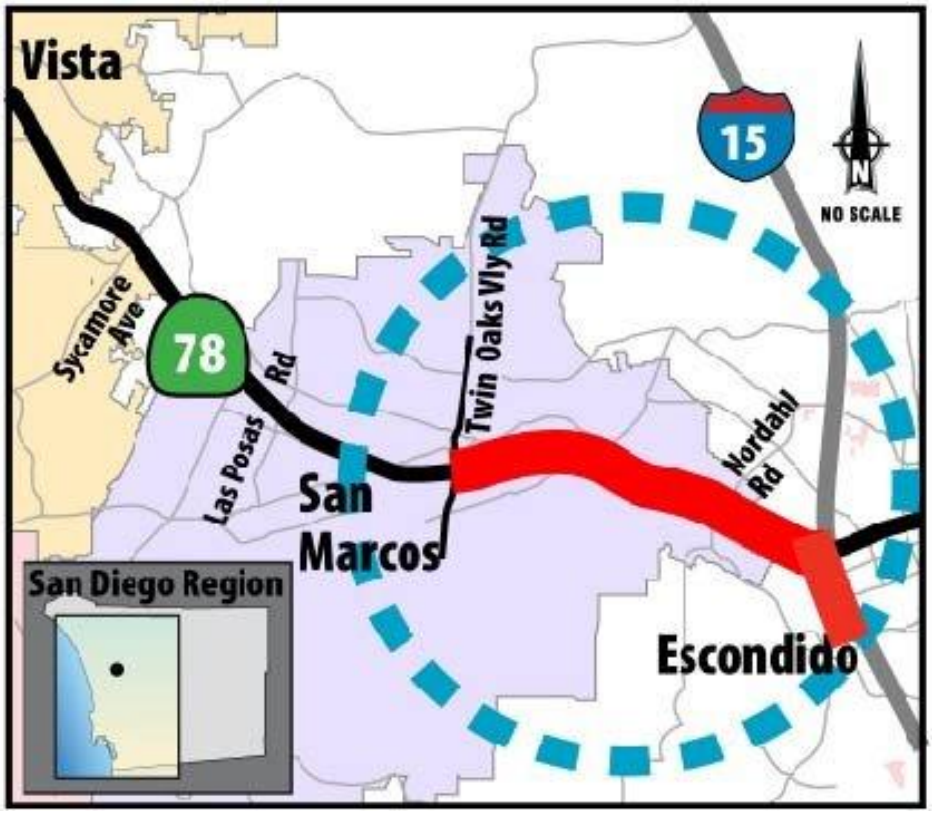
1112000131

Project Study Report-Project Development Support (PSR-PDS)

To

Request Programming for Capital Support (Project Approval and Environmental Document Phase) in the 2016 STIP



In San Diego County in and near Escondido and in San Marcos On Route 15 from 0.4 Mile South of Hale Avenue Undercrossing To 0.5 Mile North of the Route 15/78 Separation and On Route 78 From 0.3 Mile West of Twin Oaks Valley Road Overcrossing To 0.2 Mile West of the Rock Springs Road Overcrossing.

11-SD-15, 78
PM R30.6/R32.0 (15)
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SUBMITTED BY:

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11-SD-15, 78
PM R30.6/R32.0 (15)
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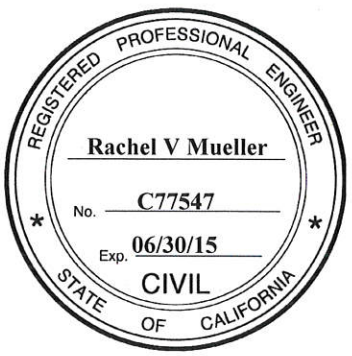
This project study report-project development support has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

REGISTERED CIVIL ENGINEER *DATE* 3/23/15



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1. INTRODUCTION

This Project Study Report-Project Development Support (PSR-PDS) report proposes the construction of direct connector lanes between Interstate 15 (I-15) and State Route 78 (SR-78) for Managed Lane vehicular traffic, which would utilize either the High Occupancy Vehicle (HOV) or Express Lanes lane management systems. This direct connector will interconnect the existing I-15 Express Lanes with the proposed future managed lane facility on SR-78 from the Twin Oaks Valley Road Overcrossing (OC) to the I-15 junction (Exhibit 1).

Operational improvements within the project limits are also proposed. These improvements include auxiliary lane construction, bridge replacement, bridge widening, ramp relocations, and street realignments (Exhibit 2a).

This report is seeking the authorization of **$6.96 million** to complete the Project Approval/Environmental Document (PA/ED) phase of this project.

Construction is anticipated by **FY 2023/24**.

Project Limits	11-SD-15, 78 PM R30.6/R32.0 (15); PM 12.6/R16.7 (78)
Number of Alternatives	3
Current Capital Outlay Support Estimate for PA&ED ($1,000)	$6,964
Current Year Capital Outlay Construction Cost Range ($1,000)	$190,840
Current Year Capital Outlay Right-of-Way Cost Range ($1,000)	$17,336
Funding Source	TransNet, Federal, STIP
Type of Facility	6 Lane Freeway/Expressway
Number of Structures	4
Anticipated Environmental Determination or Document	CEQA – Initial Study/Environmental Assessment (IS/EA) Finding of No Significant Impacts & NEPA – Mitigated Negative Declaration
Legal Description	In San Diego County in and near Escondido and San Marcos On Route 15 From 0.4 Mile South of Hale Avenue Overcrossing to 0.5 Mile North of the Route 15/78 Separation and On Route 78 From 0.1 West of Twin Oaks Valley Road Overcrossing to 0.2 Mile West of the Rock Springs Road Overcrossing.
Project Development Category	Category 3

The remaining capital outlay costs for support, right-of-way, and construction are based on preliminary estimates and are not suitable for programming purposes.

A subsequent Project Report (PR) or Supplemental Project Initiation Document (PID) in a PSR format will serve as a programming document for the remaining support costs and construction

costs. A Project Report will serve as approval for the alternative selected. No other approvals are currently required.

The project limits, shown in the previous table, were set at the eastern end of the Twin Oaks Valley Road interchange in order to minimize the congestion along the SR-78 main lanes. By providing the proposed managed lanes and connector, managed lane traffic could avoid the weaving and queuing that occurs as vehicles enter and exit the facility at the existing interchanges. The work limits shown in Exhibit 1 were approximated to only account for construction signing and striping at this time. During the Project Approval and Environmental Document (PAED) and design phases, the permanent signage needed for the SR-78 managed lanes, which would be placed along both I-15 and SR-78, would need further evaluation to determine the actual working limits for the project.

Within the limits of this project, the City of San Marcos is at the design phase for the proposed Barham Drive/Woodland Parkway interchange and local street improvement project, which has a total estimated current cost of $35 million to $40 million. Improvements include the replacement of the existing Woodland Parkway Undercrossing, BR No. 57-389, the widening and realigning of local streets in the immediate interchange area, realigning both westbound ramps and eastbound off-ramp, and signalizing ramp and local street intersections. (Exhibit 2b).

In the event that the City of San Marcos does not obtain the funding needed for their proposed local improvements project, the estimate for this project includes the cost of the Woodland Parkway bridge replacement and the existing off-ramp realignments, which is estimated at $15 million to $20 million. Improvements to the local streets, Barham Drive and Woodland Parkway, are not included in this project's estimate or in the estimate values stated in the table above since these project features are not within the scope of this project.

2. BACKGROUND

Existing Facilities

State Route 78 (SR-78) is the principal east-west route in the north county region of San Diego. This route serves interregional, intraregional, commuter and recreational travelers as well as interregional goods movement. In San Diego County, SR-78 traverses the cities of Oceanside, Vista, San Marcos, Escondido and a portion of San Diego. SR-78 also serves the communities of Ramona, Julian and provides a northerly extension to Borrego Springs. The western freeway portion of the route between Oceanside and Escondido is a major commuter route. The remainder of the route in San Diego County serves outlying rural communities and recreational

areas, including the Cleveland National Forest, Cuyamaca Rancho State Park and Anza-Borrego State Park.

From Interstate 5 in Oceanside to Interstate 15 in Escondido, SR-78 is a six-lane freeway. The closest parallel state routes to SR-78 in San Diego County are SR-76, which varies between 2 and 15 miles to the north, and SR-56, which is 15 miles to the south.

Portions of the SR-78 freeway between I-5 and I-15 currently experience traffic congestion and delay at peak periods. There has been significant growth in population, employment, and housing in the jurisdictions adjacent to the SR-78 corridor. An increased number of traffic generators along the corridor, such as schools, hospitals and both local and regional shopping and recreational activities have further contributed to traffic congestion in the SR-78 corridor. In addition, there is currently a very limited north/south and east/west arterial network that lacks sufficient connectivity with SR-78, particularly in the portion of SR-78 near I-15.

SR-78 was added to the Freeway and Expressway System in 1959, is a part of the National Highway System (NHS), and is a designated route in the National Network of Surface Transportation Assistance Act (STAA), which is a route system federally designated for use by larger trucks. For maintenance programming proposes SR 78 located within the project limits has been classified as Maintenance Service Level (MLS) 2. The functional classification for SR-78, from I-5 to Centre City Parkway in Escondido, is listed as a Principal Arterial – Other Freeway or Expressway.

Interstate 15/State Route 15 (I-15/SR-15) is a principal north/south freeway serving the inland portion of San Diego County, providing movement of commuter, regional, and interregional traffic (For discussion purposes, I-15/SR-15 will be identified as I-15 for the rest of this report). I-15 serves as an interregional route for travel and goods movement by linking the San Diego metropolitan area with Mexico to the south, and the Riverside/San Bernardino area to the north, continuing in a northeasterly direction to Las Vegas. I-15 serves regional travel needs by serving the Cities of San Diego, San Marcos, Poway, Escondido, and the unincorporated communities of Bonsall, Fallbrook and Rainbow. I-15 is a heavily utilized commuter route providing access to the growing residential communities of Tierrasanta, Mira Mesa, Scripps Ranch, Rancho Penasquitos, Sabre Springs, Carmel Mountain Ranch, Poway, Escondido, and Rancho Bernardo.

The proposed connector is listed as the top priority among HOV Connector projects in the San Diego Association of Governments (SANDAG) 2050 Regional Transportation Plan (2050 RTP), with an estimated cost of $105 million, and is currently scheduled for construction by the year 2020.

The TransNet Extension Ordinance and Expenditure Plan listed the proposed managed lane connector under Interstate 15 improvements and provided a capital cost estimate of $200 million, which included $3 million for mitigation costs. For SR-78, a total capital cost estimate of $500 million was provided for the proposed managed lanes from I-5 to I-15, and this project would utilize a portion of this capital cost.

Recently Completed Projects

The portion of SR 78 between the Barham/Woodland interchange and I-15 has been one of the most congested freeway segments in the county. In 2012 and 2013, SANDAG, Caltrans and the Cities of San Marcos and Escondido worked together to address the various bottlenecks on SR-78.

Three projects valued at $41 million were initiated in order to ease morning and evening congestion:

- Nordahl Road Overcrossing Bridge Replacement (EA 273404): This project replaced the existing Nordahl Road overcrossing structure to accommodate additional local street traffic and to provide for a higher vertical clearance above SR-78. Additional lanes were added to the on-ramps and off-ramps to provide vehicular storage. The new bridge is wide enough to accommodate future additional lanes on SR-78. The bridge was reopened to traffic in November 2012.

- Westbound SR-78 Lanes (EA 293104): Completed in January 2012, this project widened the connecting on-ramp from I-15, adding a fifth westbound lane from the connector to Nordahl Road and adding a lane to the westbound Nordahl Road off-ramp.

- Eastbound SR-78 Auxiliary Lanes (EA 404504): This project added two eastbound auxiliary lanes to improve the Level of Service (LOS) at the weaving section between the Barham Drive on-ramp and the Nordahl Road off-ramp, which was operating at LOS F prior to construction. The first auxiliary lane begins at Woodland Parkway and continues eastward past the Barham Drive on-ramp. At this on-ramp, a second auxiliary lane was constructed. Both lanes terminate at the Nordahl Road off-ramp. After construction was completed in April 2013, this weaving segment has been operating at LOS D.

Caltrans completed construction on a 20-mile I-15 Express Lanes facility between SR 163 and SR 78 that was completed in January 2012. These managed lanes are mostly within the existing I-15 median, though some outside widening was required. This facility allows entry and exit openings at two to three-mile intervals into the managed lanes, with preference given to High

Occupancy Vehicles (HOV), such as buses and carpools. The I-15 Express Lanes features four lanes with a moveable barrier for maximum flexibility (similar to the moveable barriers on the San Diego-Coronado Bridge); multiple access points to the general purpose highway lanes; and direct access ramps for high-frequency Bus Rapid Transit (BRT) service.

The innovative Express Lanes provides vanpools, carpools, buses, and FasTrak® customers with a smoother trip along the booming corridor and also relieves demand on the general purpose lanes.

The Express Lanes were constructed in three segments. The Middle Segment was the first to be constructed and opened to traffic in two phases. The first phase from SR-56 to Rancho Bernardo Road opened in September 2008. The second phase from Rancho Bernardo Road to Centre City Parkway opened in early 2009. The North Segment and the South Segment opened to traffic in 2011 and 2012, respectively.

In July 2012, construction began on new Bus Rapid Transit (BRT) services along the I-15 Express Lanes, from the junction with State Route 163 to SR-78. These high-frequency express bus services are the first of their kind in San Diego and are operated by the Metropolitan Transit System (MTS). Direct Access Ramps (DARs) connect the new and recently upgraded BRT stations and their Park and Ride lots to the Express Lanes. BRT services began in the summer of 2014.

Proposed Future Projects

Two additional projects are listed in the 2050 RTP for SR-78. In the first project, two managed lanes and various operational improvements are proposed to be constructed along SR-78 from I-5 to I-15. The second project would construct freeway and HOV connectors between I-5 and SR-78 by year 2035.

The 2050 RTP also lists future work on the I-15 corridor, which includes the addition of four toll lanes from SR-78 to the Riverside County line under its Revenue Constrained Plan. The total cost for this future project is estimated at $1 billion and is proposed to be built by year 2050.

A City of San Marcos project (EA 18703) proposes to modify the existing Woodland Parkway interchange, including the replacement of the Woodland Parkway undercrossing (Exhibit 2b). The project also proposes widening and realignment of local streets within their project limits, and ramp modifications to the westbound and eastbound off-ramps. This project will not only improve the circulation of local traffic, but it will also provide the necessary structure width for implementation of this project's managed lane direct connector.

3. PURPOSE AND NEED

Purpose

The purpose of this project is to improve the overall movement of people and goods between I-15 and SR-78 by implementing the most cost effective strategies while minimizing impacts to the surrounding communities. This is achieved through the reduction of travel times, improved highway operations and enhanced regional traffic circulation.

The project improvements are intended to increase capacity by adding lanes and widening the roadway. Additional improvements to adjacent roadways would improve operations, access to the freeway, and improved local circulation. The operational goals of this project can be achieved by adding project features such as auxiliary lanes, ramp realignment, ramp relocation, and realignment/relocation of local streets and intersections.

The goals for this project include:

- Provide HOV system connectivity between the I-15 Express Lanes and the future SR-78 managed lanes.
- Reduce congestion caused by I-15 Express Lanes traffic exiting the managed lane facility at the Citracado Parkway Intermediate Access Point (IAP) that must weave through the general purpose lanes to access the I-15/SR-78 connector.
- Provide improved access for SR-78 HOV and/or FasTrak traffic to enter the I-15 Express Lanes.
- Reduce congestion on SR-78 general purpose lanes.
- Improve local access at the Woodland/Barham interchange in support of recent and planned development in the City of San Marcos.

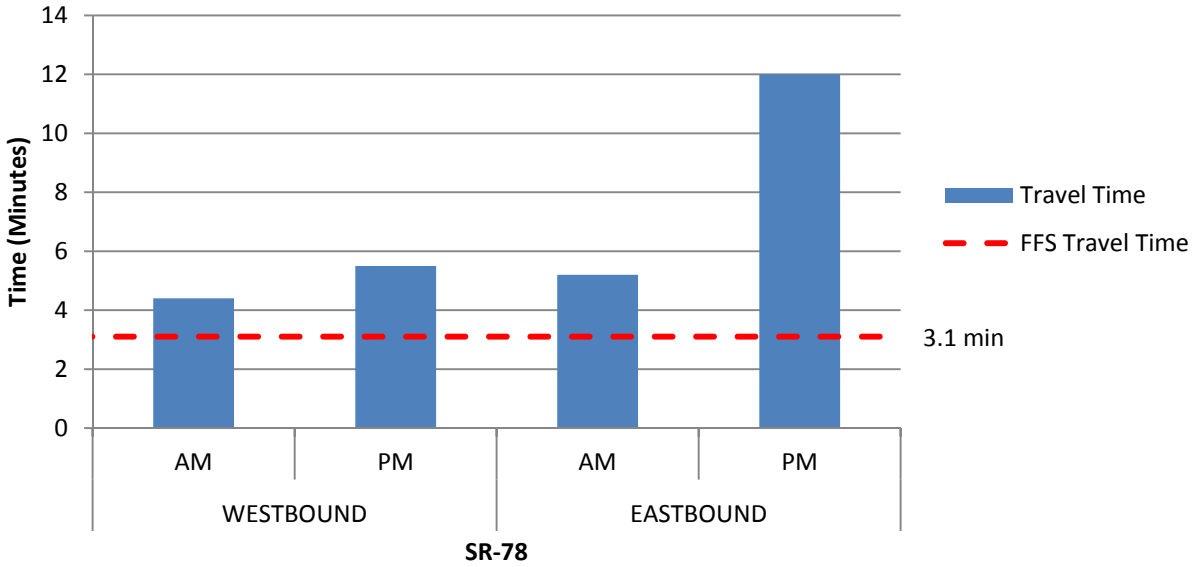
Need

Portions of the SR-78 freeway between I-5 and I-15 currently experience traffic congestion and delay at peak periods. There has been significant growth in population, employment, and housing in the jurisdictions adjacent to the SR-78 corridor and the northern section of I-15, which has contributed to an increase in commuter and commercial trips along both corridors. An increased number of traffic generators along the SR-78 corridor, such as schools, hospitals and both local and regional shopping and recreational activities have further contributed to traffic congestion. Currently, there are limited north/south and east/west arterial networks, which lack sufficient connectivity with SR-78, particularly along the section of SR-78 near I-15.

In 2013, traffic volumes for the peak hours range from approximately 5,000 to 6,500 vehicles along each of the SR-78 freeway segments between San Marcos Boulevard and the 15/78 Separation. Traffic volumes along I-15 from Auto Parkway to the 15/78 Separation range from approximately 4,000 to 8,900 vehicles during the peak hours. The increase in traffic generators along SR-78 and I-15 have contributed to heavy use of the north to west and east to south connectors at the 15/78 Separation. Almost half of the total traffic volume on northbound I-15 transitions to westbound SR-78, and over 60% of the total traffic volume driving on eastbound SR-78 uses the I-15 southbound connector. It is anticipated that within the year the east to south connector will have reached its capacity of 4,000 vehicles per hour during the PM peak period. Between 2020 and 2023, the north to west connector will have also reached its full capacity.

During free flow speeds (FFS), calculated using the 2000 Highway Capacity Manual method, travel times along SR-78 between San Marcos Boulevard and Nordahl Road are estimated at 3.1 minutes for both directions. In the westbound direction, during peak hours, travel times are 4.4 minutes in the AM peak hour and 5.5 minutes in the PM peak hour, which shows a delay of 1.3 minutes and 2.4 minutes, respectively, when compared to FFS. In the eastbound direction, the AM peak hour travel time is 5.2 minutes, and the travel time in the PM peak hour is 12.0 minutes. When compared to the FFS, the delay in the eastbound direction is 2.1 minutes in the AM peak hour and 8.9 minutes in the PM peak hour. These existing travel times and FFS are shown graphically in Figure 1.

Figure 1
Existing Travel Times
Between San Marcos Blvd and Nordahl Rd



The Managed Lane concept is an operational practice utilized to address congestion by controlling movement on the highway. Two common approaches to lane management are restricted use based on vehicle eligibility and control of access through limited ingress/egress. Vehicle eligibility is based on occupancy or vehicle type. California's Managed Lanes are comprised of High Occupancy Vehicle (HOV) lanes, Express Lanes and Park and Ride facilities.

The HOV lane, also known as the carpool or diamond lane, is a traffic management strategy to encourage ridesharing, which alleviates congestion and maximizes the people-carrying capacity of California highways. The goals of the HOV lane are to provide an express service incentive for motorists to carpool, thereby, reducing congestion. Express lanes provide a managed approach to improving system performance and reliability, optimizing use of capacity, and creating new sources of revenue to further improve transportation in the corridor, including transit. Also known as High Occupancy Tolling (HOT) lanes, express lanes provide preferential access for eligible vehicles, such as high occupancy vehicles and certain low emission vehicles, and/or for fee payment by FasTrak users.

This project would utilize the Managed Lane operational concept through implementation of one of the two lane management strategies, HOV lane or express lane, to reduce the demand on the existing I-15/SR-78 connectors by providing dedicated lanes for managed lane traffic to transition between the I-15 Express Lanes and the proposed future SR-78 Managed Lane project. The use of lane management strategies and congestion pricing would reduce congestion in the general purpose and connector lanes by allowing some general purpose vehicles with FasTrak transponders to use excess capacity in the managed lane connector. Motorists in the general purpose lanes will also benefit from the reduction of vehicles in the main lane.

Construction of the proposed connector, along with the proposed managed lanes, would reduce congestion on the existing general purpose connectors and allow them to operate under capacity beyond the forecasted year of 2020. Along with reducing congestion, this project would also enhance safety by minimizing the weaving that occurs as HOV and/or FasTrak vehicles transition between I-15 and SR-78 and by minimizing the amount of vehicles in the queue at the existing northbound and southbound I-15/SR-78 connectors. Construction of the proposed managed lane connector would allow HOV and/or FasTrak users to stay in the managed lanes as they transition between I-15 and SR-78.

In the northbound I-15 direction, vehicles traveling on the I-15 Express Lanes must exit these lanes to travel towards the existing I-15 to SR-78 connectors. The existing intermediate access point (IAP), where vehicles currently exit the express lanes, is at the Citracado Parkway interchange, which is approximately 5,700 feet south of the 15/78 Separation. Northbound I-15 Express Lane vehicles must weave through I-15 traffic through five general purpose lanes within

this length to access the connectors. During peak hours, vehicles must join the queue that develops because of the existing bottleneck east of Nordahl Drive on-ramp and because both the northbound to westbound connector and the weave section between Nordahl Drive and the existing connector has reached capacity. This situation causes traffic to queue back onto I-15 lanes and limits the entry of additional traffic from the Valley Parkway on-ramp.

Vehicles, including HOV and FasTrak users, entering I-15 from the eastbound SR-78 connector have two weaving areas to navigate located at the diverge and merge points of the existing connector. Along SR-78, traffic heading to southbound I-15 has approximately 2,000 feet to complete the weaving maneuver over one to two lanes to reach the existing two-lane connector's entrance. Within this same section, traffic entering from the eastbound Nordahl Drive on-ramp that want to continue onto SR-78 are weaving over two lanes of traffic to enter the general purpose lanes. The second weaving area begins at the merging point with I-15 where connector traffic must slow down to wait for gaps in I-15 traffic to enter the southbound general purpose lanes while vehicles wanting to exit to Valley Parkway are weaving through connector traffic to access the off-ramp. During peak hours, the I-15 weaving segment creates a queue on the connector which extends to the SR-78 lanes, which creates a difficult weaving situation between Nordahl Road and the connector. Managed lane traffic that wants to utilize the I-15 Express Lanes must weave through five lanes of traffic to enter at the IAP at Citracado Parkway, which is approximately 2.5 miles south of the 15/78 Separation.

4. TRAFFIC ENGINEERING PERFORMANCE ASSESSMENT

Preliminary Traffic Analysis

A preliminary traffic analysis was performed for State Route 78 and for Interstate 15, within the project limits. Peak hour volumes were analyzed for three study years: existing year (YR) 2013, YR 2020 and YR 2040 (Exhibit 9). Additional analysis was performed on traffic data that was obtained from the Caltrans Performance Measurement System, also known as PeMS. The PeMS database contains real-time traffic data from individual detectors that span the freeway system across all major metropolitan areas in the State of California and contains over ten years of historical analysis.

Since detailed traffic modeling was not available at this phase of the project to provide a unique traffic data set for each build alternative, the following analysis assumed the calculated values applied to both alternatives for the build years of 2020 and 2040. A more in-depth traffic analysis will be performed during the PAED phase, which will provide a more distinct traffic comparison between the two build alternatives.

State Route 78 (SR-78)

SR-78 is currently a six lane facility, from just east of San Marcos Creek to the I-15/SR-78 Separation. There are three general purpose lanes in each direction. There are three interchanges within the project limits at Twin Oaks Valley Road, Woodland/Barham and Nordahl Road.

Traffic congestion on SR-78 between I-5 and I-15 has been increasing due to significant increases in population, employment and residential development. This segment of the SR-78 corridor has several traffic generators that contribute to congestion, such as the California State University at San Marcos, U.S. Colleges of San Marcos, Palomar College, Palomar Hospital, commercial properties immediately adjacent to the facility, and recreational areas.

Existing Bottlenecks

Using the PeMS database, three existing bottlenecks were identified using the speed contour data. Each bottleneck is described below.

Westbound SR-78

- I-15 Connectors to Nordahl Road Off-Ramp

Traffic from I-15 enters SR-78 using two existing connectors. Southbound I-15 traffic uses a single-lane connector, and northbound I-15 traffic uses a two-lane connector. These three lanes converge and continue parallel along SR-78. The outside lane, originating at the southbound I-15 connector must exit at the Nordahl Road off-ramp. The adjacent lane, originating from the northbound I-15 connector, is an option lane where vehicles must decide to exit to the off-ramp or continue along the auxiliary lane. Traffic from southbound I-15 that wants to travel westbound on SR-78 must weave through at least one lane of traffic. Vehicles originating east of the I-15/SR-78 Separation must weave through two lanes of traffic to reach the Nordahl Road off-ramp. The weaving length between the northbound I-15 connector and the Nordahl Road off-ramp is approximately ½ mile. Constructing the proposed managed lane connector and lanes would reduce the volume of vehicles traveling on the northbound I-15 connector, which would reduce the volume of traffic in this weave and merge area.

- Auxiliary Lane at Nordahl Road

An existing auxiliary lane between the I-15 connectors and Nordahl Road interchange ends just east of the on-ramp from Nordahl Road. The ending of this lane requires vehicles to merge into the SR-78 main lanes while traffic from the on-ramp is also merging onto the SR-78. Extending this lane westerly to Twin Oaks Valley Road would provide additional capacity and eliminate the existing lane drop and merge point just east of the Nordahl Road on-ramp.

- Barham Drive /Woodland Parkway Off-Ramp

The existing Barham Drive/Woodland Parkway off-ramp is a single lane hook ramp with stop control at its terminus for vehicles wanting to turn left onto Rancheros Drive and yield control for those vehicles heading eastbound on Rancheros Drive to reach Woodland Parkway. The storage length of the ramp is short; therefore, vehicles attempting to exit at this off-ramp queue onto the westbound main lanes of SR-78. Without additional capacity, this off-ramp would continue to operate in a similar manner as the existing condition. The extension of the existing auxiliary lane from Nordahl Road to Twin Oaks Valley Road would provide additional capacity for the westbound SR-78 main lanes and would provide three lanes for through traffic to utilize if the Woodland off-ramp queues onto the fourth lane.

Eastbound SR-78

- Twin Oaks Valley Road On-Ramp

The existing Twin Oaks Valley Road on-ramp is a three-lane metered ramp. Two lanes are general purpose lanes and one lane is an HOV lane. Ramp traffic must merge into a single lane before entering SR-78. Approximately 900-1000 vehicles per hour utilize the Twin Oaks Valley Road on-ramp during the peak hours. The ramp traffic enters the eastbound SR-78 lanes on an auxiliary lane that ends just east of the existing SPRINTER structure that traverses the main lanes of SR-78. Extending the existing auxiliary lane to the Woodland Parkway off-ramp would provide more weaving length for vehicles entering the eastbound SR-78 to merge into traffic while also providing additional space for main lane vehicles to merge towards the Woodland Parkway off-ramp.

- Barham Drive/Woodland Parkway On-Ramp to Nordahl Road Off-Ramp

The Barham Drive/Woodland Parkway on-ramp is a one lane ramp, and the Nordahl Road off-ramp is a two-lane ramp. Within a distance of 2,300 feet, an outside auxiliary lane connects

these two ramps, and a second auxiliary lane begins just east of the Woodland Parkway Undercrossing and ends at the Nordahl Road off-ramp. Traffic entering from Barham Drive must weave through two lanes of SR-78 traffic that is exiting to Nordahl Road. Reconstructing the Woodland Parkway structure, which will be widened to the north and south, and relocating the Barham Drive on-ramp closer to the existing Barham Drive off-ramp would provide approximately one mile of weaving length between Barham Drive/Woodland Parkway and Nordahl Road. In addition, the construction of the eastbound managed lane would remove HOV and/or FasTrak traffic from the main lanes providing additional capacity on the SR-78 main lanes, which would provide more gaps for weaving traffic to utilize.

Peak Hour Traffic Volumes and Volume-to-Capacity (v/c) Ratios

The following tables show the peak hour volumes and volume-to-capacity (v/c) ratios for existing YR 2013 and for the No Build, Build YR of 2020 and Horizon YR 2040 for both the westbound and eastbound directions. Within the project limits, SR-78 was divided into four segments for a more detailed analysis. The segment from San Marcos Boulevard to Twin Oaks Valley Road was included for completeness since the project limits start just east of the interchange at SR-78 and Twin Oaks Valley Road.

Westbound SR-78

As shown in Table 1, for the westbound direction of SR-78, the existing YR 2013 peak hour volumes for range from approximately 5,700 vph to 6,500 vph. In the existing YR 2013, Table 1 also shows that the v/c ratios are above 1.0 between Twin Oaks Valley Road and Nordahl Road for both peak periods.

Table 1
Westbound SR-78 Peak Hour Volumes and v/c Ratios
For Existing and No Build Scenarios

Segment Along SR-78	Peak Hour	YR 2013 Existing		YR 2020 No Build		YR 2040 No Build	
		Volume	v/c Ratio	Volume	v/c Ratio	Volume	v/c Ratio
San Marcos Blvd to Twin Oaks Valley Rd	AM	6030	0.80	6790	0.91	8310	**1.11**
	PM	5740	0.76	6470	0.86	7890	**1.05**
Twin Oaks Valley Rd to Woodland/Barham	AM	6310	**1.05**	7100	**1.18**	8690	**1.45**
	PM	6060	**1.01**	6830	**1.14**	8330	**1.39**
Woodland/Barham to Nordahl Rd	AM	6160	**1.03**	6930	**1.16**	8480	**1.41**
	PM	5990	**1.00**	6750	**1.13**	8230	**1.37**
Nordahl Rd to I-15/SR-78 Separation	AM	6500	0.74	7320	0.83	8940	**1.02**
	PM	6190	0.70	6970	0.79	8510	0.97

In the No Build years of 2020 and 2040, without any improvements, the peak hour volumes will continue to increase, with a range of 6,470 vph to 8,940 vph, and congestion will substantially worsen. Between Twin Oaks Valley Road and Nordahl Road, where two existing bottlenecks are located, the v/c ratios for the YR 2020 and YR 2040 No Build scenarios are above 1.0, which indicates that the system is operating at capacity levels and the westbound lanes will be operating in breakdown conditions with low speeds, fewer gaps to maneuver into, long queues, and with the occurrence of complete stops in traffic flow.

Between Nordahl Road off-ramp and the I-15 connectors, the existing cross section includes five lanes. Although the higher number of lanes may imply adequate capacity, this segment has significant merge and weave movements as traffic from the I-15 connectors are trying to weave and merge into the SR-78 through lanes and traffic traveling on SR-78 from the east are attempting to exit at Nordahl Road off-ramp. The v/c ratios used a lower capacity to account for these movements and provide a more realistic operation analysis. As shown in Table 1, by the No Build YR 2040, this segment will be operating at its capacity levels.

Table 2 provides the westbound peak hour volumes and v/c ratios for the Build YR 2020 and the Horizon YR 2040. In this Build option, the predicted traffic volumes that will utilize the proposed managed lanes along SR-78 have reduced some of the demand on the main lanes. In addition, the extension of the existing auxiliary lane between Nordahl Road and Twin Oaks Valley Road also provides extra capacity for westbound general purpose traffic.

When compared to the No Build values in Table 1, the main lane v/c ratios for the Twin Oaks Valley Road to Nordahl Road section that were at 1.0 or higher are now shown to range between 0.75 and 0.90, which indicates that the main lanes of SR-78 would operate under capacity for the Build YR 2020 and the Horizon YR 2040. The segment between Nordahl Road and the I-15 connectors also shows improvement. For the Horizon YR 2040, the v/c ratios were shown to be at the same levels as the No Build YR 2020, which indicates that this segment, in the build scenario, would be able to handle additional traffic demand well beyond YR 2040.

Table 2
Westbound SR-78 Peak Hour Volumes and v/c Ratios
For Build YR 2020 and Horizon YR 2040

Segment Along SR-78	Peak Hour	YR 2020 Build				YR 2040 Horizon Years			
		Main Lane		Managed Lane		Main Lane		Managed Lane	
		Volume	v/c Ratio	Volume	v/c Ratio	Volume	v/c Ratio	Volume[1]	v/c Ratio
San Marcos Blvd to Twin Oaks Valley Rd	AM	6790	0.91	-	-	6530	0.87	1600[2]	**1.00**
	PM	6470	0.86	-	-	6290	0.84	1600[2]	**1.00**
Twin Oaks Valley Rd to Woodland/Barham	AM	6420	0.80	680	0.43	7090	0.89	1600	**1.00**
	PM	6090	0.76	740	0.46	6730	0.84	1600	**1.00**
Woodland/Barham to Nordahl Rd	AM	6290	0.79	680	0.43	6880	0.86	1600	**1.00**
	PM	6010	0.75	740	0.46	6630	0.83	1600	**1.00**
Nordahl Rd to I-15/SR-78 Separation	AM	6640	0.75	680	0.43	7340	0.83	1600	**1.00**
	PM	6230	0.71	740	0.46	6910	0.79	1600	**1.00**

[1] Assumes a lane capacity of 1600 vph for managed lanes.
[2] Assumes SR-78 Managed Lanes west of the project limits are constructed.

Eastbound SR-78

For the eastbound direction of SR-78, as shown in Table 3, the existing YR 2013 peak hour volumes for range from approximately 5,030 vph to 6,150 vph. Only the Twin Oaks Valley Road to Woodland/Barham segment is nearing capacity in the existing condition, with a v/c ratio of 0.95 in the PM peak hour. The other segments are currently operating at under capacity levels.

Table 3
SR-78 Peak Hour Volumes and v/c Ratios
Eastbound Direction

Segment Along SR-78	Peak Hour	YR 2013 Existing		YR 2020 No Build		YR 2040 No Build	
		Volume	v/c Ratio	Volume	v/c Ratio	Volume	v/c Ratio
San Marcos Blvd to Twin Oaks Valley Rd	AM	5370	0.72	6050	0.81	7380	0.98
	PM	5590	0.75	6310	0.84	7690	**1.03**
Twin Oaks Valley Rd to Woodland/Barham	AM	5280	0.88	5950	0.99	7250	**1.21**
	PM	5720	0.95	6450	**1.08**	7870	**1.31**
Woodland/Barham to Nordahl Rd	AM	5090	0.51	5730	0.57	6990	0.70
	PM	5900	0.59	6650	0.67	8120	0.81
Nordahl Rd to I-15/SR-78 Connectors	AM	5030	0.68	5660	0.76	6910	0.93
	PM	6150	0.83	6930	0.94	8460	**1.14**

Without any improvements, during the No Build years of 2020 and 2040, the peak hour volumes will continue to increase, with a range of 5,660 vph to 8,460 vph. For the YR 2020 No Build scenario, the v/c ratios range from 0.94 and 1.14. The Twin Oaks Valley Road to Woodland/Barham segment is operating at capacity for both peak periods, and the Nordahl Road to I-15 connector segment is operating near capacity in the PM peak period. This indicates that

this segment is significantly utilized by traffic heading to destinations within the project limits and to those along southbound I-15. In the YR 2040 No Build scenario, two segments are nearing capacity levels: between San Marcos Boulevard and Twin Oaks Valley Road and between Nordahl Road and the 15/78 connector. Between Twin Oaks Valley Road and Woodland/Barham, this segment is exceeding capacity for both AM and PM peak periods, with v/c ratios of 1.21 and 1.31, respectively. These segments will be operating in breakdown conditions with low speeds, fewer gaps to maneuver into, long queues, and with the occurrence of complete stops in traffic flow.

Table 4 provides the eastbound peak hour volumes and v/c ratios for the Build YR 2020 and the Horizon YR 2040. In this Build option, the predicted traffic volumes that will utilize the proposed managed lanes along SR-78 have reduced some of the demand on the main lanes. The construction of the proposed auxiliary lane between Twin Oaks Valley Road on-ramp and Woodland Parkway off-ramp would improve the weaving length between the two ramps. The relocation of the Barham/Woodland on-ramp westerly, closer to the existing off-ramp, will eliminate the weaving segment before the Nordahl Road off-ramp.

When compared to the No Build values in Table 3, the main lane v/c ratios for the segment between Twin Oaks Valley Road to Woodland Parkway, which were at 0.99 and higher for No Build YRs 2020 and 2040, are shown to range between 0.67 to 0.78, indicating that the main lanes of SR-78 would operate under capacity for the Build YR 2020 and the Horizon YR 2040. The segment between Nordahl Road to the southbound I-15 connector also shows improved operation for the PM peak hour with a v/c ratio of 0.93 in YR 2040, which, although it is indicates that this segment is nearing capacity, it does show that the v/c ratio is lower than the No Build ratio of 1.05 as shown in Table 3.

Table 4
Eastbound SR-78 Peak Hour Volumes and v/c Ratios
For Build YR 2020 and Horizon YR 2040

Segment Along SR-78	Peak Hour	Build YR 2020				Horizon YR 2040			
		Main Lane		Managed Lane		Main Lane		Managed Lane	
		Volume	v/c Ratio	Volume	v/c Ratio	Volume	v/c Ratio	Volume[1]	v/c Ratio
San Marcos Blvd to Twin Oaks Valley Rd	AM	6050	0.81	-	-	6320	0.84	1600[2]	**1.00**
	PM	6310	0.84	-	-	6650	0.89	1600[2]	**1.00**
Twin Oaks Valley Rd to Woodland/Barham	AM	5320	0.67	630	0.39	5650	0.71	1600	**1.00**
	PM	5670	0.71	780	0.49	6270	0.78	1600	**1.00**
Woodland/Barham to Nordahl Rd	AM	5100	0.64	630	0.39	5390	0.67	1600	**1.00**
	PM	5870	0.73	780	0.49	6520	0.82	1600	**1.00**
Nordahl Rd to I-15/SR-78 Separation	AM	5030	0.68	630	0.39	5310	0.72	1600	**1.00**
	PM	6150	0.83	780	0.49	6860	0.93	1600	**1.00**

[1] Assumes a lane capacity of 1600 vph for managed lanes.
[2] Assumes SR-78 Managed Lanes west of the project limits are constructed.

Existing Speed and Traffic Delay

For the existing YR 2013, traffic data for speed, delay and bottleneck locations were obtained from the PeMS database using data from eight vehicle detection stations (VDS), four stations in each direction, for the month of March 2013, excluding holidays and weekends. A previous year, YR 2010, was selected to compare and evaluate how SR-78 speeds and delay times have changed within a three year period. This year was chosen because it represents the SR-78 facility before improvements occurred at the Nordahl Road interchange, including bridge replacement and constructing of an auxiliary lane, and an auxiliary lane along the eastbound main lanes from Woodland Parkway to Nordahl Road. Tables 5 and 6 summarize the data for each direction of SR-78, and Exhibit 6 provides a graphical display of the existing speeds for the entire corridor. A three-hour timeframe was used in PeMS to represent the AM and PM peak traffic hours. The AM time period is from 6 am to 9 am, and the PM time period is from 3 pm to 6 pm.

Westbound SR-78

Table 5 compares the speed and delay for the four VDS within the westbound project limits of SR-78.

Table 5
SR-78 Average Speed and Delay
Westbound Direction

Westbound SR-78 Vehicle Detection Stations	AM Peak				PM Peak			
	YR 2010		Existing YR 2013		YR 2010		Existing YR 2013	
	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)
San Marcos Blvd	63	1.2	61	2.4	64	0.2	61	1.3
Twin Oaks Valley Rd	62	2.7	61	3.9	63	0.8	62	1.3
Woodland Pkwy	58	9.7	58	9.5	54	18.8	44	40.9
Nordahl Rd	45	44.2	36	94.9	49	37.0	24	156.3

For both the AM and PM peak periods, speed data for the westbound segment between San Marcos Boulevard and Twin Oaks Valley Road remained consistent, within one to two miles per hour (mph), between the two study years. At Woodland Parkway and Nordahl Road, the speeds differed for each of the peak periods. In the AM peak period, both stations displayed speeds that have decreased by 2 mph and 12 mph, respectively, since YR 2010. In the YR 2013 PM peak period, speeds increased by 10 mph and 25 mph at Woodland Parkway and Nordahl Road, respectively.

Speeds increased between Nordahl Road and Mission Avenue due to the completion of the Nordahl Road Overcrossing bridge replacement (EA 23400) project. The existing bottleneck just east of the Nordahl Road on-ramp, where 4 lanes taper down to 3 lanes, limits the amount of traffic approaching the Mission Road Overhead, which increases speed downstream of the bottleneck. Speeds then decrease at Woodland Parkway primarily because of the bottleneck created by the Woodland Parkway single lane off-ramp. Traffic queues up on the ramp, which decreases speed on the SR-78 main lanes as through traffic must slow down. Using the PeMS database to study speed contour data, two bottleneck locations were identified. One location was near the I-15 to SR-78 westbound connector and the Nordahl off-ramp. The second location was at the Woodland Parkway off-ramp.

The traffic delay in the AM peak hour shows that for a 2 mph decrease in speed at San Marcos Boulevard and Woodland Parkway, delay increased by 157 vehicle-hours (Veh-hrs) and 396 Veh-hrs, respectively. For Twin Valley Oaks Road, in the AM peak period, delay increased by 26 Veh-hrs with a 1 mph decrease in speed, and for Nordahl Road, a 12 mph decrease in speed resulted in 2,258 Veh-hrs of delay.

At the segments of Woodland Parkway and Nordahl Road, drivers experienced an average of 22 seconds and 53 seconds, respectively, of additional delay in YR 2013 during the 5 pm peak hour. Between Nordahl Road and Woodland Parkway, the variation in speed and the increase in delay indicate that additional operational improvements are needed along the westbound direction.

An operation improvements project between the westbound I-15/SR-78 connector and the Nordahl Road off-ramp improved the congestion issues at the terminus of the connector, but it did not improve the congestion from the bottleneck just west of the Nordahl Road interchange.

Eastbound SR-78

Table 6 compares the speed and delay for the peak hours for the four VDS within the eastbound project limits of SR-78.

Table 6
SR-78 Average Speed and Delay
Eastbound Direction

Eastbound SR-78 Vehicle Detection Stations	AM Peak				PM Peak			
	YR 2010		Existing YR 2013		YR 2010		Existing YR 2013	
	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)
San Marcos Blvd	62	2.3	54	25.2	24	116.9	13	195.9
Twin Oaks Valley Rd	61	6.7	49	55.0	24	154.0	15	239.4
Woodland Pkwy	55	2.2	47	34.7	28	132.3	34	72.0
Nordahl Rd	51	42.8	55	25.4	52	21.2	57	8.9

For the AM peak period, speed for the three of the four eastbound segments decreased by approximately 8 mph and 12 mph. Average traffic delay in the AM peak hour indicates that traffic delay between San Marcos Boulevard and Woodland Parkway is increasing by approximately 23 Veh-hrs and 48 Veh-hrs.

Speeds at Nordahl Road increased by 4 mph due to the addition of an auxiliary lane between Woodland Parkway and Nordahl Road. Delay at Nordahl Road has decreased by 17 Veh-hrs, which is due to the additional auxiliary lane constructed in May 2013.

In the PM peak period, speeds at San Marcos Boulevard and Twin Oaks Valley Road were at or below 25 mph for both study years. Both segments decreased by 11 mph to 8 mph, respectively, between YR 2010 and existing YR 2013. The Twin Valley Oaks Road on-ramp adds over 1,000 vehicles to the main lanes. Even with the existing acceleration lane, the three eastbound main lanes of SR-78 cannot adequately absorb that amount of incoming vehicles during the PM peak hour. This lack of capacity keeps the speeds below 25 mph until the Woodland Parkway off-ramp removes some of the traffic on SR-78. Looking at the PeMS speed contour data, a bottleneck location was observed at Woodland Parkway for both the AM and PM peak hours.

Traffic delay is significantly increasing between San Marcos Boulevard and Twin Oaks Valley Road with an increase of 79 Veh-hrs and 85 Veh-hrs, respectively. This delay is due to the bottleneck at the Twin Oaks Valley on-ramp. The volume of entering vehicles is above 1,000 vph, and this traffic must weave through exiting traffic attempting to reach the off-ramp at the Twin Oaks Valley Road interchange.

Between Woodland Parkway and Nordahl Road speeds have increased by 6 mph and 5 mph, respectively. These improvements coincide with a recent operational improvement project (EA 404504) that opened in May 2013. This project added an auxiliary lane between Woodland Parkway and the Nordahl Road interchange. At Woodland Parkway and Nordahl Road, Table 6

displays a decrease in delay of 60 Veh-hrs and 12 Veh-hrs, respectively, and is due to the addition of the auxiliary lane between the two interchanges.

At San Marcos Boulevard, Twin Oaks Valley Road and Woodland Parkway, drivers are experiencing an increase in delay times. In the 8 am hour, San Marcos Boulevard, Twin Oaks Valley Road and Woodland Parkway had an additional AM delay of approximately 2 minutes. For the 5 pm hour, San Marcos Boulevard and Twin Oaks Valley Parkway drivers are experiencing an additional 3 minutes of delay. Woodland Parkway experiences an increase in delay of slightly less than a minute.

Interstate 15 (I-15)

I-15 is a 14 lane facility from Valley Parkway to I-15/SR-78 connector. In the northbound direction there are five general purpose lanes and two express lanes from Valley Parkway to the I-15/SR-78 Separation. In the southbound direction, there are five general purpose lanes and two express lanes from Valley Parkway to the I-15/SR-78 Separation.

Peak Hour Traffic Volumes and Volume-to-Capacity (v/c) Ratios

The following tables show the peak hour volumes and volume-to-capacity (v/c) ratios for existing YR 2013, No Build YRs 2020 as well as the Build YR 2020 and Horizon YR 2040 for both the northbound and southbound directions of I-15. Within the project limits, this section of I-15 was divided into three freeway segments for a more detailed analysis. The I-15/SR-78 connector was also included within this analysis.

Northbound I-15

Table 7 contains the peak hour volumes and v/c ratios for the northbound direction of I-15 from Auto Parkway/9th Avenue interchange to the I-15/SR-78 connector.

Table 7
I-15 Peak Hour Volumes and v/c Ratios
Northbound Direction

Segment Along I-15	Peak Hour	YR 2013 Existing		YR 2020 No Build		YR 2040 No Build	
		Volume	v/c Ratio	Volume	v/c Ratio	Volume	v/c Ratio
Auto Pkwy/9th Ave to Valley Pkwy	AM	4130	0.51	4470	0.56	5460	0.68
	PM	5760	0.72	6240	0.78	7610	0.95
Valley Pkwy to 15/78 Connector	AM	5090	0.50	5510	0.54	6730	0.66
	PM	7120	0.70	7710	0.76	9410	0.92
15/78 Connector to 15/78 Separation	AM	1420	0.18	1540	0.19	1880	0.24
	PM	3930	0.49	4260	0.54	5190	0.65
NB I-15 Express Lanes (Valley Pkwy to Connector)	AM	310	0.10	340	0.11	410	0.13
	PM	1680	0.53	1820	0.57	2220	0.69
NB I-15 to WB 78 Connector	AM	3360	0.84	3640	0.91	4440	**1.11**
	PM	3660	0.92	3960	0.99	4840	**1.21**

Since the North Segment of I-15 Managed Lanes project was completed in 2011, the four general purpose lanes of I-15 have sufficient capacity to handle traffic volumes until the YR 2040. Only one segment in the PM peak hour has a volume above 9,000 vph and a v/c ratio of 0.92, which means that the segment would be nearing capacity in YR 2040.

The I-15 Express Lanes are currently operating under capacity for both peak periods. For both future No Build years 2020 and 2040, there is unused capacity on these lanes.

As seen in Table 7, the existing northbound I-15 to westbound SR-78 connector is operating slightly under capacity in the PM peak hour in YR 2013 and for both peak hours in YR 2020. In YR 2040, the existing connectors are predicted to operate at over capacity levels. With no improvements to help relieve congestion, this connector will operate at breakdown conditions with long queues that will have traffic lining up on the northbound I-15 lanes.

Southbound I-15

Table 8 contains the peak hour volumes and v/c ratios for the southbound direction of I-15 from Auto Parkway/9th Avenue interchange to the I-15/SR-78 connector.

Table 8
I-15 Peak Hour Volumes and v/c Ratios
Southbound Direction

Segment Along I-15	Peak Hour	YR 2013 Existing		YR 2020 No Build		YR 2040 No Build	
		Volume	v/c Ratio	Volume	v/c Ratio	Volume	v/c Ratio
Auto Pkwy/9th Ave to Valley Parkway	AM	7830	0.78	8480	0.85	10350	**1.04**
	PM	6810	0.68	7370	0.74	9000	0.90
Valley Parkway to 15/78 Connector	AM	8850	0.87	9580	0.94	11700	**1.15**
	PM	7760	0.76	8400	0.82	10250	**1.00**
15/78 Connector to 15/78 Separation	AM	7370	0.74	7980	0.80	9740	0.97
	PM	4300	0.43	4660	0.47	5680	0.57
SB I-15 Express Lanes (Valley Pkwy to Connector)	AM	1970	0.61	2130	0.72	2600	0.81
	PM	510	0.16	550	0.17	670	0.21
EB 78 to SB I-15 Connector	AM	3100	0.78	3360	0.84	4100	**1.03**
	PM	3860	0.97	4180	**1.05**	5100	**1.28**

Volumes along the southbound lanes of I-15 from Auto Parkway to eastbound SR-78 to southbound I-15 connector steadily increase throughout the No Build study years. With the completion of the I-15 Managed Lanes project, the five existing general purpose lanes will operate under capacity for YR 2020. In the No Build YR 2040, the segment between Auto Parkway/9th Avenue and Valley Parkway will operate at capacity in the AM peak hours and near capacity in the PM peak hour. The segment between Valley Parkway and the southbound connector from SR-78 will operate at full capacity for both peak periods.

The southbound I-15 Express Lanes are currently operating under capacity for both peak periods. For both future No Build years of 2020 and 2040, there is unused capacity on these lanes.

As seen in Table 8, the existing eastbound SR-78 to southbound I-15 connector is operating slightly under capacity in the PM peak hour in YR 2013. In the PM peak hour of No Build YR 2020, the connectors are at capacity, and in No Build YR 2040, with no improvements, the connector will be operating at capacity or breakdown conditions with long queues that will have traffic lining up onto the eastbound lanes of SR-78.

Existing Speed and Traffic Delay

For the existing YR 2013, traffic data for speed, delay and bottleneck locations were obtained from the PeMS database using data from ten vehicle detection stations (VDS), five stations in each direction, for the month of March 2013, excluding holidays and weekends. Two stations, outside of the project limits, were included to study the speed and delay data on the general

purpose lanes immediately before and after the existing intermediate access point at Citracado Parkway for the I-15 Express Lanes.

A previous year, YR 2010, was selected to compare and evaluate how I-15 speeds and delay times have changed within a three-year period. This year was chosen to coincide with the study years for SR-78 roadway. Tables 9 and 10 summarize the data for each direction of I-15. The AM peak hour used was 8 am, and the PM peak hour was 5 pm.

Northbound I-15

Table 9 compares the speed and delay for the peak hours for the five VDS along the northbound lanes of I-15 from Via Rancho Parkway to the northbound I-15 to westbound SR-78 connector.

Table 9
I-15 Average Speed and Delay
Northbound Direction

Northbound I-15 Vehicle Detection Stations	AM Peak				PM Peak			
	YR 2010		Existing YR 2013		YR 2010		Existing YR 2013	
	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)
Via Rancho Pkwy	67	0.5	64	5.2	46	85.6	62	4.4
Citracado Pkwy	67	2.4	66	2.5	33	265.9	63	20.4
Auto Pkwy/9th	49	23.4	64	2.5	47	34.3	56	34.3
Valley Pkwy	61	10.1	61	18.2	66	4.4	54	59.8

In the AM peak hour, speeds decreased slightly from 1 to 3 mph at Via Rancho Parkway and Citracado Parkway but both speeds remained above 60 mph. The delay for at these two stations showed an increase of 4.7 Veh-hrs at Via Rancho Parkway, and it increased slightly, by 0.1 Veh-hrs, at Citracado Parkway, which is the location of the I-15 Express Lanes intermediate access point where vehicles can enter and exit the facility. At Auto Parkway, speeds increased by 15 mph, and delay decreased by almost 21 Veh-hrs. No change in speed was seen at Valley Parkway, but delay increased by 8.1 Veh-hrs.

In the PM peak hour, speeds increased for Via Rancho Parkway, Citracado Parkway and Auto Parkway between YR 2010 and YR 2013 by a range of 9 mph to 30 mph. Traffic delay decreased for both Via Rancho Parkway and Citracado Parkway, with a decrease of 81.2 Veh-hrs and 245.5 Veh-hrs. Auto Parkway delay remained the same for both study years. Travel speeds at Valley Parkway decreased by 12 mph, and delay increased by 55.4 Veh-hrs.

In YR 2013, vehicles driving along northbound I-15 experience traffic delay at Via Rancho Parkway and Citracado Parkway, which increased by approximately 1 minute and 3 minutes, respectively, in the 8 am hour.

An existing intermediate access point (IAP) for the I-15 Express Lanes is located at Citracado Parkway, where HOV and FasTrak vehicles enter and exit the managed lanes facility. This IAP is the last access point in the northbound direction before the express lanes end at either the Hale direct access ramp (Hale DAR) or at the transition point with the general purpose lanes just north of the I-15/SR-78 Separation. Vehicles traveling on the express lanes and desiring to access Valley Parkway and the connector to SR-78 must use this IAP to exit the facility and merge across five general purpose lanes of northbound I-15. Exiting traffic from the I-15 Express Lanes creates an additional demand on the general purpose lanes during the peak hour periods as these vehicles compete for gaps in the lanes to reach the off-ramp at Valley Parkway and the connector for SR-78.

Southbound I-15

Table 10 compares the speed and delay for the peak hours for the five VDS along the southbound lanes of I-15 from Via Rancho Parkway to the eastbound SR-78 to southbound I-15 connector.

Table 10
I-15 Average Speed and Delay
Southbound Direction

Southbound I-15 Vehicle Detection Stations	AM Peak				PM Peak			
	YR 2010		Existing YR 2013		YR 2010		Existing YR 2013	
	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)	Speed (mph)	Delay (Veh-hrs)
Via Rancho Pkwy	60	8.2	56	17.8	68	1.1	68	0.2
Citracado Pkwy	50	32.7	52	32.0	67	0.5	67	0.3
Auto Pkwy/9th	40	63.4	51	47.8	67	1.8	68	0.2
Valley Pkwy	44	22.5	59	27.3	64	0.4	70	0.1

In the 8 am hour in YR 2013, speeds increased for Citracado Parkway, Auto Parkway and Valley Parkway increased by a range of 2 mph to 15 mph. At Via Rancho Parkway, the speed dropped 4 mph. In the 5 pm hour, speeds stayed relatively the same for Via Rancho Parkway, Citracado Parkway and Auto Parkway and increased by 6 mph at Valley Parkway.

Traffic delay decreased in the southbound direction for all locations and peak hour periods. Delay at Citracado Parkway was reduced by approximately 32 Veh-hrs for both peak hours. Auto Parkway showed the greatest decrease in delay with 62 Veh-hrs for the 8 am hour and 48

Veh-hrs for the 5 pm hour. For Valley Parkway, delay was reduced by 22 Veh-hrs and 27 Veh-hrs. The average delay experienced by each driver decreased within a range of 10 seconds to 40 seconds.

Additional Traffic Related Topics

Roadside Safety

Those portions of the managed lanes roadway that are at grade within the existing roadways will typically have a 4- foot wide painted buffer, except at the proposed Intermediate Access Points (IAPs) to separate the managed lane facility from the general purpose lanes. The structure portion of the project has bridge guard rails as safety features.

A sign plan will be provided by the traffic analysis group and consist primarily of directional and regulatory panels based on those used for recent HOV ramps.

Concrete barriers, both temporary and permanent, will be required for this project. The exposed ends of the barriers will be protected by pre-approved mechanical crash cushion systems, arrays of sand-filled plastic drums, and/or water-filled modules, where needed and as recommended by Traffic Operations during the subsequent phases of this project.

Accident Data

This project is classified as a Capital Improvement project; therefore, Table B collision data is not required.

Traffic Management Systems

Table 11 contain the ITS elements that are proposed within this project's limits along SR-78 and I-15:

Table 11
I-15 Existing and Proposed TMS Elements

Route	Direction	Approx. Postmile		Location Description	Type	Comment
15	SB	31.30	Proposed	I-15 SB from SR-78 EB Connector	RM Loop Sensor	Proposed RM station
15	NB	31.40	Existing	I-15 NB south of SR-78	VDS Loop Sensor	Modify existing VDS (Dual Drop) station. Temporary detection may be needed during construction.
15	SB	31.40	Existing	I-15 SB south of SR-78	VDS Loop Sensor	
15	SB	31.40	Existing	I-15 SB from SR-78 EB Connector	VDS Loop Sensor	
15	NB	31.40	Existing	SR-78 from I-15 NB Connector	VDS Loop Sensor	
15	NB	30.91	Existing	I15 NB HOV south of SR-78	VDS Loop Sensor	Modify existing VDS (Rev 8) station
15	SB	30.92	Existing	I-15 SB HOV south of SR-78	VDS Loop Sensor	
15	NB	30.93	Existing	I-15 NB HOV off south of SR-78	VDS Loop Sensor	
15	NB	30.72	Existing	Valley Parkway to I-15 NB	RM Loop Sensor	No impact anticipated to existing RM station
15	NB	30.72	Existing	I-15 NB HOV at Valley Parkway	VDS Loop Sensor	No impact anticipated to existing VDS station

RM=Ramp Meter; VDS = Vehicle Detection Station

Table 12
SR-78 Existing and Proposed TMS Elements

Route	Direction	Approx Postmile		Location Description	Type	Comment
78	WB	12.81	Existing	Twin Oaks Valley SB to SR-78 WB	RM Loop Sensor	No impact anticipated to existing RM station
78	WB	12.88	Existing	Twin Oaks Valley NB to SR-78 WB	RM Loop Sensor	
78	EB	13.02	Existing	Twin Oaks Valley to SR-78 EB	RM Loop Sensor	No impact anticipated to existing RM station
78	WB	13.06	Proposed	SR-78 WB east of Twin Oaks Valley	VDS Loop Sensor	New VDS station
78	EB	13.61	Proposed	SR-78 EB east of Twin Oaks Valley	VDS Loop Sensor	
78	EB	14.05	Proposed	Barham/Woodland to SR-78 EB	RM Loop Sensor	New RM station
78	WB	14.14	Existing	Barham/Woodland to SR-78 WB	RM Loop Sensor	Modify existing RM station. Provide temporary detection.
78	WB	14.82	Existing	SR-78 WB west of Nordahl	VDS Loop Sensor	Keep RM station operational until relocated. Convert RM to VDS station.
78	EB	14.86	Existing	Barham/Woodland to SR-78 EB	RM Loop Sensor	
78	WB	15.37	Existing	Nordahl to SR-78 WB	RM Loop Sensor	Modify existing RM station. Provide temporary detection.
78	EB	15.60	Existing	Nordahl to SR-78 EB	RM Loop Sensor	Modify existing RM station. Provide temporary detection.
78	WB	15.92	Existing	SR-78 WB east of Nordahl	VDS Loop Sensor	Modify existing VDS station
78	EB	15.92	Existing	SR-78 EB east of Nordahl	VDS Loop Sensor	
78	WB	16.27	Existing	SR-78 WB west of I-15	VDS Loop Sensor	Convert to RM station. Not enough storage on the connector ramps.
78	EB	16.27	Existing	SR-78 EB west of I-15	VDS Loop Sensor	
78	EB	16.27	Existing	I-15 Connector from SR-78 EB	VDS Loop Sensor	
78	WB	16.27	Proposed	SR-78 WB Connector from I-15 NB	VDS Loop Sensor	New VDS station.
78	WB	16.27	Proposed	SR-78 WB Connector from I-15 SB	VDS Loop Sensor	New VDS Station

Table 12 (Continued)
SR-78 Existing and Proposed TMS Elements

Route	Direction	Approx Postmile		Location Description	Type	Comment
78	EB	12.90	Existing	Twin Oaks Valley EB exit ramp	Field Master	Modify existing traffic signal
78	EB	12.90	Existing	Twin Oaks Valley EB exit ramp	Video Detection	Modify existing traffic signal
78	WB	12.92	Existing	Twin Oaks Valley WB exit ramp	Video Detection	Modify existing traffic signal
78	WB	14.20	Proposed	Woodland Pkwy WB exit ramp	Video Detection	Proposed traffic signal
78	EB	13.98	Existing	Barham Dr EB exit ramp	Field Master	Modify existing traffic signal
78	EB	13.98	Existing	Barham Dr EB exit ramp	Video Detection	Modify existing traffic signal
78	WB	15.49	Existing	Nordahl WB exit ramp	Field Master	No impact anticipated
78	WB	15.49	Existing	Nordahl WB exit ramp	Video Detection	No impact anticipated
78	EB	15.49	Existing	Nordahl EB exit ramp	Video Detection	No impact anticipated
78	--	12.6-16.7	Proposed	Within SR-78 project limits	Fiber Optic	

RM=Ramp Meter; VDS = Vehicle Detection Station

This project will also require sign bridges to install both FasTrak transponder antennas and changeable message signs (CMS). There are three proposed locations, which are along northbound I-15 near Valley Parkway UC, along southbound I-15 just north of the Hale Drive DAR, and along eastbound SR78 at the Twin Oaks Valley Road OC. At the Valley Parkway location, there is a possibility that the required transponder antennas and CMS could be combined with an existing I-15 HOV sign system but readability could be impacted. The project's estimate includes the cost for the sign bridges.

Existing signals at ramp intersections and existing ramp meters will be relocated as needed to accommodate the proposed SR-78 widening and ramp realignments, and new signals will be installed at both of the Woodland Parkway ramp intersections. Lighting along the SR-78 roadway in both directions has also been proposed.

The equipment at these locations, along with the items in Tables 11 and 12, have been incorporated within the Traffic Electrical section of the 11-page Engineer's Estimate (Exhibit 7).

5. DEFICIENCIES

During peak hours, vehicles traveling in both directions of I-15 and eastbound on SR-78 as well as managed lane traffic on I-15 Express Lanes experience congestion between Citracado Parkway and the I-15/SR-78 Separation due to a lack of connectivity for managed lane traffic using the express lanes.

The two northbound I-15 Express Lanes currently end at the Hale Avenue Direct Access Ramp (DAR) and the Sante Fe Avenue Overhead (OH), respectively. Traveling in a northerly direction, the two existing express lanes diverge 1,500 feet south of the Hale Avenue DAR, with one lane descending towards Hale Avenue while the other lane continues north until it is transitioned to a general purpose lane. Managed lane traffic, including HOVs and transit vehicles, that are traveling north on the express lanes and wanting to continue to SR-78 must exit the facility at the Citracado Parkway Intermediate Access Point (IAP), weave through four lanes of traffic on the I-15 general purpose lanes, within a 2.5-mile distance, before reaching the existing northbound I-15 to SR-78 connector, which operates at full capacity during peak hour periods. This weaving maneuver to exit the I-15 Express Lanes to reach the SR-78 connector increases the total volume of traffic on the I-15 general purpose lanes as well as on the northbound I-15 to SR-78 connector.

In the southbound direction, the I-15 Express Lanes begin south of the Santa Fe Avenue OH, with a single lane that carries managed lane traffic traveling southbound on I-15 from locations north of the I-15/SR-78 Separation. A second express lane starts at the Hale Avenue DAR, ascends to the level of the I-15 roadway and then starts to run parallel to the first express lane approximately 1,500 feet south of the DAR. Along eastbound SR-78, HOV and transit vehicles must use the existing two-lane southbound I-15 connector, which operates at full capacity during peak hours, and then immediately weave through four lanes of traffic on the I-15 general purpose lanes to the access point for the express lane just south of the I-15/SR-78 Separation. This maneuver must occur within 0.7 miles before this access point ends. If eastbound SR-78 managed lane traffic is unable to complete the weaving maneuver to enter this access point, the next opportunity to enter the I-15 Express Lanes is at the existing Citracado Parkway IAP, which is located approximately 2.8-miles downstream of the Hale Avenue DAR. This maneuver also competes with southbound I-15 traffic that must weave within the entering connector traffic to reach the Valley Parkway off-ramp.

Segments of SR-78 experience high levels of congestion during the peak hour periods due to insufficient capacity on the general purpose lanes and no HOV or FasTrak connectivity. In the westbound SR-78 direction, the segment between Twin Oaks Valley Road and Nordahl Road currently operates at full capacity during the peak hour periods. Three existing bottlenecks occur

within this segment: one at the Woodland Parkway off-ramp where vehicles back up onto the main lanes, one at Nordahl Road on-ramp where an existing auxiliary lane ends before the on-ramp, and between the Nordahl Road off-ramp and the I-15 connectors.

Along the eastbound direction, between Twin Oaks Valley Road and the Barham Drive/Woodland Parkway interchange, traffic volumes will be at capacity by year 2020. A bottleneck is created at the Twin Oaks Valley road on-ramp where entering traffic must merge into SR-78 main lanes before the auxiliary lane ends, and another bottleneck occurs between the Barham Drive on-ramp and the Nordahl Road off-ramp due to a short weaving distance. In addition, due to its short storage length and single lane ramp entrance, this same on-ramp, which has one HOV lane and one general purpose lane, creates a queue onto Barham Drive during peak hours.

According to a trip analysis for YR 2040, out of approximately the 16,392 vehicles on northbound I-15 that are projected to utilize the proposed managed lane connector, approximately 49% of this traffic is destined for the off-ramps at one of the five interchanges from Nordahl Road to Las Posas Road. This segment represents only 5 miles out of the 16.5 miles of the SR-78 roadway between Interstate 5 (I-5) and I-15. The remainder of this traffic would continue to destinations west of Las Posas Road and towards I-5. Approximately 5,067 vehicles will exit SR-78 at one of three off-ramps: Nordahl Road, Barham Drive/Woodland Parkway, or Twin Oaks Valley Road.

Since there are limited arterial networks along SR-78, local access in and around the Woodland Parkway/Barham Drive interchange is constricted due to the existing two-lane Woodland Parkway undercrossing structure. Local traffic heading to areas north or south of SR-78 must utilize the existing two lane Woodland Parkway roadway or travel one to two miles east or west to utilize the bridge structures at Twin Oaks Valley Road or Nordahl Road.

6. CORRIDOR AND SYSTEM COORDINATION

The Caltrans Planning Division publishes a Transportation Concept Summary (TCS), which provides critical system planning to internal and external partners, for routes in San Diego and Imperial Counties. Each of the TCS for I-15 and SR-78 recommend the improvements proposed by this PSR/PDS and are justified in the TCS based on the corridor traffic analysis. This analysis shows that the proposed improvements would reduce delay and improve travel time.

This project is listed in SANDAG's 2050 RTP, the I-15 Corridor System Management Plan (CSMP) of 2009, and is listed in the TransNet Ordinance. This project will interconnect the I-15

Express Lanes with the future managed lanes proposed on both SR 78 and I-5, providing HOV connectivity between the two interstate systems. The proposed I-15/SR-78 managed lane connector is a critical element within San Diego's HOV system.

This project is listed as the top priority among HOV Connector projects in the San Diego Association of Governments (SANDAG) 2050 Regional Transportation Plan (2050 RTP), with an estimated cost of $105 million, and is currently scheduled for construction by the year 2020.

The TransNet Extension Ordinance and Expenditure Plan listed the proposed managed lane connector under Interstate 15 improvements and provided a capital cost estimate of $200 million, which included $3 million for mitigation costs.

Transit Considerations

The NCTD BREEZE bus system currently has two routes that service this portion of the SR-78 corridor. Route 305 is a bus route that connects the Vista Transit Center with the Escondido Transit Center. It roughly parallels SR-78 along Santa Fe Avenue and Mission Road and also serves Palomar College and the San Marcos Civic Center.

Route 353 is a bus route that connects the Nordahl Marketplace, just north of SR-78, with the Escondido Transit Center. This short route follows Nordahl Road to serve Palomar Medical Center and the Home Depot Shopping Center. This route continues on West Valley Parkway before terminating at the Escondido Transit Center.

Two Bus Rapid Transit (BRT) routes run along I-15 within the project limits. Rapid 235 is an all day, every day, limited-stop service, with 15 minute frequency, that runs between the Escondido Transit Center, located east of the Valley Parkway interchange, to Downtown San Diego using I-15 Express Lanes and the Direct Access Ramps (DARs). This BRT service has intermediate stops at Del Lago, Rancho Bernado, Sabre Springs/Penasquitos and Mira Mesa transit centers. Also running along I-15, Rapid Express 280 is a weekday, peak hour only service that makes frequent trips south in the morning and north in the late afternoons and evenings. The service stops at the Escondido Transit Center, Del Lago Transit Center, and Downtown San Diego.

BRT Route 430, which would operate between Oceanside and Escondido during peak hours, is proposed under SANDAG's 2050 RTP Unconstrained Revenue scenario. The estimated cost under this revenue scenario is listed as $234 million. The improvements that would be constructed with this project would not preclude BRT Route 430. The proposed managed lane connector, once built, would provide the connectivity between the BRT on the I-15 Express Lanes and the proposed BRT Route 430.

Both routes run at approximately 30 minute intervals and interconnect with the SPRINTER. The SPRINTER, which is a heavy rail passenger line, runs somewhat parallel to SR-78, between I-5 and I-15. The 2050 RTP proposes to double track the existing rail line and to provide express service every 10 minutes by the year 2030.

Bicycle Facilities

The needs of non-motorized transportation are an essential part of all highway projects (HDM Topic 1001).

- Bicycles and pedestrians must be accommodated on state transportation projects.
- Bicycles and pedestrians are important and legitimate transportation modes on the state transportation system.
- Bicycles and pedestrians are allowed generally anywhere on the state transportation system except freeways.

Caltrans and local agencies work in cooperation to construct Class I (bike path) and Class II (bike lane) facilities to better serve the bicycling public.

Within the project area and accessed from a network of local Class III bike routes, the Inland Rail Trail, which is a Class I bikeway, generally follows the SPRINTER rail alignment. The Inland Rail Trail is part of a proposed 21-mile Class I facility that is located within the cities of Oceanside, Vista, San Marcos, and Escondido, as well as within a portion of the unincorporated County of San Diego. A typical cross section of this trail consists of two 5-foot-wide paved bicycle lanes and two 2-foot wide unpaved shoulders, for a total width of 14 feet.

The eastern most portion of the bikeway has been constructed by the cities of Escondido and San Marcos and extends from the Escondido SPRINTER Rail Station in the City of Escondido to the intersection of West Mission Road and North Pacific Street in the City of San Marcos. The Inland Rail Trail is located north of SR-78 between Las Posas Road and Mission Road, crosses under SR-78 at the Mission Road Overhead structure, continues nearly parallel along the south side of SR-78, and crosses under I-15 at Washington Avenue. Table 13 lists the bicycle facility types within the project limits.

Table 13
Bicycle Facilities and Types

Interchange/Over/Undercrossing	Bicycle Facility Type	Sidewalks
Twin Oaks Valley Rd	Class II	Yes/ Both Sides of the Street
Barham Dr	Class II	Yes/ South Side of the Street
Rancheros Dr	Class II	Yes/ North Side of the Street
Woodland Parkway	Class II	Yes/ Both Sides of the Street
Mission Rd/Inland Rail Trail	Class II/Class I	Yes/ Both Sides of the Street
Nordahl Rd	Class II	Yes/ Both Sides of the Street

The Inland Rail Trail is considered a priority project by SANDAG and an important element of the San Diego Regional Bicycle Plan and is expected to be completed by 2019. Completion of this trail and other similar Class I facilities will help establish an interconnected regional bike network throughout the region.

Every effort will be made during design and construction of this project to preserve the accessibility of bicycles and pedestrians on sidewalks and bicycle facilities within the project area. Enhancements and improvements relevant to bicycling and pedestrian modes will be handled during a later phase of project development.

7. ALTERNATIVES

The two build alternatives studied for this project are each based on the Managed Lane system management practice.

According to the 2012 California Manual of Uniform Traffic Control Devices, the definition of a managed lane is "…a highway lane or set of lanes, or highway facility, for which variable operational strategies such as direction of travel, pricing, and/or vehicle type or occupancy requirements are implemented and managed in real-time in response to changing conditions. Managed lanes are typically buffer- or barrier-separated lanes parallel to the general purpose lanes of a highway in which access is restricted to designated locations."

The managed lane facility incorporates a high degree of operational flexibility so that over time operations can be actively managed to respond to growth and changing needs. The operation and demand on the facility is managed using a combination of tools and techniques in order to continuously achieve an optimal condition, such as free flow speeds.

In California, the concept of a managed lane was first put into practice in 1962. Managed lanes, as defined in the 2011 Traffic Operations Policy Directive (TOPD) 11-02, are lanes that are proactively managed in response to changing conditions and are increasingly used nationwide to deal with congestion and limited resources. The strategic goals of a managed lane project are:

- Decrease congestion duration and reduce congested locations
- Increase person-throughput on a corridor by increasing vehicle occupancy, whether through carpooling, vanpooling, or transit
- Provide time savings that will provide incentives for HOV and FasTrak users to utilize the facility.
- Decrease per-person air quality impacts
- Increase predictability of travel by reducing variations in delay
- For Express Lanes, generate revenue for corridor transportation improvements that include transit and closing gaps in the managed lane network.

The term “managed lane,” in this document, refers to two lane management strategies listed in TOPD 11-02: high occupancy vehicles (HOV) and express lanes, which refers to either high occupancy/toll (HOT) lanes or express toll lanes.

The two lane management strategies studied as build alternatives for this proposed I-15/SR-78 connector project are HOV lanes and HOT lanes, which will, from this point on, be referred to as “Express Lanes” in this report to avoid potential confusion between the HOV and HOT acronyms. A No Build alternative was also considered as a part of this project. A summary of the three alternatives is shown in Table 14.

Table 14
Alternative Comparison Summary

	Alternative 1 HOV Only	Alternative 2 Express Lanes	No Build
Pros:			
Provides HOV Only connectivity between the existing I-15 Express Lanes facility and the proposed future managed lanes facilities on I-5 and SR-78	✓	✓	
Encourages ridesharing	✓	✓	
Increases person-throughput on a facility	✓	✓	
Lessen demand on the general purpose lanes	✓	✓	
Mass transit use is promoted	✓	✓	
HOVs are not required to pay a fee to use the facility	✓	✓	
FasTrak users can access the system by electing to pay a fee.		✓	
Available unused capacity is utilized by FasTrak users		✓	
Ability to utilize other lane management strategies by using pricing equipment installed during construction.		✓	
Generates revenue through a pricing scheme.		✓	
Cons:			
Excess available capacity is underutilized.	✓		
FasTrak vehicles traveling NB on I-15 Express Lanes must exit the facility to travel to WB SR-78	✓		
As traffic demand changes, future use of other managed lane strategies, such as Express Lanes or Express Tolling, would require installation of equipment and signage.	✓		

For the two build alternatives, the proposed roadway and structure geometry is identical, which establishes this project's preliminary footprint for future engineering and environmental studies that will occur in the next project phase. The geometrics of the proposed project footprint will be discussed in detail later in this section.

Alternative Summaries

Alternative 1: High Occupancy Vehicle (HOV) Lanes

For Alternative 1, vehicle occupancy is the lane management strategy utilized to provide connectivity for managed lane traffic between the I-15 Express Lanes to the future proposed managed lanes facility along SR-78 between Interstate 5 (I-5) and I-15. Sometimes referred to as a carpool lane, HOV lanes are a special lane reserved for the use of carpools, vanpools and buses, which allow these higher occupancy vehicles to bypass lower occupancy traffic in the adjacent, unrestricted "general purpose" lanes.

HOV traffic, with a minimum occupancy of two or more people, would be allowed to utilize the proposed I-15/SR-78 managed lane connector structure to travel between the I-15 Express lanes and the future SR-78 managed lanes, without having to exit the managed lanes and access the existing connectors, which are operating near congestion levels during peak hours. Mass transit, motorcycles and other vehicles approved by California state law are also granted access to the proposed connector.

All other vehicles must use the general purpose lanes and existing connectors of the I-15/SR-78 Separation. Vehicles not meeting the occupancy requirements that are traveling northbound on the I-15 Express Lanes would need to exit these lanes at the Citracado Parkway IAP to rejoin the general purpose traffic using the existing NB I-15 to WB SR-78 connector. HOV traffic from eastbound SR-78 wanting to use the I-15 Express Lanes must weave through the general purpose lanes to enter at the Citracado Parkway IAP.

This alternative would require a new two lane connector structure, one lane for each freeway to freeway movement, to be constructed between I-15 and SR-78. The proposed structure would be built just north of the Hale Direct Access Ramp and would connect to SR-78 just east of the SR-78/Nordahl Road interchange and west of the I-15/SR-78 Separation. HOV lanes would also be constructed along SR-78 from just east of the Twin Oaks Valley Road interchange to the start of the proposed connector. Additional signage and striping would be required along both I-15 and SR-78.

Alternative 2: Express Lanes

For Alternative 2, vehicle occupancy and value (congestion) pricing are the lane management strategies utilized to provide connectivity for managed lane traffic between the I-15 Express Lanes to the future proposed managed lanes along SR-78 between I-5 and I-15. Value pricing is a management tool where the cost to use a managed lane facility is varied during certain time periods in order to managed the demand on the facility. Examples of value pricing include peak-period surcharges or off-peak discounts.

In addition to HOV traffic, this express lanes alternative would allow vehicles with a FasTrak transponder to utilize the proposed I-15/SR-78 managed lane connector structure to travel between the I-15 Express Lanes and the future SR-78 managed lanes. These vehicles would pay a fee that is adjusted based on the demand on the managed lanes to keep these lanes free-flowing or at a predetermined acceptable level of service (LOS).

Northbound I-15 Express Lanes traffic traveling to westbound SR-78 would not have to exit the managed lanes facility and will have continuous path to the proposed future SR-78 managed

lanes facility, which is being studied as a separate project. Eastbound SR-78 express lane traffic will also have a continuous route to the I-15 Express Lanes facility. Mass transit, motorcycles and other vehicles approved by California state law are also granted access to the proposed connector.

By allowing vehicles equipped with FasTrak transponders to pay a fee to access the managed lane facility, any unused available capacity within the system would be fully utilized. When HOV demand is low, prices are adjusted to encourage these vehicles to use the system. When HOV demand is high, prices are readjusted to maintain free-flow conditions and/or other predetermined operational goals by discouraging FasTrak vehicles from entering the facility during these high capacity periods.

This alternative would require a new two lane connector structure, one lane for each freeway to freeway movement, to be constructed between I-15 and SR-78. The proposed structure would be built just north of the Hale Direct Access Ramp and would connect to SR-78 just east of the SR-78/Nordahl Road interchange and west of the I-15/SR-78 Separation. Depending on the construction phasing selected during this project's next phases, which is discussed later in this section, express lanes would also be constructed along SR-78 up to a distance of 1 to 3 miles. Additional signage and buffer striping would be required along both I-15 and SR-78. New managed lane pricing equipment would be needed along the proposed express lanes connector and along the proposed SR-78 managed lanes.

No Build Alternative

A No Build alternative was considered for this project. This alternative would maintain the existing geometry, lane configurations and system management operation for both I-15 and SR-78 freeways. Current and future traffic deficiencies would not be addressed in this alternative and would not fulfill the need and purpose of this project.

This alternative would not meet the goals of SANDAG's 2050 Regional Transportation Plan (RTP) or of the TransNet Extension and Ordinance. Therefore, regional connectivity between the current managed lanes facility along I-15 and future managed lanes facilities proposed for I-5 and SR-78 would not be provided.

Additional Managed Lane Operational Strategy Topics

Existing 15/78 Connector Capacity

SANDAG anticipates that by YR 2020 a total of 18% of vehicular traffic will be HOVs and vehicles using FasTrak transponders that would be able to use an express lane facility.

In April 2013, manual vehicular occupancy counts were collected during the PM peak period on the I-15 Express Lanes just north of Hale Avenue. Analysis of the data indicated that approximately 60% of the vehicles using the express lanes consisted of two or more people. The remaining 40% of the vehicles counted were single occupancy users with FasTrak transponders.

For the purpose of this preliminary analysis, the 18%, provided by SANDAG, was used as the total amount of PM peak hour traffic that would use the new connector. From this amount, the forecasted distribution of the new connector traffic between HOVs and those with FasTrak Transponders was estimated by using the percentages found from the manual field counts, which was set at 60% for HOVs and 40% for FasTrak users. It was assumed for this analysis that all calculated future managed lanes volumes originating on the I-15 Express Lanes would continue onto westbound SR-78 since PeMS data was not available to determine the percentage of traffic entering or exiting the express lane facility at the Citracado Parkway IAP.

Since the existing connectors had v/c ratios of 0.90 or greater in the existing and No Build PM peak hours, as shown in Tables 7 and 8, this peak period was used to approximate the future demand for both the northbound I-15 to westbound SR-78 (NB15/WB78) and the eastbound SR-78 to southbound I-15 (EB78/SB15) connectors.

Northbound I-15 to Westbound SR-78

At the I-15/SR-78 Separation, the existing northbound I-15 connector to SR-78 is two lanes wide at its connection with I-15. Eastbound SR-78 traffic uses a single lane connector that branches off from the main SR-78 connector, and the westbound SR-78 traffic remains on the two-lane connector structure, which curves left over I-15. Vehicles on the I-15 Express Lanes that want to transition to SR-78 must exit the facility at the Citracado Parkway intermediate access point and weave their way through the general purpose lanes to reach the auxiliary lanes leading into the existing I-15/SR-78 connector.

In YR 2013, the existing connector has a demand of 3660 vehicles/hour (vph) during the PM peak period. Using a single lane capacity of 2,000 vph per lane, the two lane connector would have a total capacity of 4,000 vph. The existing connector has a volume-to-capacity (v/c) ratio of 0.92, which indicates it is operating below capacity during the PM peak period.

Using the YR 2020 PM peak period volumes from Exhibit 5, Table 15 compares the capacity for the existing NB15/WB78 connector for each of the alternatives: Alternative 1-HOV only,

Alternative 2- Express Lanes, and No Build. A linear growth rate of 1% per year was used to estimate the future year that the existing NB15/WB78 connector would reach its full capacity of 4,000 vph. The estimated total number of managed lane users in YR 2020 is approximately 750 vehicles

Using Alternative 1-HOV Only, approximately 450 HOVs, whose trips originated on the I-15 Express Lanes, could utilize the proposed connector instead of exiting the express lane facility at the Citracado Parkway IAP to access SR-78. This would decrease the volume of vehicles using the existing NB15/WB78 connector from 3,960 vph to 3,510 vph and would allow the service life of the connector to be extended for an additional 15 years beyond the build YR 2020. The v/c ratio for this alternative would be 0.88, which means the connector would be operate under capacity in YR 2020.

Using Alternative 2-Express Lanes, the proposed connector would remove approximately 750 vehicles, representing 450 HOVs and 300 solo drivers using FasTrak, from the demand on the existing general purpose connector. The existing NB15/WB78 connector would have a reduction in volume from 3,960 vph to 3,210 vph, which would extend the service life of the connector for an additional 23 years to year 2043. With a v/c ratio 0.80, the connector would operate at a slightly lower capacity level than Alternative 2 in YR 2020.

In the No Build condition for YR 2020, the two existing connector lanes for the NB15/WB78 movement will be unable to handle the demand of 3,960 vph that is forecasted for YR 2020. Using a linear growth rate of 1%, the existing connector would operate at full capacity in the year 2023. For the No Build condition, the v/c ratio would be 0.99 in YR 2020, which indicates that the existing connector would operate at full capacity during the PM peak hour.

Table 15
Future Capacity Comparison
Existing NB I-15 to WB SR-78 Connector
YR 2020 PM Peak Hour

Managed Lane Connector Type	YR 2020 Volumes (vph)				Year Existing NB15/WB78 Connector Reaches Capacity
	Total NB15/WB78 Traffic	HOV	FasTrak	Total Using Existing NB15/WB78 Connector[(1)]	
HOV Only (Alt 1)	3,960	450	-	3,510	Yr 2035
Express Lanes (Alt 2)	3,960	450	300	3,210	Yr 2043
No Build (Alt 3)	3,960	-	-	3,960	Yr 2023

(1) Based on 18% of total connector traffic as anticipated by SANDAG

Eastbound SR-78 to Southbound I-15

At the I-15/SR-78 Separation, the existing eastbound SR-78 to southbound I-15 connector is a two-lane at-grade facility until it ascends to travel over the existing Mission Avenue Undercrossing to join the I-15 general purpose lanes. HOV traffic that wants to use the I-15 Express Lanes must weave through the general purpose lanes to enter the express lane facility at Citracado Parkway access point.

In the Existing YR 2013, the existing EB78/SB15 connector has a demand of 3860 vph during the PM peak period. Using a capacity of 4,000 vph, this existing connector has a volume-to-capacity (v/c) ratio of 0.97, which indicates it is currently nearing its capacity during the PM peak period.

Table 16 compares the capacity of the existing EB78/SB15 connector for Alternative 1-HOV only, Alternative 2-Express Lanes, and No Build alternative in the PM peak period using future YR 2020 volumes. A linear growth rate of 1% per year was used to estimate the future year that the existing EB78/SB15 connector would reach its capacity of 4,000 vph. The estimated total number of managed lane users in YR 2020 is approximately 785 vehicles

Using Alternative 1-HOV Only, the proposed connector would remove 470 vehicles from the existing general purpose connector. This would decrease the volume of vehicles using the existing EB78/SB15 connector from 4,180 vph to 3,710 vph, which would extend the service life of the connector an additional 9 years to YR 2029. The v/c ratio for this alternative would be 0.92, which indicates that the connector would operate near capacity levels in the PM peak period in YR 2020.

Using Alternative 2-Express Lanes, the proposed connector would remove approximately 785 vehicles, representing 470 HOVs and 315 solo drivers using FasTrak, from the demand on the existing general purpose connector. The existing EB78/SB15 connector would have a reduction in volume from 4,180 vph to 3,395 vph, which would extend the service life of the connector for an additional 18 years to YR 2038. For YR 2020, the v/c ratio would be 0.85, indicating that the connector would have sufficient capacity in the PM peak period.

In the No Build condition for YR 2020, the two existing connector lanes for the EB78/SB15 movement will be unable to handle the demand of 4,180 vph that is forecasted for YR 2020. Using a linear growth rate of 1% to approximate the number of years before YR 2020 that the existing connector would reach capacity, it was approximated that full capacity would be reached around 2015. The v/c ratio in YR 2020 for the No Build scenario would be 1.05, which means that the connector would operate at full capacity.

Table 16
Future Capacity Comparison
Existing EB SR-78 to SB I-15 Connector
YR 2020 PM Peak Hour

Managed Lane Connector Type	YR 2020 Volumes (vph)				Year Existing EB78/SB15 Connector Reaches Capacity
	Total EB78/SB15 Traffic	HOV	FasTrak	Total Using Existing EB78/SB15 Connector(1)	
HOV Only (Alt 1)	4,180	470	-	3,710	Yr 2029
Express Lanes (Alt 2)	4,180	470	315	3,395	Yr 2038
No Build (Alt 3)	4,180	-	-	4,180	Yr 2015

(1) Based on 18% of total connector traffic as anticipated by SANDAG

Intermediate Access Points (IAP)

Intermediate Access Points (IAPs) are ingress/egress locations which feed or remove vehicles from a managed lane facility.

An October 21, 2013 Technical Memorandum entitled, "San Diego Regional HOV/Managed Lanes Systems Planning and Implementation Guide: Recommendation for the I-15/SR-78 Connector" (Exhibit 16), addressed the placement of IAPs along the SR 78 corridor. Within this memorandum, the preliminary design of this project's IAPs was determined by using the guidelines established in the *Traffic Operations Policy Directive (TOPD) 11-02***.** The main considerations for locating access openings is existing interchange spacing, existing and

expected locations of mainline operational bottlenecks, and geometric constraints that produce recurrent congestion and queuing along the general purpose lanes.

According to TOPD 11-02, "access openings should be located and designed such that they will perform at a Level of Service (LOS) 'C' or 'D', as per HDM Index 504.7. They should not produce adverse impacts to managed lane and general purpose lane performance nor should they be placed where recurrent general purpose congestion is expected."

TOPD 11-02 also provides key criteria for locating openings for buffer-separated managed lanes, as described in the Technical Memorandum and restated below.

- The start of an IAP (start dashed striping) should be located at a sufficient distance from the immediate upstream on-ramp.
- The recommended distance is equal to 800 feet times the number of lane changes that a driver from the upstream on-ramp needs to make to get into the HOV lane by the end of the IAP.
- A similar criterion applies to the end of an IAP, where the end of the dashed striping should be located at a sufficient distance from the closest downstream off-ramp (800 feet per lane change, not counting the lane change out of the IAP).
- The standard length of an IAP is 2000 feet (dashed striping).

Along SR-78, four IAP locations have been identified for this project as shown in Table 17. The IAPs have been strategically located to receive and discharge vehicles from all the interchanges west of the I-15/SR 78 Separation with the exception of Nordahl Road. Traffic to and from the Nordahl Road interchange will not be served by the proposed managed lane connector due to its close proximity to the I-15/SR 78 Separation.

Table 17
IAPs Locations Along SR-78

Direction	From	Station	To	Station	IAP Length
WB SR 78	Nordahl Off	859+00	Nordahl On	839+00	2,000 ft
WB SR 78	Twin Oaks Off	730+00	Twin Oaks On Loop	710+00	2,000 ft
EB SR 78	Twin Oaks Off	705+00	Twin Oaks On	725+00	2,000 ft
EB SR 78	Nordahl Off	839+00	Nordahl On	859+00	2,000 ft

Along I-15 and within the project limits, an existing IAP is located at the Citracado Parkway interchange. This IAP is currently proposed to be left in place. Since this IAP is the first access point on the existing southbound I-15 Express Lanes, vehicles traveling from eastbound SR-78 to

southbound I-15 that are destined for Valley Parkway, 9th Avenue, and Citracado Parkway off-ramps would not be able to use the proposed managed lane connector. A second IAP location was proposed and studied within the October 21, 2013 Technical Memorandum, but it was not recommended due to insufficient distance between the IAP and Valley Parkway off-ramp.

Pricing

SANDAG is the regional authority for setting the pricing for managed lane projects in San Diego County. In 1993, Assembly Bill 713 added language to the California Streets and Highways Code allowing SANDAG to implement the I-15 Express Lanes, originally introduced as a demonstration project for value pricing and transit development. This bill authorized SANDAG to establish the fee to allow single occupancy vehicles to use high occupancy vehicle lanes during peak hours. In 2001, Senate Bill 313 amended the demonstration project to allow the I-15 Express Lanes to remain in place as a permanent facility and continued SANDAG's authority to set pricing for these lanes, which was amended in the California Streets and Highways Code 149.1. In addition, Code 149.1 authorizes SANDAG to conduct and operate additional value pricing demonstration projects, on a maximum of two corridors, and to set the fee for use of that facility by single occupancy vehicles.

SANDAG would be the lead agency to set pricing if SR-78 becomes the second of these two corridors to propose an Express Lanes facility. If this current legislation has been fulfilled, a new bill would have to be submitted to grant SANDAG the authority to add the SR-78 corridor, including this proposed connector project, as another value pricing project within the California Street and Highways Code.

<u>Pricing Rate</u>

Pricing for the express lane connector and express lanes proposed in Alternative 2 would be an additional cost to vehicles already traveling on the I-15 Express Lanes. According to the San Diego Regional HOV/Managed Lanes Systems Planning and Implementation Guide, dated October 21, 2013, the I-15 Express Lanes pricing scheme work as a linear system where charges to FasTrak drivers are based on the length of the segment traveled and vary by time of day.

Using the same linear technique to determine the pricing scheme for the proposed segment of SR-78 managed lanes would not be the best solution. Since at the highest cost of 40 cents per mile that is currently used on I-15, the effective cost to use the proposed I-15/SR-78 managed lane connector would only be 40 cents. The cost to use the planned managed lanes from east of the Twin Oaks Valley Road interchange to the start of the proposed connector would be approximately 0.90 to 0.95 cents in the westbound and eastbound directions, respectively.

Setting the cost at 40 cent per mile rate would encourage more FasTrak users to use the connector's available capacity, which would make sure that the facility is fully utilized, but it would eventually cause the connector to operate at over-capacity conditions, which would then create congestion and queues onto the I-15 Express Lanes and SR-78. A low price rate would also encourage drivers who are not typically I-15 Express Lane users to weave through the I-15 general purpose lanes to use the connector whenever the general purpose connectors to SR-78 are congested.

To discourage this behavior and to prevent operation of the proposed connector at over capacity levels, a higher rate per mile on SR-78 could be used for the connector. The issue with using a higher rate only for the connector is that it could result in higher total cost when the managed lanes on SR-78 are extended west towards Interstate 5.

Opening Day

A standard flat pricing rate approach could be applied on opening day and continued until the time the connectors' capacity is reached, which is currently set by SANDAG as 1,600 vph.

Dynamic pricing would then be implemented to control the LOS on the managed lane connectors. The connector pricing system will be separate from the I-15 Express Lane pricing. Consideration should be given to tying the connector's pricing system with the proposed HOV/MGD lanes on SR 78 from I-5 to Twin Oak Valley Road (EA 2T241K).

Electronic Toll Collection System and Signage

An electronic toll collection (ETC) system collects and processes toll payments as vehicles travel along the managed lanes without motorists needing to stop and make physical transactions that increase travel times. In California, FasTrak is the ETC system used in California.

An ETC has basic elements that include

- In-vehicle FasTrak transponders
- Transponder readers mounted on toll gantries over each managed lane
- Variable Toll Message Signs (VTMSs) to display dynamic toll rates
- Closed-circuit television (CCTV) for enforcement
- Loop detectors or other devices to obtain real-time traffic information to calculate the appropriate toll rate
- Telecommunications between the ETC and an administration office

- Central database with host computer system to manage accounts.

Toll collection gantries would be installed at the proposed managed lane connector entrances, IAPs, at the access points to/from the managed lanes along SR-78, and at the access point to the southbound I-15 Express Lanes, just north of the Hale Avenue DAR.

In addition to new VTMSs, connector price signage could be incorporated by modifying the existing Dynamic Message Signs along the northbound I-15 Express lanes, but this could lead to displaying more information than is safe for a driver to read and also could increase the confusion encountered by new or infrequent drivers to the corridor. A better option may be to place connector pricing information on separate signs after State Route 56 in the northbound direction, which is approximately 12 miles south of the proposed managed lane connector. Signage on EB SR-78 should be signed as a standard Express Lane Entrance.

Project Geometrics

This project would provide future connectivity between the proposed managed lane facility along SR-78, which will be studied through a separate project, and the I-15 Express Lanes. The construction of a new direct managed connector would alleviate traffic congestion on the existing connectors of the I-15/SR-78 Separation, which is currently operating at near capacity levels. Managed lane vehicles would remain in their dedicated lanes to travel between the two freeway facilities without having to exit and merge into the general purpose lanes to access the existing connectors. This project, along with the City of San Marcos's Woodland Parkway/Barham Road local road and bridge replacement project, will improve regional and local travel.

As mentioned earlier in this section, the project geometrics are identical regardless of the alternative chosen, and these project features will define the preliminary footprint used to commence future engineering and environmental studies for both build alternatives. This footprint meets and exceeds the requirements of SANDAG's 2050 RTP for YR 2020.

Project Features

The major project features of this project include the construction of a new two-lane wide direct connector structure between I-15 and SR-78, the widening of Mission Avenue Overhead (Mission OH) to the north, and the full replacement of the existing Woodland Parkway Undercrossing (Woodland UC). This project also includes widening of SR-78 to the outside to accommodate a single managed lane along the existing median, HOV or Express Lane, in each direction from Twin Oaks Valley Road and to just west of I-15.

Advance Planning Studies - Proposed Structures

This project has three structure components: new I-15/SR-78 direct connector, widening of Mission OH and full replacement of Woodland UC. A detailed description of each structure is as follows:

I-15/SR-78 Managed Lane Connector (NEW)

The proposed I-15/SR-78 managed lane direct connector structure, which would serve both directions of travel, would begin in the existing center median of I-15 at the Hale Avenue UC, just north of the Hale Avenue DAR, and would connect to the existing lanes of the I-15 Express Lanes. The structure would rise in elevation in a northerly direction before curving towards the west to span the Sprinter light rail facility running west to east under I-15, Mission Avenue, the I-15 southbound lanes, an existing mitigation site, and the eastbound SR-78 main lanes. The connector would touch down in the existing median area of SR-78, west of the I-15/SR-78 Separation and nearly parallel to the westbound on-ramp from I-15. As part of this project, managed lanes, one in each direction, would connect to the new connector at the SR-78 end.

This proposed cross section of this structure would accommodate two 12-foot lanes, standard 10-foot outside shoulders, and 5-foot inside shoulders. A Type 60 concrete barrier would separate the opposing directions of travel, and Type 736 bridge railing would be used on the outside shoulders. The nominal width of the structure is 59 feet, and its proposed length of 3,461feet.

The structure would be constructed with cast in drilled hole (CIDH) piles that will be used to support the foundation. Cast in Place/Prestressed (CIP/PS) concrete box girders would be used to support the bridge deck. Mechanically Stabilized Earth (MSE) walls would be used for structure transitions to I-15 and SR-78.

SANDAG's 2050 RTP does not included future plans to widen SR-78 to add additional general purpose lanes or managed lanes beyond the scope proposed in this project. The potential for future widening of the structure to four lanes would not be precluded. Where feasible, roadways features, including bridge column placement, will be designed to allow for future operational or geometric improvements.

The current cost for this direct connector is estimated at **$38.1 million**. (Exhibits 7 and 8)

Mission Road Overhead: Bridge No. 57-0135 (Existing)

This existing overhead (OH) structure was originally built in 1962 as a Reinforced Concrete (RC) box girder bridge. It was first widened in 1990, and then again in 2013 on its southern edge (eastbound direction). It consists of four spans and uses RC open end seated abutments. The existing bridge length is 354 ft, and it has a current total width of 143 ft.

This project proposes widening the westbound direction of the structure by 30 feet to accommodate one managed lane and one general purpose lane. There are two alternatives proposed for this widening. In the first alternative, CIDH concrete shafts with isolation casing will be used to support a CIP/PS concrete box girder. A second alternative proposes the use of a precast/prestressed (PC/PS) 4 ft x 4 ft concrete box girder, which has the advantage of constructing a thinner box girder to support the deck. This would increase the bridge's vertical clearance over Mission Road by up to 6 inches.

Since the SPRINTER light rail train travels alongside Mission Road on its western roadway edge and will need to remain operational, railroad flagging will be required during construction. A detailed bridge review will be done in later phases of the project to determine if any additional work is required on the existing portions of this bridge structure.

The widening of this existing structure is necessary for the construction of the proposed managed lanes from Twin Oaks Valley Road to the 15/78 Separation, specifically in the westbound direction. If the managed lanes are only constructed to end just west of Nordahl Road interchange, there will not be enough width to provide adequate work areas and to maintain traffic during future construction.

The current cost of this structure widening is estimated at **$3.6 million** (Exhibits 7 and 8).

Woodland Parkway Undercrossing-Bridge No. 57-0389 (Replacement)

This undercrossing (UC) structure was originally built in 1962 as a Reinforced Concrete (RC) slab with closed end cellular abutments on columns and RC pier walls on spread footings. It was widened in 1990. At that time, the median abutment was built on concrete piles. Two existing lanes, one lane in each direction, carry traffic from Woodland Parkway to the north of SR-78 and to Barham Drive to the south of SR-78. The current span length of 43 ft is insufficient to accommodate future traffic volumes on SR-78 and Woodland Parkway.

The existing structure is to be demolished and replaced with an undercrossing structure that is varies between 174 feet wide and 174 feet long. The new structure will be built with

precast/prestressed (PC/PS) rectangular girders and will be able to accommodate eight general purpose lanes and two managed lanes on SR-78. Woodland Parkway would be widened to four lanes, two lanes in each direction, with left turn lanes and a bicycle lane under the UC structure. The westbound ramps would also be realigned to reconnect the ramps to SR-78.

During construction, the proposed demolition of the existing structure and the new bridge replacement is to be phased over several construction stages to maintain traffic flow on SR-78. The phasing is needed to avoid impacting the Sprinter's light rail structure during construction, which is located just east of the Woodland Parkway UC and which crosses over SR-78 in a northwesterly direction.

The current cost of this structure replacement is estimated at **$6.3 million**. (Exhibits 7 and 8)

Although the construction and structure cost is anticipated to be covered by the proposed City of San Marcos Barham Drive/Woodland Parkway project, the cost has been included in this project's estimate in the event that City's project encounters issues that would delay or postpone this bridge replacement. This structure's replacement is an essential part of constructing the proposed managed lanes from the 15/78 Separation to Twin Oaks Valley Road (Exhibit 2a).

Roadway Features

The proposed roadway improvements that must be constructed with each of the aforementioned structures include roadway widening towards the outside of the SR-78 facility, realignment of ramps, ramp relocation, and realignment of local streets within the proposed roadway prism.

These roadway improvements include the required construction activities, such as clearing and grubbing, new pavement, new retaining walls, concrete channel modifications, utility relocations, irrigation line modifications, landscaping improvements, additional right-of-way (including construction and noise wall easements), and electrical modifications. Existing Caltrans facilities, within the project area, will be evaluated for possible rehabilitation, repair or replacement as part of this project.

<u>Along SR-78</u>

The SR-78 roadway improvements for this project include the addition of two managed lanes, one lane in each direction. These lanes will be constructed along the existing median of SR-78 and will be constructed from the Twin Oaks Valley Road interchange to just west of the I-15/SR-78 Separation, where each lane connects to the proposed I-15/SR-78 managed lane connector. Extending the lanes to Twin Oaks Valley Road would bypass those SR-78 segments with the

highest traffic volumes and would allow for an unimpeded traffic flow pattern as the managed lane transitions to/from a general purpose lane.

From Twin Oaks Valley Road up to the proposed connector, these two lanes serving opposing directions of travel will be separated from one another by the existing concrete median barrier and by standard inside shoulder widths. In each single direction, the managed lane will be separated from the general purpose lanes by providing a buffer separation. The typical cross section of the managed lane would be a 10-foot inside shoulder and a 12-foot lane. A 4-foot striped buffer would separate this lane from the general purpose lanes. Two intermediate access points (IAPs) would be constructed at the Nordahl Road interchange and at the Twin Oaks Valley Road interchange.

Four existing structures along SR-78 will remain in place, be widened, or replaced. The Twin Oaks Valley Road Overcrossing (OC) and Nordahl Road OC will accommodate the proposed roadway improvements and will remain in place. As previously stated, the Woodland Parkway UC will be replaced with a longer and wider structure, and the Mission Road OH will be widened in the westbound direction.

With one exception, all of the existing on- and off-ramps at the SR-78 interchanges of Twin Oaks Valley Road, Woodland Parkway/Barham Drive, and Nordahl Road will be realigned to reconnect with the widened roadway. The eastbound on-ramp from Barham Drive will be relocated from its current location, which is approximately one mile east of the Woodland Parkway UC, to its new location just east of the Woodland Parkway/Barham Drive eastbound off-ramp.

In addition to the construction of the managed lanes, operational improvements are proposed for both directions of SR-78, which would handle the additional traffic volumes forecasted for YR 2040.

These improvements include the following:

- Extending the existing westbound (WB) auxiliary lane from Nordahl Road on-ramp to the Twin Oaks Valley off-ramp;
- An eastbound auxiliary lane between the Twin Oaks Valley Road on-ramp and the Woodland Parkway/Barham Drive off-ramp;
- An eastbound auxiliary lane between the Nordahl Road on-ramp and the existing I-15 southbound connector;
- A westbound acceleration lane at the Nordahl Road on-ramp to the I-15 southbound connector; and

- An eastbound acceleration lane from the Mission Road to the Nordahl Road off-ramp.

To provide for the additional width needed to construct the proposed direct connector, two managed lanes along the median, and the operational improvements, the SR-78 roadway will be widened to the outside by approximately 25-40 feet in each direction. Retaining walls will be needed along several segments of SR-78 to minimize impacts to local properties and local streets. Fixed objects within the clear recovery zone will be relocated, redesigned, or shielded, where feasible, per the Highway Design Manual standard and with concurrence from the Headquarters Project Delivery Coordinator and District Traffic Operations.

When the Woodland Parkway/Barham Drive UC is replaced, a portion of Barham Drive would be realigned to accommodate the relocated eastbound Barham Dr on-ramp and to improve local traffic circulation. Portions of Rancheros Drive and Carmel Street will be realigned to accommodate the roadway improvements on SR-78.

Along I-15

The segment of I-15 Express Lanes, within this project's limits, was constructed in 2011. Its design incorporated additional widths in the median to facilitate the construction of the proposed two-lane managed lane connector. Although outside widening on I-15 is not currently proposed, subsequent and more in-depth geometric studies may determine that additional width on I-15 is needed.

The existing express lanes that lead to and from the existing Hale DAR will be an option lane to serve both the DAR and the proposed connector. These two lanes, one in each direction, will tie into the connector approximately 350 feet north of the Hale UC. At this point, mechanically stabilized walls will be constructed to begin the grade separation between the I-15 facility and the connector.

Construction Phases

The improvements proposed by this project could be separated into three major construction phases based solely on the primary project features, as shown in Table 18.

The following phases are only a preliminary breakdown of construction activities to provide an overview of the order in which project elements must be constructed before subsequent features can be constructed (Exhibit 2a). A detailed construction staging plan will be developed in the design phase of this project.

Table 18
Preliminary Construction Phasing Summary

Improvements	Location	Phases		
		1	2	3
Managed Lane				
Woodland Pkwy UC (reconstruction)	Begin/End proposed UC structure	♦		
Managed Lane (ML) Connector Structure	I-15 north of Hale to east of Nordahl OC		✓	
WB Mission Rd OH (widening)	Begin/End existing OH structure	✓		
WB Managed Lane	East of Twin Oaks Valley OC to ML Connector		✓	
EB Managed Lane	East of Twin Oaks Valley OC to ML Connector		✓	
Operational				
WB Auxiliary Lane	Nordahl on-ramp to Twin Oaks Valley off-ramp	✓		
EB Auxiliary Lane	Twin Oaks Valley on-ramp to Barham/Woodland off-ramp			✓
EB Auxiliary Lane	Nordahl on-ramp to I-15 SB connector			✓
WB Deceleration Lane	West of Woodland UC to Twin Oaks Valley off-ramp			✓
WB Acceleration Lane	Nordahl on-ramp to east of Woodland UC			✓
EB Ramp Relocation	Relocate Barham/Woodland on-ramp 4,500 ft west of existing location	✓		
Local Road				
Barham Rd (relocation)	West of EB Barham off-ramp to Woodland Parkway	♦		
Rancheros Rd (realignment)	Mata Way to WB Barham/Woodland on-ramp	✓		
Carmel St (realignment)	SPRINTER UP, east of Twin Oaks Valley Rd., to Venture Street			✓

♦ Anticipated work by City of San Marcos ✓ Work to be done by Caltrans

Construction Phase 1

The major improvements included in the first construction phase include the work at and around the Barham Drive/Woodland Parkway interchange so that the other proposed project features can be staged and constructed with the least amount of impacts to existing traffic on SR-78.

The project features constructed within this phase include:

- Widening the Mission Road OH structure on its northern edge, along the westbound direction.
- Reconstruction of the existing Woodland Parkway UC to replace it with a wider and longer structure;

- Realigning the existing Barham Drive/Woodland Parkway eastbound off-ramp and westbound on- and off-ramps;
- Relocating the existing Barham Drive eastbound on-ramp westerly to be adjacent to the existing off-ramp;
- Extending the existing westbound auxiliary lane that currently ends just east of the Nordahl Road on-ramp to Twin Oaks Valley Road.
- Realignment of Rancheros Drive to accommodate the proposed auxiliary lane.

The Woodland Parkway UC bridge replacement, Mission Road OH widening, and extension of the existing westbound auxiliary lane must be the first order of construction work in order to provide the width needed to build the proposed managed lanes in the existing median and to provide adequate construction work areas. Without these improvements, the additional features constructed in the other stages would be precluded because staging of construction activities would be difficult to accomplish without adequate available width in the median and shoulders.

As shown in Table 18, it is anticipated that two of the six improvements built in this stage would be completed by the City of San Marcos.

Construction Phase 2

This construction phase would include the construction of the project features that would provide the managed lane portion of this project.

These improvements are:

- The construction of the proposed managed lane connector structure between I-15 and SR-78
- Construction of the managed lane, one lane in each direction, within the median of SR-78 from approximately east of the Twin Oaks Valley Road interchange to the connect

Construction Phase 3

This construction phase would construct the following recommended operational improvements provide congestion relief to traffic in the general purpose lanes and improves travel times to motorists traveling to the Nordahl Road and Woodland Parkway/Barham Drive interchanges:

- Extending a westbound auxiliary lane from the Nordahl Road interchange to the Twin Oaks Valley Road interchange;
- An auxiliary lane between the Nordahl Road on-ramp and the I-15 southbound connector;
- A deceleration lane at the westbound Twin Oaks Valley Road off-ramp; and
- An acceleration lane at the westbound Nordahl Road on-ramp.

In March 2015, two separate operational improvement projects were proposed to utilize available SHOPP funding for fiscal year 2016. Since the scope for both projects are also contained within the scope of this 15/78 connector project, these projects would use this PSR-PDS document to proceed to the PAED phase as standalone projects.

Option 3A (EA 42170_) would build an auxiliary lane in the westbound direction between the Twin Oaks Valley Road off-ramp and the Woodland Parkway/Barham Road on-ramp (Exhibit 7a). Option 3B (EA 42160_) would construct an auxiliary lane in the eastbound direction between the Twin Oaks Valley Road on-ramp and the Woodland Parkway/Barham Road off-ramp (Exhibit 7b), which is also one of the proposed roadway features for this 15/78 connector project. Both projects would reduce congestion within their respective segments by providing additional operational lane capacity for vehicles entering or exiting SR-78. Preliminary calculations, similar to those performed for Tables 1 and 2 of this report, indicate that these auxiliary lane projects could provide improved roadway operation up to year 2035.

Other Design Considerations

Design Exceptions

The highway design criteria and policies in the **Highway Design Manual (HDM)** serve as a guide for applying sound judgment in regards to project design. The design standards used for this project meet or exceed the minimums stated in the HDM to the fullest extent possible, except as noted below.

At this phase of the project, seven preliminary design exceptions have been identified for this project. Four mandatory and three advisory design exceptions, shown in Tables 19 and 20, apply to both alternatives. These identified design exceptions and those that may be identified in future design studies will be fully evaluated and addressed during the PAED phase.

Two Design Standards Risk Assessment tables, which provide the risk of these preliminary mandatory and advisory exceptions receiving approval, can be found in Section 14 Risks.

These design exceptions have been discussed with Luis Betancourt, Headquarters Project Delivery Coordinator, on June 11, 2014, and Tom Bouquin, District Division Chief of Design, on October 31, 2014.

Table 19
Mandatory Design Exceptions

Nonstandard Feature	HDM Standard
(a) Due to the existing SPRINTER light rail structure columns at the centerline and along the edge of pavement in both directions, the proposed shoulder widths may be less than standard width. (b) Along I-15, existing shoulder widths are 9.8 feet because the previous I-15 widening project was constructed using the then standard Metric units. (c) Along northbound I-15, the inside shoulder is reduced to 4 feet, for approximately 50 feet, as the two managed lanes diverge from one another. (d) Along southbound I-15, the existing outside shoulder along the lane leaving the Hale DAR is 4 feet.	HDM Index 302.1--Shoulder Width: **The shoulder widths given in Table 302.1 shall be the minimum continuous usable width of the paved shoulder on highways.-The HDM standard requires a 10' shoulder.**
(a) Due to the existing SPRINTER light rail structure columns at the centerline and along both edges of pavement, the proposed general purpose lanes may be reduced to 11 feet to provide for a minimum shoulder width on the Woodland Parkway UC structure. (b) Along I-15, existing lanes in both directions are 11.8 feet because the previous I-15 widening project was constructed using the then standard Metric units.	HDM Index 301.1--Lane Width: **The minimum lane width on two-lane and multilane highways, ramps, collector roads, and other appurtenant roadways shall be 12 feet**
The existing interchange spacing between the Nordahl Road OC and the I-15/SR-78 Separation is 2,000 feet (0.38 miles).	HDM Index 501.3—Spacing: **The minimum interchange spacing shall be one mile in urban areas, two miles in rural areas, and two miles between freeway-to-freeway inter-changes and other interchanges.**
The existing inside shoulders along SR-78, within the project limits, are sloped towards the centerline. This feature will be further studied and evaluated in the PAED phase.	HDM 302.2(2)—Cross Slopes: **In paved median sections, shoulders to the left of traffic shall be designed in the plane of the traveled way**

Table 20
Advisory Design Exceptions

Nonstandard Feature	HDM Standard
The proposed vertical curve for the Woodland Parkway WB off-ramp would not meet the minimum 50 mph stopping sight distance standard.	HDM Index 504.2(5)(a)—Vertical curves located just beyond the exit nose should be designed with a minimum 50 miles per hour stopping sight distance.
(a) The existing design speed of 25 mph would remain in use at the Barham Drive/Woodland Parkway westbound off-ramp. (b) The existing design speed of 25 mph would remain in use at the Barham Drive/Woodland Parkway eastbound off-ramp.	HDM Index 504.2(4)(a)—Freeway Entrances and Exits, Design Speed Considerations—Freeway Exit: The design speed at the exit nose should be 50 miles per hour or greater for both ramps and branch connections.
The proposed connector length is approximately 3,200 feet in length. The feasibility of including a passing lane in each direction on the proposed connector will be further studied and evaluated in the PAED phase.	HDM 504.4 (5)—Freeway-to-Freeway Connections, Single Lane Connections: Single lane connectors in excess of 1,000 feet in length should be widened to two lanes to provide for passing maneuvers (see Index 504.4(4).

Constructability Review

A Project Initiation Document (PID) level Constructability Review was conducted in September 2014 using Project Review Organizational System (PROS) electronic database to collect review recommendations. On September 16, 2014, a meeting was held with team reviewers to discuss potential constructability issues that may arise in subsequent phases.

A summary of the four major recommendations obtained from this review, which may significantly impact this project's footprint, schedule, and cost, are shown in Table 21.

Table 21
Summary of Constructability Review
Major Recommendations

	Recommendation Summary	Action Implemented
Connector Passing Lanes	Per HDM Index 504.4(5), passing lanes should be provided when the length of the connector exceeds 1,000 feet. The proposed connector has a length of over 3,200 feet.	• A preliminary assessment was requested in October 2014 to determine the feasibility of a 4-lane structure. • This recommendation was added to the Risk Register and Design Standards Risk Assessment tables for further study during PAED.
Geotechnical Studies	Unknown soil conditions for the proposed connector, bridge and retaining structures may require more intensive sampling and testing, which could increase project costs and affect the project schedule.	• This recommendation was added into the Risk Register. • Updated support cost estimates from the Geotechnical Department were obtained to plan for the potential of these studies.
Retaining Walls	Due to unknown geotechnical conditions and constrained construction work areas, alternate retaining systems and construction strategies may need to be implemented, which could impact project cost and footprint.	• This recommendation was added into the Risk Register. • Type selection and accessibility for maintenance activities will be evaluated during PAED when geotechnical studies have been initiated.
Median Shoulders	Per HDM Index 302.2, inside shoulders shall be in the same plane as the traveled way. Existing inside shoulders are sloped towards the centerline.	• This recommendation was added to the Design Standards Risk Assessment table for further study during PAED when hydraulic studies are initiated. • Updated support cost estimates from the Hydraulic Department were obtained.

Existing Soil and Geologic Formations

State Route 78 in San Diego County lies within the Peninsular Range Geomorphic Province of California. The province is characterized by Mesozoic age crystalline (typically granitic) basement rock, mountainous terrain, and sediment filled basins. The province is transected by numerous northwest trending ridges and valleys, and similarly trending strike-slip and dip-slip faults.

San Diego County sits upon the eastern margin of the Pacific Tectonic Plate. The region is seismically active as a result of relative movement between the Pacific Plate and North American Plate. Relative to the North American Plate the Pacific Plate moves northwestward at an annual rate of about one-inch (1.0in) per year. Tectonic stresses and strains associated with these plate movements have created a complex system of active, northwest trending faults typical to the region.

Major fault systems occurring near the project include the San Andreas, San Jacinto, Elsinore, and Rose Canyon Fault Zones. Additionally, complex systems of northwest trending faults occur offshore from San Diego. These offshore faults include the Coronado Banks and San Diego Trough Faults. All of these faults, as well as faults more distant from the project, are potential seismic sources that could cause minimal to moderate shaking at the project site.

The soils and geologic formations along SR-78 between the Cities of Oceanside and Escondido include the following units: 1) artificial fill, 2) stream valley alluvium, 3) sedimentary formation, 4) igneous granitic rock, and 5) metavolcanic and metasedimentary rock.

Within the San Marcos Valley, SR-78 is again underlain by Santiago Formation and stream valley alluvium. Between Twin Oaks Valley Road and Interstate 15, SR-78 traverses granitic, metavolcanic, and metasedimentary rock. The granitic rock just east of San Marcos is Green Valley Tonalite. East of Barham Drive, the country rock is dominated by metavolcanic and metasedimentary rocks that comprise the oldest basement rock in the San Diego region. This rock weathers to a reddish brown, clayey soil but contains abundant zones of hard rock.

Highway Planting

The proposed project will require excavation and grading of off-pavement areas to accommodate the project features. This disturbance will require revegetation procedures, with highway planting and/or erosion control measures, to meet project requirements prior to project approval. In addition, the proposed planted areas will require a temporary and/or permanent automatic irrigation system to sustain the health and integrity of the plant material through the plant establishment period.

As a result, highway planting and/or erosion control plans will be require for approval of this project. If the necessary project highway planting and irrigation improvements cannot be installed within the Caltrans capital cost limitation, a separate Highway Planting project will be programmed for this project. If a separate project is necessary, the Caltrans Project Manager will initiate the programming during project development of the roadway construction project.

In addition, whether or not a separate highway planting project is programmed, the proposed project will require an extended plant establishment period. The project will require a minimum three (3) year plant establishment period.

Transportation Management Plan (TMP)

The allocated budget for the Transportation Management Plan (TMP) is shown in this report (Exhibit 11). More details concerning the recommended TMP elements and the related budget will be developed during the PS&E phase of this project.

The PS&E phase should include the following:

- Public awareness campaign
- Traffic System & Signing Package
- Construction Zone Enhanced Enforcement Program (COZEEP)
- Advanced Transportation Management Systems (ATMS)
- Lane closure charts
- Detour Plans should be prepared during PS&E phase

Floodplain

According to the Federal Emergency Management Authority (FEMA) 2012 Flood Insurance Maps, there are no defined floodplains that would be impacted by this proposed project from Twin Oaks Valley Road interchange to I-15. Therefore, a Location Hydraulics Study will not be required along this segment of SR-71 during the PAED phase.

South of Hale Avenue Undercrossing in Escondido, I-15 crosses over the Escondido Creek floodplain. Since there is no planned new construction in the Escondido Creek floodplain, a Location Hydraulics Study will not be required for I-15 at Escondido Creek during the PAED phase.

Hydrology and Hydraulics

There are numerous concrete and unlined drainage ditches that run parallel to SR-78 on both sides of the freeway. Impacts to these ditches due to the proposed widening will require hydrology and hydraulic studies to address roadway improvement impacts. Additional right of way may be required for design and construction of on-site roadway detention basins necessary to accommodate the increased stormwater runoff due to the addition of new impervious areas.

Alternatives Considered But Rejected

SANDAG's 2050 RTP is formulated to encourage alternative modes of transportation such as carpooling and mass transit. Voters approved the TransNet Extension and Ordinance in 2004, which includes a funding allocation for the construction a managed lane connector. These

alternatives below would not improve the HOV system connectivity between the I-15 and SR 78. Detailed studies were not pursued.

Rejected--Widen Existing I-15/SR-78 Connectors

This alternative would require major reconstruction of the existing I-15/SR-78 Separation connectors to widen the NB15/WB78 connector and the EB78/SB15 connector. To accomplish the widening of these two existing connectors, these proposed structures would be constructed within a tightly constrained footprint due to the existing adjacent structures and roadways that comprise the remainder of the I-15/SR-78 Separation. Additional widening to both sides of I-15, south of the Separation, and to both directions of SR-78 would be needed to realign traffic with the widened connectors. Construction staging activities would cause significant impacts and delays to traffic along both the I-15 and SR-78 roadways.

Widening the existing connectors would add capacity, which would lessen the congestion on each of the connectors, but it would not address the weaving movements through the general purpose lanes from traffic that utilize the I-15 Express Lanes. Future connectivity between the I-15 Express Lanes and the future SR-78 managed lanes between I-5 and I-15 would not be provided. This alternative would exceed the total project costs of the other proposed alternatives, and right of way and environmental impacts would increase.

Rejected--Operational Improvements Only

This alternative would construct only operational improvements along SR-78. These improvements may improve traffic operations in isolated point locations or segments, but as a whole they would not address the need and purpose of this project to minimize congestion on the existing I-15/SR-78 connectors and to provide future connectivity between the I-15 Express Lanes and the future SR-78 managed lanes between I-5 and I-15.

Rejected—Convert Existing Connector Lanes to a Managed Lane

This alternative would convert one of the two lanes along each connector structure to a managed lane. Changing the lane configuration on the connectors to one managed lane and one general purpose lane would create longer queues during the peak hours as the capacity for general purpose vehicles is decreased. Longer queues would impact the operation on both I-15 and SR-78 roadways as queued traffic blocks ramp and/or through movements along both facilities. Traffic that uses the I-15 Express Lanes would continue to weave through the I-15 general purpose lanes to enter or exit the existing managed lane facility. In order for this alternative to

function properly, the converted managed lanes would need to connect directly to the I-15 Express Lanes, which would require major reconstruction.

The need and purpose of this project would not be fulfilled because this alternative would decrease capacity on the existing connectors and increase congestion, delays and queues. Future connectivity between the I-15 Express Lanes and the future SR-78 managed lanes between I-5 and I-15 would not be provided.

Rejected—Express Toll Lanes

This alternative would construct a tolled managed lane connector between the I-15 Express Lanes and the future proposed managed lanes on SR-78. All HOV and FasTrak vehicles, excluding transit, would be charged a fee to use the connector. Vehicles that are traveling northbound on the I-15 Express Lanes would need to make a decision before reaching Citracado Parkway to remain on the facility and pay the pricing fee at the proposed connector or to exit at the existing IAP to utilize the existing connector to SR-78. In the eastbound SR-78 direction, traffic wanting to connect to southbound I-15 would also need to use the existing southbound I-15 connector or choose to pay the pricing fee.

Although future connectivity would be provided, full capacity on the proposed connector would not be reached with this alternative, as most drivers would most likely elect to use the existing I-15/SR-78 connectors.

8. RIGHT OF WAY

Project improvements are generally within the existing right of way. Parcel acquisitions are required at Woodland Parkway, Barham Drive and Rancheros Drive. Temporary construction easements (TCEs) are concentrated just to the east of Twin Oaks Valley Road and the segment between Mission Road Overhead (OH) and the Nordahl Road interchange. Utility relocations involve mainly electrical lines. Within the project limits, existing railroad tracks cross the SR 78 three times and the I-15 once. A Right of Way Data Sheet is included (Exhibit 10).

Acquisition

The land zones impacted are residential, commercial, industrial, and unzoned.

Partial acquisition of one parcel, which is owned by Grace International Churches and Ministries Incorporated, is needed for the City of San Marcos’s Barham Drive/Woodland Parkway

improvements. This acquisition is not needed for freeway improvements, but it is needed by the City of San Marcos to widen the Woodland Pkwy UC and to realign Barham Drive. This parcel is currently use by Grace International for overflow parking during their church services. After the construction work is completed, the eastern portion of the parcel could be returned to Grace International with paved parking.

This project requires seventeen partial acquisitions for the proposed SR-78 roadway improvements. Eight are public agency properties, two are residential and the remaining seven are industrial/commercial or unzoned properties. They include:

- East of Mission Road on the north side at Costco - One parcel.
- Woodland Parkway/Rancheros Drive intersection widening - Five parcels.
- Westbound SR-78 Woodland Parkway on ramp realignment - One parcel.
- SR 78 Barham Drive on and off ramp realignment - Two parcels.
- Barham Drive just west of Woodland Parkway realignment - Five parcels.
- Rancheros Drive realignment just west of Woodland Parkway - Three parcels.

TCEs are rights of use by the State or a Local Agency. For this project, the TCEs will be used to gain access to a roadway facility in order to make the necessary improvements. A total of 32 TCEs are required for this project, which include:

- Mission OH to Nordahl Road - Seventeen TCEs are required to build the managed lanes and the additional auxiliary lane. Six properties are residential and the other eleven are industrial/commercial.
- Woodland Pkwy UC to Mission OH - Seven TCEs are required on parcels between WB SR-78 and Rancheros Rd. All of these parcels are industrial/commercial.
- Twin Oaks Valley Rd to Woodland Pkwy - Seven TCEs are required along East Carmel Street. All seven are industrial/commercial properties. One TCE is required along the property between the WB SR-78 off-ramp and Rancheros Drive, which is also a commercial property.

Impacted bike and pedestrian facilities will be replaced in kind or rebuilt to the current design standards.

Railroad

The North County Transit District (NCTD) currently operates the *SPRINTER* light rail system which is a 22 mile east-west commuter route serving the cities of Oceanside, Vista, San Marcos and Escondido. There are 15 stations with service every 30 minutes between the hours of 4 am

and 9 pm. Burlington Northern Santa Fe (BNSF) freight trains also use the system when the *SPRINTER* is not being operated.

The SPRINTER's railroad tracks cross I-15 at:

- West Washington Avenue (Santa Fe Ave) OH (Br No. 57-0812) - managed lane connectors will be built over the existing railroad, but columns will not be required within the railroad right of way.

The SPRINTER's railroad tracks cross SR-78 at three locations within the project limits:

- SR-78 Underpass No. 1 (Br No. 57-1105) – Just east of Twin Oaks Valley Road interchange. No modifications required. Improvements built under structure.
- SR-78 Underpass No. 2 (Br No. 57-1106) – Just east of the Woodland Pkwy Undercrossing. No modifications required. Freeway improvements and Woodland Parkway interchange modifications will be done without impacting this Underpass.
- Mission Rd Overhead (Br No. 57-0135) – The widening of this structure is one of three improvements listed as required preliminary work for this project. For a detailed discussion, see Section 7 Alternatives—Construction Phasing,

A formal application with the California Public Utilities Commission (CPUC) will be required for any new or widened structure over the existing railroad tracks. This is to obtain new easements from the NCTD. It will require a long lead time and has been incorporated in the project schedule. Additional consultation with NCTD will be required for work adjacent to bridge columns at Underpass No. 1 and Underpass No. 2.

Utilities

Various utility lines are operating with the right of way of the project limits. These include:

- Gas and electric lines: San Diego Gas & Electric (SDG&E);
- Telecommunications lines: AT&T, Sunesys, Level 3, QWEST, SBC, and Time Warner Cable;
- Water and sewer lines: Rincon del Diablo Water, City of San Marcos, and Valecitos Water District.

High voltage electrical lines cross over I-15 just north of West Washington Avenue. With the construction of the managed lane connector structure over the southbound I-15 lane, the clearance between the high voltage lines and the new structure is insufficient. It was determined that the SDG&E lines will need to be elevated to restore clearance from the roadway. This is

expected to require the transfer of the wiring to 4 taller poles, 2 on each side of I-15. The approximate costs for installing the poles are $150,000 per pole, for a total of $600,000 for this project.

Escondido has a “franchise” agreement with SDG&E, which means that these costs are equally shared between the two agencies. The amount of $300,000 was used in the project estimate for this work.

Approximately 1,300 ft of electrical power lines will be placed underground along the south side of SR-78, east of Twin Oaks Valley Road, at East Carmel Street.

Utility identifications, searches and protection/relocation requirements within the project limits will be further evaluated in the next project phases.

State Facilities

The following State facilities will be identified for possible rehabilitation, removal or replacement during subsequent phases of this project:

- Fiber optic lines
- Existing irrigation service lines (low pressure)
- Existing water meters
- Existing traffic, utility and landscape cabinets

Other State facilities, not mentioned above, will be also be evaluated for possible rehabilitation, repair, or replacement as part of this project.

9. STAKEHOLDER INVOLVEMENT

This project falls within the limits of the City of Escondido and the City of San Marcos. SANDAG serves as the intermediary between Caltrans and the Local Agencies.

In early spring 2014, the City of San Marcos (City) and Caltrans met to discuss this project’s scope and schedule and its dependence on the construction of the City’s proposed improvements for the Woodland Parkway interchange, which includes the replacement of the existing bridge structure (Exhibit 2b). Both agencies are committed to participating in a joint effort with regional partners to ensure that both projects are able to move forward towards future construction. In a letter from the City to Caltrans, dated April 23, 2014, the City stated its readiness to deliver the Woodland Parkway project, while not precluding future SR-78 managed lane connectivity, and

"to provide the region with a significant benefit while at the same time resolving local traffic issues and preparing that part of the City for the future growth of Cal State San Marcos and other economic activity generating projects."

Context Sensitive Solutions

The Context Sensitive Solutions (CSS) approach is being used to design this project. Impacts to local streets at Rancheros Drive and Barham Drive are being mitigated by upgrading sidewalk widths to the current standard of 8 feet where feasible. Impacts to Carmel Street will include adding sidewalks and burying electrical lines. Protecting pedestrians and cyclist during construction of the Inland Rail Trail will be done with minimal closures during construction. The Department will work with local agencies to address improvements to local facilities as well.

10. ENVIRONMENTAL DETERMINATION/DOCUMENT

Environmental Constraints

Caltrans is the lead agency for the California Environmental Quality Act (CEQA) compliance and the National Environmental Policy Act (NEPA) compliance pursuant to 23 USC 327 as amended by Moving Ahead for Progress in the 21st Century (MAP-21).

An Initial Study (with Mitigated Negative Declaration)/Environmental Assessment (with Finding of No Significant Impact) is the anticipated environmental document for this project.

Below are the technical summaries from the Preliminary Environmental Analysis Report (PEAR) for this project, which was finalized on March 12, 2015 (Exhibit 12).

Community Impacts

It is anticipated that a mid-level Community Impact Analysis would be prepared for this project.

The community impacts anticipated for this project include:

- Temporary construction impacts, such as traffic detours, closures of on- and off-ramps, noise and dust.
- Public service delivery such as fire, ambulance, police or educational services, would be disrupted.

- Potential detours and temporary changes of access to businesses within the project area may be temporarily impact the local economy.

Visual/Aesthetic

It is anticipated the proposed project will result in impacts to the visual setting. As a result, these impacts should be identified, with the context of existing conditions, and analyzed in a Visual Impact Assessment (VIA). The VIA will analyze all alternatives for consistency with assessment standards stipulated in the Federal Highway Administration (FHWA) and Caltrans guidance.

Consistent with this guidance, the assessment will include recommended avoidance, minimization, and/or mitigation measures for the proposed project features. These proposed features include: widening and/or replacement of existing bridge structures; a proposed managed lane connector (flyover); retaining walls; soundwalls; concrete barriers; and potential gore and slope paving. The recommended measures will include a description and/or depiction of recommended aesthetic design features and include preferred material types, textures, and hues (colors).

Visual/Landscape

To minimize visual impacts, disturbed planting and irrigation systems are to be replaced and roadside landscape developed. Buffer landscaping that respects the clear recovery zone constraints is to be planted. Built features will be minimized in scale and shall receive architectural treatment that is compatible with the corridor. Walls will be screened with shrub planting or vine planting when appropriate and space is available.

As part of the highway, construction limited planting and irrigation will be installed and will require a 1-year plant establishment. The ultimate planting and irrigation will be installed with a separate contract for highway planting and will include a 3-year plant establishment period.

Water Quality and Storm Water Runoff

A Storm Water Data Report (SWDR) Long Form with a completed Appendix E checklist will be required. The SWDR will include documentation of pollutant potential and appropriate Best Management Practices (BMPs). Prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared.

The project has a total disturbed soil area of 16 acres and is Risk Level 2. It is the goal of the project to treat all added impervious areas created by the project. The preferred treatment

methods for this project will be determined in subsequent phases, when more detailed data becomes available.

Hazardous Waste/Materials

Widening activities may invoke the Department of Toxic Substances Control lead variance for soil excavated within the shoulders. Soil in the shoulders along SR-78, to a depth of 3 feet and at a distance of 30 feet from the traveled way, may be at hazardous levels with regard to soluble Aerially Deposited Lead (ADL) concentrations.

A Phase I environmental site assessment will be performed for the subject project. It will include study of the project location and immediate vicinity and will address the potential for encountering aerially deposited lead, lead based paint in traffic stripe and pavement marking material, treated wood waste, and asbestos containing materials that may be removed during construction.

The appropriate measures needed to handle soils with hazardous materials will be determined in subsequent project phases and before construction of the project features. Possible measures include reusing the soil within the project limits by using a clean soil top layer and ensuring adequate depths above the existing groundwater table or disposing the soil if it cannot be reused on site.

For a list of properties with the potential to encounter hazardous waste, see the Preliminary Environmental Analysis Report (PEAR), which is Exhibit 12.

Air Quality

The project proposes two alternatives in the County of San Diego, which is located in the San Diego Air Basin (SDAB). The U.S. Environmental Protection Agency (EPA) designated the SDAB as non-attainment for the federal 8-Hour Ozone standard. An Air Quality Study will be conducted that will measure CO, PM2.5, PM10, and MSATs levels.

It is not anticipated that the project will increase the frequency and severity of any existing exceedences.

Noise and Vibration

North of the proposed SR-78 alignment, there are 5 single-family houses built in 1967 that are legal residences but are not conforming because they are located in areas that are zoned commercial. Regardless of their zoning, these five houses are “Grandfathered In” as legal residences and can be legally considered as frequent outdoor human use areas of single-family residential dwellings.

A noise study would be completed during the PAED phase. The noise study includes short-term and long-term noise measurements, roadway traffic noise modeling using FHWA’s Traffic Noise Model (TNM), and a traffic noise impact analysis.

Once a noise study has been completed, a Noise Abatement Decision Report would then determine if any proposed noise abatement strategies, such as the construction of a masonry block sound wall, would be reasonable and feasible.

Biology

A Natural Environment Study (Minimal Impacts) [NESMI] describing the existing biological environment of the project setting and how the project alternatives will affect that environment will be completed during PAED. This study summarizes technical studies, such as biological assessments, wetland assessments, and focused species studies, for inclusion in the final environmental document. The NESMI forms the basis for discussions with the resource agencies to establish mitigation measures and whether permits will be required.

Much of the area within the project limits consists of disturbed habitat. In the City of San Marcos, it is surrounded by mixed commercial and residential urban development, and in the City of Escondido, it is comprised of buildings, parking lots, associated landscaping and other areas of pavement/asphalt surfaces with graded and disturbed soils.

For proposed graded areas within the project limits, the following measures will be proposed:

- Seed graded areas with appropriate native erosion control mix.
- Use of specific native seed mixes for bioswales, detention basins and their associated slopes.
- Any native trees that are removed, including oaks, will be replaced.
- Any vegetation clearing, including tree removal, will be limited to a time of year that is outside the breeding season to avoid impacts to nesting birds.

Storm Water Pollution Prevention Plan

On July 15, 1999 State Water Resources Control Board (SWRCB), adopted Order 99-06 DWQ, National Pollutant Discharge Elimination System (NPDES) Permit For Storm Water Discharges from the State of California Department of Transportation (Caltrans) Properties, Facilities and Activities. This project would be designed in conformance with the NPDES Permit requirements and Appendix E of the Caltrans Project Planning and Design Guide (PPDG). Appendix E consists of documentation for storm water quality design issues through the development of a Storm Water Data Report (SWDR) Evaluation and Documentation Form for incorporation of Treatment Best Managed Practices (BMPs).

A PID level SWDR has been completed for this phase of the project on February 5, 2015 (Exhibit 13). Subsequent phases will prepare SWDRs as more detailed design and site information is obtained to identify site data, storm water quality design issues and BMPs designed to minimize pollution potential. The SWDR would also identify permanent treatment BMP's that would be incorporated into the projects, as well as Construction BMPs, and Design Pollution Prevention BMPs as determined appropriate.

11. FUNDING

Various funding sources could be available for this project. Funding for this project may come from the STIP, from the SANDAG TransNet Ordinance, and State funding. It has been determined that this project is eligible for federal-aid funding.

Since the two build alternatives have the same overall geometry, the project estimate is the same for both Alternative1-HOV Only and Alternative 2-Express Lanes. Table 22 shows the escalated capital outlay project estimate for the project. This cost estimate also includes the $18 million to $27 million, in YR 2020 dollars, that is estimated for the Woodland Parkway bridge replacement and existing off-ramp realignments, in the event that the City of San Marcos does not obtain the funding needed for their proposed local improvements project.

Table 22
Capital Outlay Project Estimate
Escalated Costs (YR 2024)

Construction Cost	Right of Way	Support Cost
$ millions	$ millions	$ millions
248.4	22.0	47.1

The level of detail available to develop these capital outlay project estimates is only accurate and useful for long-range planning purposes only. The capital outlay project estimates should not be used to program or commit State-programmed capital outlay funds.

Capital Outlay Support Estimate

The capital outlay support estimate for programming PA&ED in the 2016 STIP for this project is **$6.96 Million**.

12. SCHEDULE

Table 23 provides the tentative project schedule for this project. Once this Project Initiation Document is finalized, the dates for the next phases will be determined based on the region's priorities and funding availability.

Table 23
Tentative Project Schedule

Milestone	Month/Year
Approve PID	3/2015
PA&ED	7/2020
PS&E	6/2023
RTL	10/2023
Begin Construction	2/2024
End Construction	TBD[1]
End Project	TBD

[1]TBD=To Be Determined

The anticipated funding fiscal year for construction is 2023/2024.

13. RISKS

Project Delivery Directive 09 (PD-09) requires that risk management be applied to all capital and major maintenance projects for which the Department has delivery responsibility. Project Risk Management (PRM) is the process used to plan, analyze, identify, communicate, manage and respond to project risks through all phases of project delivery. As the total project cost is anticipated to surpass $100 million, a Risk Register with Quantitative Analyses is required.

The Risk Register is a document that identifies all known risks that could have a severe impact to the project in regards to cost, schedule, scope and quality of the work. It contains a list of all identified risks and provides a process of numerically (cost and schedule) analyzing the effects of

the known risks. It also serves as an effective way to communicate risks to the next phase of the project.

FHWA, Caltrans and SANDAG will meet annually to conduct a Project Review and implement the principles of PRM which includes: assessing risk, prioritizing risk events and implementing response strategies to effectively manage risk.

Risk Register

The Risk Register, shown in Exhibit 14, identifies items that could significantly alter this project's cost and schedule at this current phase of the project. Table 24 is a brief description of those risks that have been identified to have an overall high risk assessment. The Risk Register was certified on March 18, 2015.

Table 24
Project Risks
with a High Assessment

Risk	Description of Risk
Passing Lanes on HOV Connector Structure	The connector structure geometry, including the connection points with both roadways and the possibility of a wider structure to allow for passing maneuvers, may increase R/W impacts, construction costs, impacts to existing traffic, and impacts to the project schedule.
Design Exceptions for Managed Lane Transition Geometry	Design exceptions for the roadway leading to the managed lane connector, which have a low to medium probability for approval, may cause the design to be reevaluated until a sufficient solution can be found, which would impact project schedule and/or cost.
Geotechnical Studies	Additional geotechnical testing and study for unknown soil and foundation issues may be needed, which would influence the selection of retaining walls types, structure foundations, and construction methods. These selections would impact project schedule and increase project cost.
Existing Detention Basin	Impacts to the existing detention basin at the southwest quadrant of the 15/78 Separation would require reconstruction using current standards and/or possible R/W acquisition if the existing site is no longer usable, which would impact project scope, cost and schedule.
Existing Channel	Impacts to the existing channel between Nordahl Road and the southbound 15 connector cannot be upgraded to current standards, which will impact project scope and schedule.
New Detention/Retention Basins	New basins may be required to avoid any increase of flow into the San Marcos Creek and its tributaries, which will increase project costs and impact project scope and schedule.

A three point estimate is used for cost and schedule impacts. The risk probability ranking is used with the time, cost, and scope impact to get a risk ranking. At this phase, the risk determination

is a qualitative analysis, which utilizes a risk score. In subsequent phases, a quantitative assessment will be developed by assigning a cost calculation to each identified risk, which will be determined at a later phase of the project.

Because no items currently present a major risk to the project, a contingency level of 30% was selected for use in the 11-Page Cost Estimates. Project Risk meetings will be held throughout the subsequent phases of the project.

Design Standards Risk Assessment

A Design Standards Risk Assessment for both mandatory and advisory design exceptions is provided in Tables 25 and 26, respectively, to discuss the probability of a design exception being approved in a later project phase. This table was discussed with Luis Betancourt, Headquarters Project Delivery Coordinator, on June 11, 2014, and Tom Bouquin, District Division Chief of Design, on October 31, 2014.

Table 25
Mandatory Design Standards Risk Assessment

Design Standard from HDM	Probability of Design Exception Approval	Justification for Probability Rating
HDM. 302.1: The shoulder widths given in Table 302.1 shall by the minimum continuous usable width of the paved shoulder.	1. High 2. Medium	1. Existing I-15 shoulder widths were constructed using Metric units, which was standard at that time. 2. Insufficient design data to ensure that preliminary proposed shoulder widths and spot locations are acceptable.
HDM. 301.1: The traveled way width for new construction on two-lane and multilane highways, ramps, collector roads, other appurtenant roadways shall be 12 feet.	1. High 2. Medium	1. Existing I-15 lane widths were constructed using Metric units, which was standard at that time. 2. Insufficient design data to ensure that preliminary proposed lane widths are acceptable.
HDM 501.3: The minimum interchange spacing shall be one mile in urban areas and two miles between freeway-to freeway interchanges and local street interchanges.	High	Interchange spacing is an existing condition.
HDM 302.2(2) In paved median sections, shoulders to the left of traffic shall be designed in the plane of the traveled way.	Medium	Existing condition. Drainage conditions will be studied further in subsequent project phases.

Table 26
Advisory Design Standards Risk Assessment

Design Standard from HDM	Probability of Design Exception Approval	Justification for Probability Rating
HDM. 504.2 (5) Vertical curves located just beyond the exit nose should be designed with a minimum 50 mph stopping sight distance.	Medium	Design details that put the proposed exception in context with other design considerations and impacts are not known at this time.
HDM 504.2 (a) The design speed at the inlet nose should be consistent with approach alignment standards.	Medium	Design details that put the proposed exception in context with other design considerations and impacts are not known at this time.
HDM 504.4(5) Single lane connectors in excess of 1,000 feet in length should be widened to two lanes to provide for passing maneuvers (see Index 504.4(4))	Medium	Design details that put the proposed exception in context with other design considerations and impacts are not known at this time.

14. FHWA COORDINATION

This Report was initially reviewed by Manuel E. Sánchez, Federal Highway Administration (FHWA) Project Oversight Manager (POM), on January 23, 2014 and was also reviewed by the current FHWA POM, Jacob Waclaw, on September 10, 2014.

Per Moving Ahead for Progress in the 21st Century Act (MAP 21), this project is eligible for federal-aid funding and is considered to be FULL OVERSIGHT under current FHWA-Caltrans Stewardship Agreements.

Due to its proposed preliminary design features, this project is eligible to be selected as a High Profile Project (HPP). However, due to this project's low risk nature, an HPP designation was not selected by the FHWA POM. This project will be considered a Delegated Project and approval authority will follow that outlined in the "Delegated Projects – NHS/Non-NHS" column of the Project Responsibilities List in Appendix B of the Project Development Procedures Manual (PDPM).

For Delegated Projects, Caltrans will have approval authority for all aspects of a Federal-aid project, except those which may not be delegated by federal law (requiring FHWA approval). For the Delegated Projects, FHWA will verify compliance with federal regulations via annual program and process reviews. **(**Exhibit 15**)**

15. PROJECT REVIEWS

	Name	Date
Headquarters Project Delivery Coordinator	Luis Betancourt	June 11, 2014
Project Manager	Karen Jewel	January 16, 2015
FHWA Project Oversight Manager (Previous)	Manuel Sanchez	January 23, 2014
FHWA Project Oversight Manager (Current)	Jacob Waclaw	September 10, 2014
Constructability Review	Javier Alonso	September 16, 2014
Risk Management Coordinator	Pedro Maria-Sanchez	February 6, 2015

16. PROJECT PERSONNEL

Rachel Mueller, PE	Project Engineer	(619) 688-3679
Victor Cardenas, PE	Design Manager	(619) 688-3670
Karen Jewel, PE	Project Manager	(619) 688-3803
Dennis Jung	Environmental Generalist	(619) 688-0266
Amy Lamott Vargas	Right of Way	(619) 688-6944
Guy Poirier, PE	Freeway Operations	(619) 688-3235
Lawrence Emerson, PE	Traffic Systems Ramp Meter	(858) 467-3073
Azar Habibafshar, PE	Environmental Engineer	(619) 688-3192
Pedro Maria-Sanchez	Risk Analysis	(619) 718-7821
Steve Warren	Landscape Architect	(619) 688-3100
Rajpreet Singh	Design Electrical	(619) 688-3248
Antonio Araullo	NPDES	(619) 688-6436

18. ATTACHMENTS

Exhibit 1	Title Sheet
Exhibit 2a	Project Overview and Preliminary Construction Phases
Exhibit 2b	City of San Marcos—Proposed Woodland Parkway Improvements
Exhibit 3	Typical Cross Section
Exhibit 4	Layouts
Exhibit 5	Traffic Volumes—Existing YR 2013, Build YR 2020 and Horizon YR 2040
Exhibit 6	SR-78 Existing Speed Graphs
Exhibit 7	Project Cost Estimate
Exhibit 7a	Option 3A Cost Summary
Exhibit 7b	Option 3B Cost Summary
Exhibit 8	Advance Planning Study (APS)
Exhibit 9	Structural Section Recommendation
Exhibit 10	Right of Way Data Sheet
Exhibit 11	Traffic Management Plan (TMP) Data Sheet
Exhibit 12	Preliminary Environmental Assessment Report (PEAR)
Exhibit 13	Storm Water Data Report
Exhibit 14	Risk Register
Exhibit 15	Record of FHWA Involvement and Appendix B
Exhibit 16	San Diego Regional HOV/Managed Lanes Systems Planning and Implementation Guide
Exhibit 17	Support Cost Estimate Summary
Exhibit 18	Project Milestones
Exhibit 19	ETC Details for Project
Exhibit 20	D11 Financials

INDEX OF PLANS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	15,78	R30.8/ R32.0, R12.6/R16.7	1	1

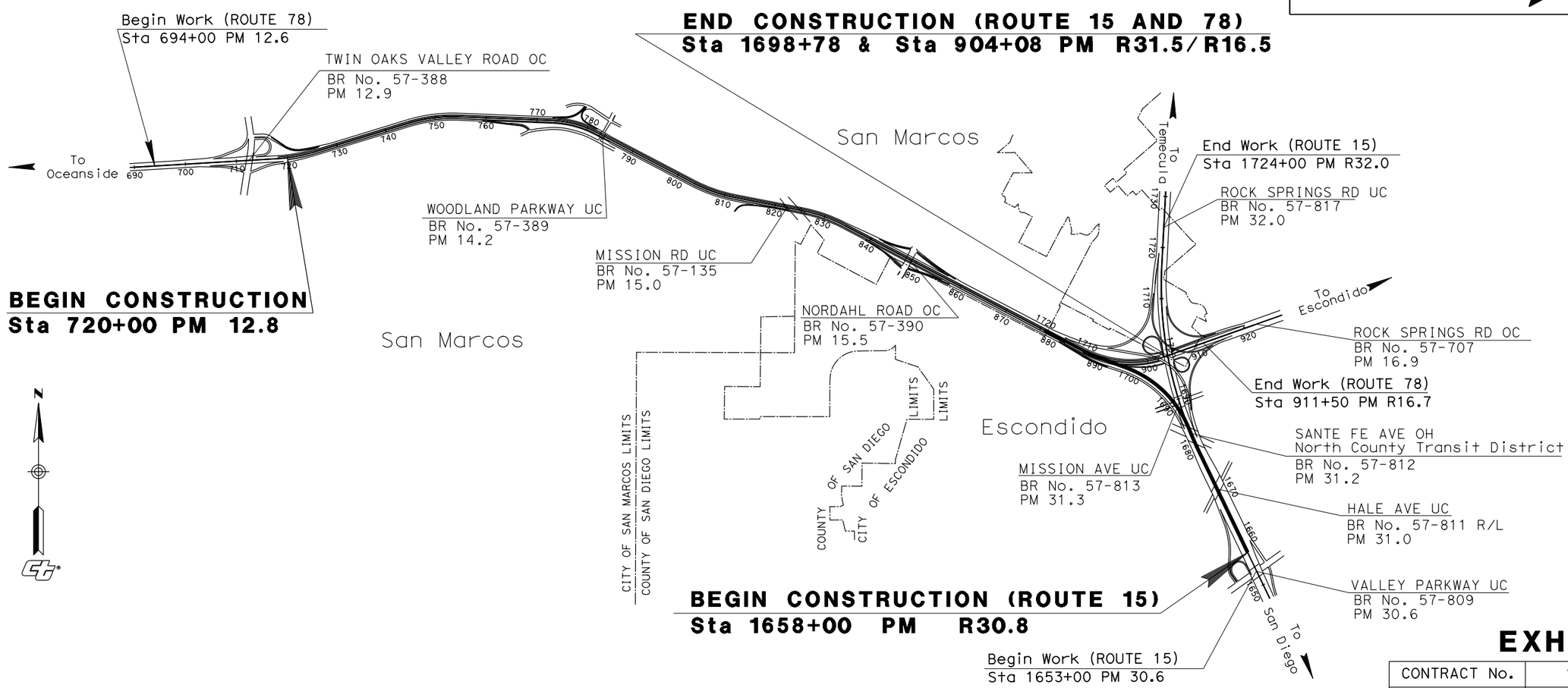
LOCATION MAP

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN SAN DIEGO COUNTY
IN AND NEAR ESCONDIDO AND SAN MARCOS
ON ROUTE 15 FROM 0.4 MILE SOUTH OF HALE AVENUE UNDERCROSSING
TO 0.5 MILE NORTH OF THE ROUTE 15/78 SEPARATION AND
ON ROUTE 78 FROM 0.3 MILE WEST OF TWIN OAKS VALLEY ROAD OVERCROSSING
TO 0.2 MILE WEST OF THE ROCK SPRINGS OVERCROSSING.

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010



NO SCALE

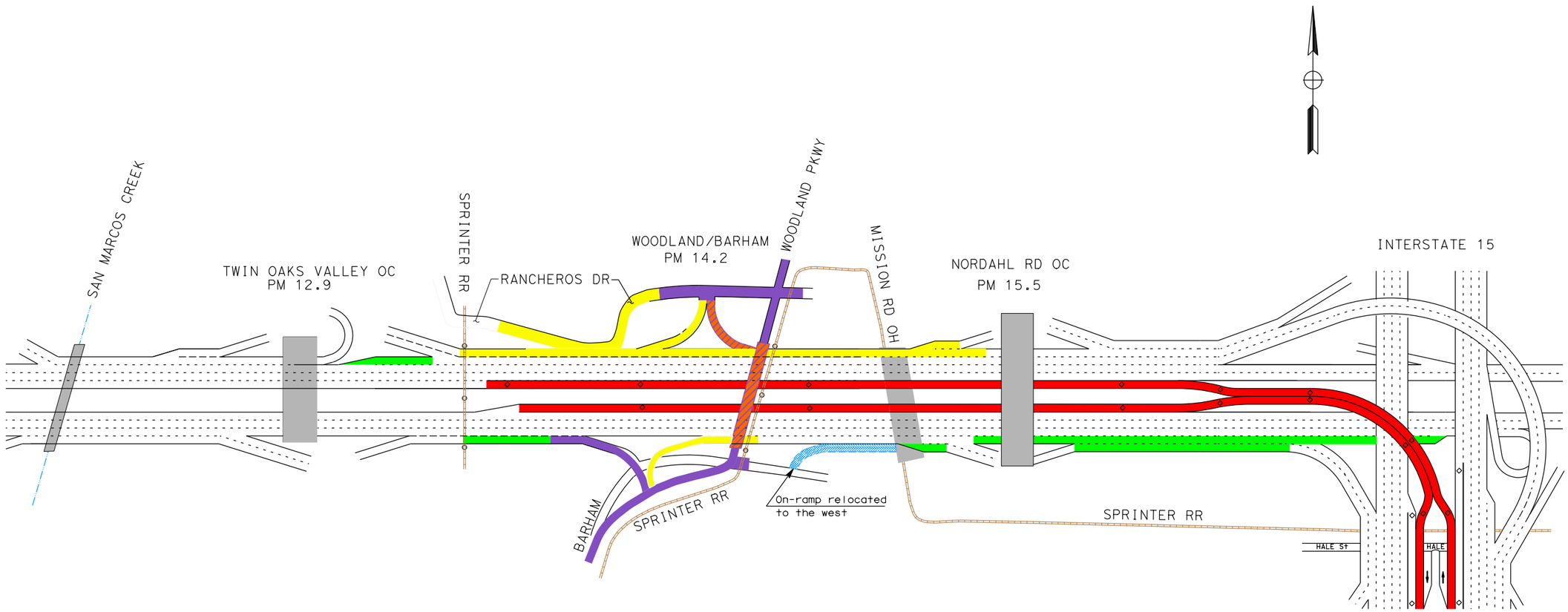
EXHIBIT 1

CONTRACT No.	11-2T240K
PROJECT ID	1112000131

PROJECT MANAGER: KAREN JEWEL
DESIGN MANAGER: RACHEL MUELLER

LAST REVISION: 01-06-15
DATE PLOTTED => 21-JAN-2015
TIME PLOTTED => 09:42

BORDER LAST REVISED 10/4/2013 | CALTRANS WEB SITE IS: HTTP//WWW.DOT.CA.GOV/ | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s127584 DGN FILE => Title_2T240K_150106.dgn | UNIT 2765 | PROJECT NUMBER & PHASE 1112000131K



I-15/SR-78 Construction Phases		
	Phase	**Proposed Improvements**
	Phase 1	Improvements done by others: -Replace Woodland Pkwy UC -Local Street Improvements
		Widen Mission Rd OH WB Auxiliary Lane Relocate EB Barham On-ramp
	Phase 2	Managed Lane Connector Structure Managed Lane in Each Direction
	Phase 3	Operational Improvements

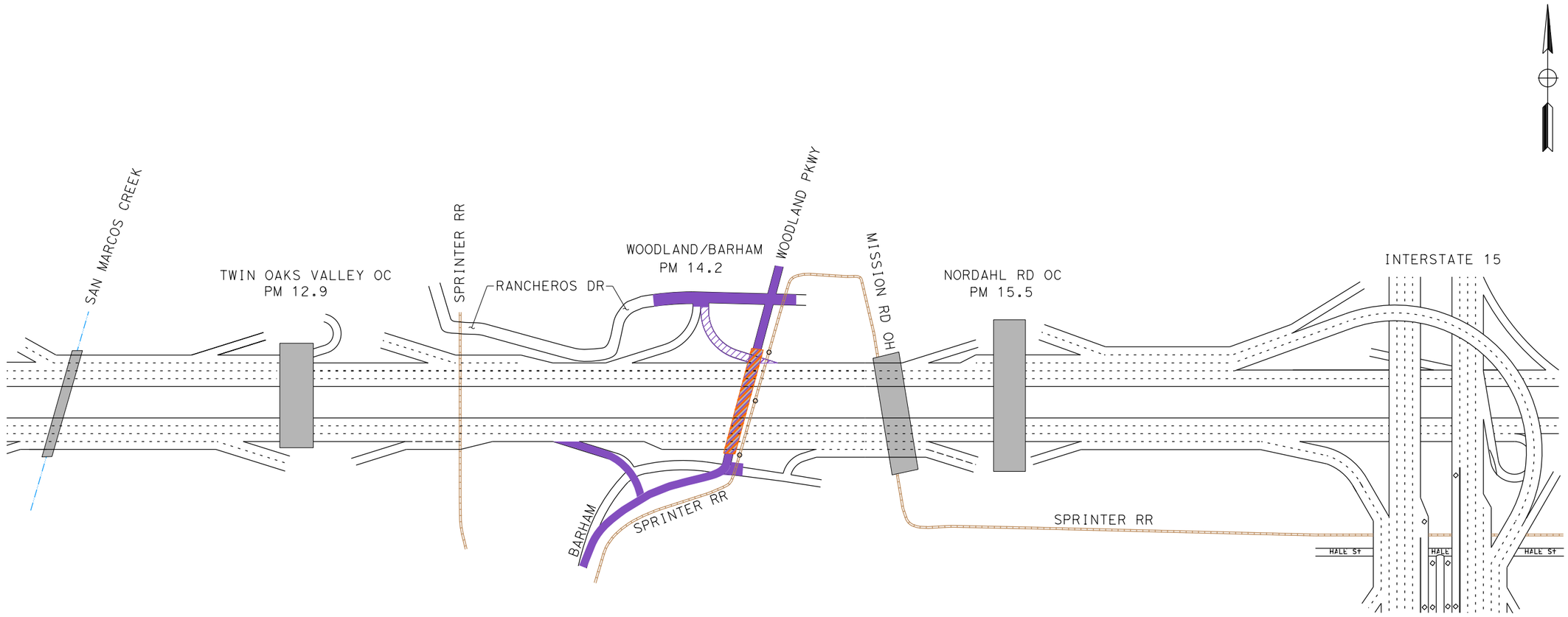
Legend

- Existing Structure
- SR-78 Improvements Done by Others
- Local Street Improvements Done by Others

I-15/SR-78 Managed Lane Connector Project
Project Overview and
Preliminary Construction Phases

Exhibit 2a

Not To Scale



PROPOSED CITY IMPROVEMENTS		
	Proposed City Street Improvments	• Construction can proceed at any time; limited interaction with SR-78 operation.
	Replace Woodland Pkwy Structure	• Extensive construction phasing required for structure replacement.
	Realignment of Woodland/Barham WB Off-Ramp	• Ramps would be rebuilt during future SR-78 managed lanes construction.
	Existing Structure	

City of San Marcos
Proposed Woodland Parkway Improvements

Exhibit 2b

No Scale

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	78	15.5/R16.5		

REGISTERED CIVIL ENGINEER DATE

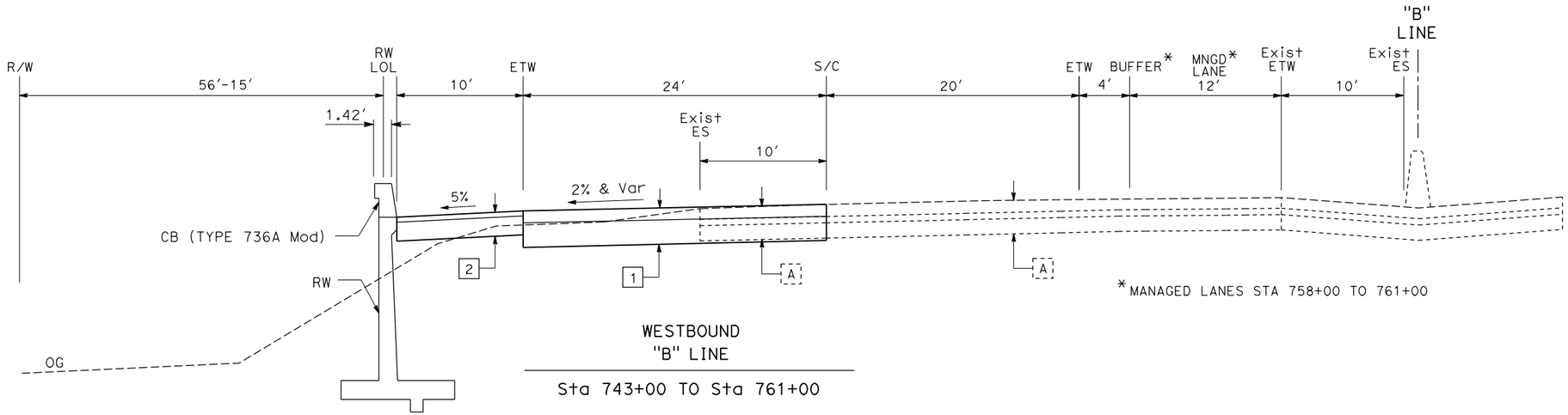
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

TYPICAL PAVEMENT STRUCTURAL SECTIONS

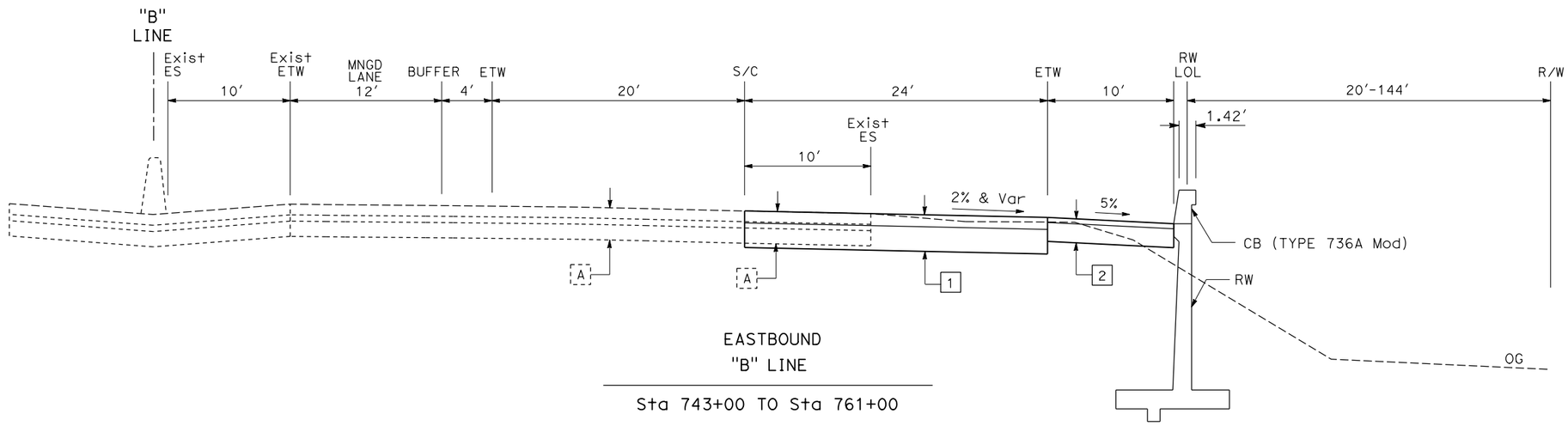
MAIN LANE — [1] 0.95′ HMA-A, 1.95′ CLASS 2 AB — [A] 0.83′ HMA, 0.50′ AB, 1.21′ AS

MAIN LANE SHOULDER — [2] 0.40′ HMA-A, 1.50′ CLASS 2 AB



WESTBOUND
"B" LINE

Sta 743+00 TO Sta 761+00



EASTBOUND
"B" LINE

Sta 743+00 TO Sta 761+00

MAIN LANE

ROUTE 78

FOR STUDY PURPOSES ONLY

* MATCH CROSS SLOPE OF EXISTING TRAVELED WAY PAVEMENT

EXHIBIT 3
A-A
TYPICAL CROSS SECTIONS

NO SCALE

LAST REVISION 09-27-12 — DATE PLOTTED => 26-FEB-2015 — TIME PLOTTED => 09:09

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — ADV PLANNING — Caltrans

FUNCTIONAL SUPERVISOR: Chi Vargas

CALCULATED-DESIGNED BY: Ben Guerrero

CHECKED BY: Ed Kennedy

REVISED BY | DATE REVISED

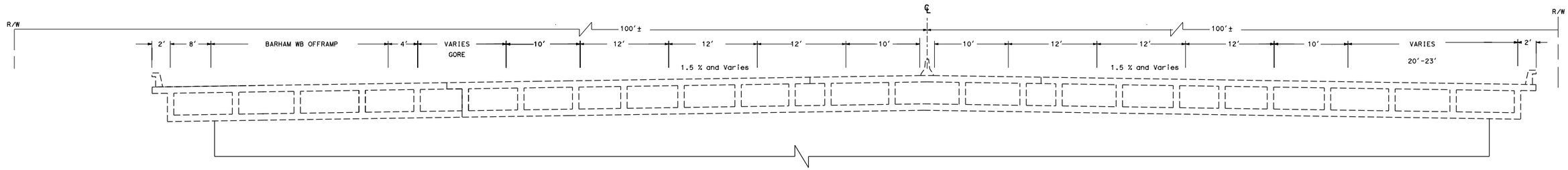
BORDER LAST REVISED 7/2/2010

USERNAME => s127584
DGN FILE => A-A_SR78_743-761.dgn

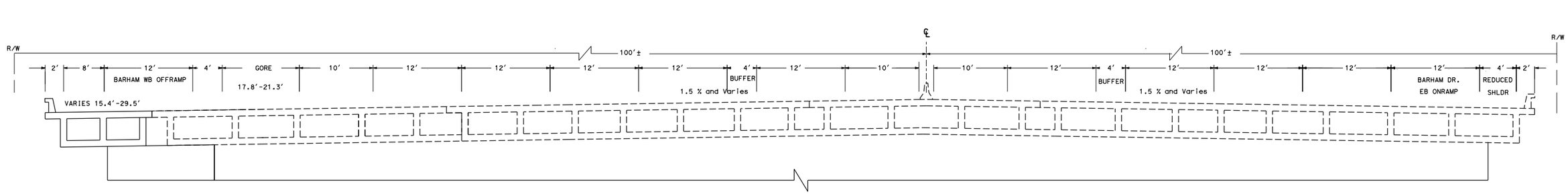
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 2759

PROJECT NUMBER & PHASE 1112000131



EXISTING CROSS SECTION



PROPOSED CROSS SECTION

LEGEND

PROPOSED

EXISTING

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

TYPICAL CROSS SECTION AT WOODLAND PARKWAY UC
IN SAN DIEGO COUNTY SR 78

FOR PRELIMINARY STUDY ONLY

SCALE: NO SCALE

CALCULATED-DESIGNED BY	CATALINO DELACRUZ	RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3	USERNAME => s127584 DGN FILE => B-B_Woodland_782-784.dgn DATE PLOTTED => 09:09 26-FEB-2015

EXHIBIT 3
B-B

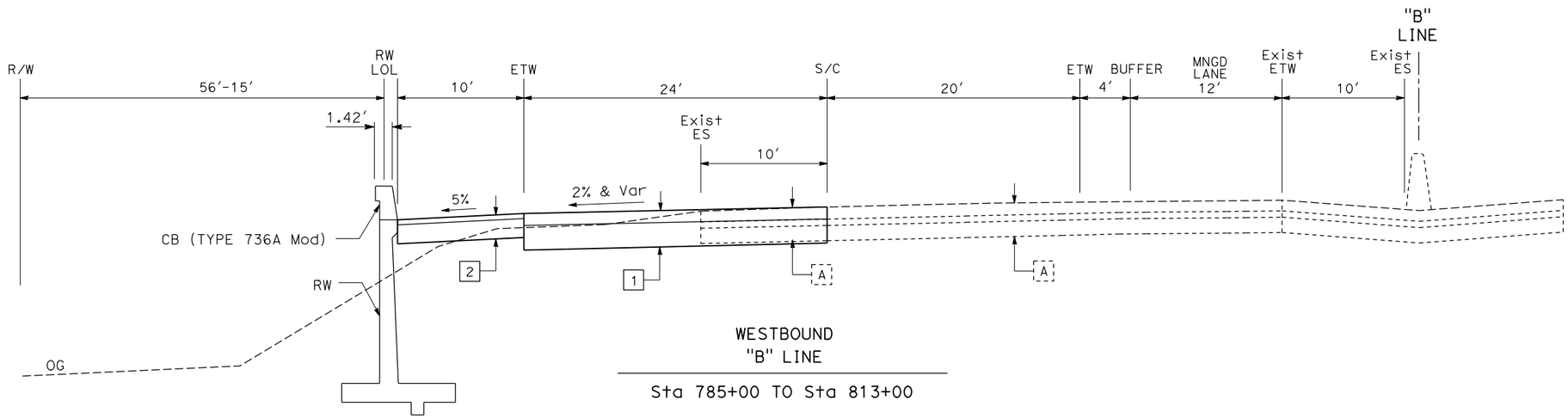
ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	78	15.5/R16.5		

REGISTERED CIVIL ENGINEER DATE

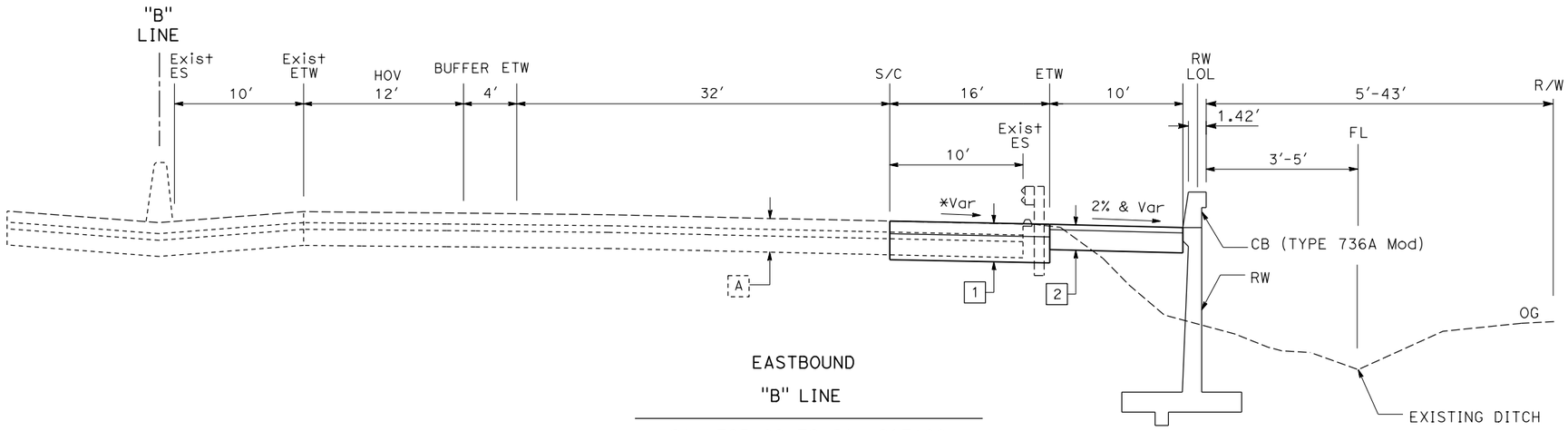
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA



WESTBOUND
"B" LINE

Sta 785+00 TO Sta 813+00



EASTBOUND
"B" LINE

Sta 785+00 TO Sta 813+00

MAIN LANE
ROUTE 78

FOR STUDY PURPOSES ONLY

* MATCH CROSS SLOPE OF EXISTING TRAVELED WAY PAVEMENT

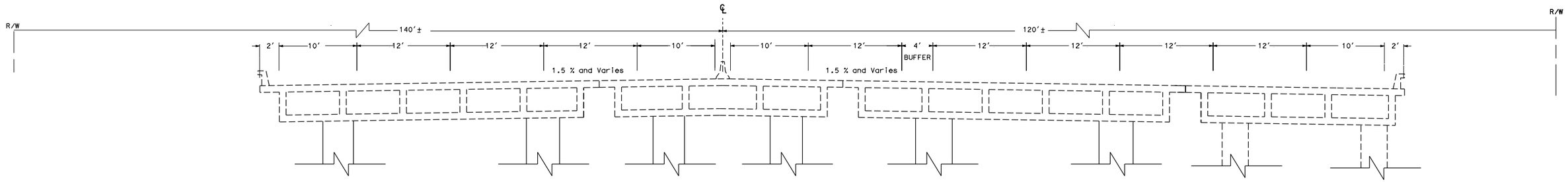
EXHIBIT 3
C-C
TYPICAL CROSS SECTIONS

NO SCALE

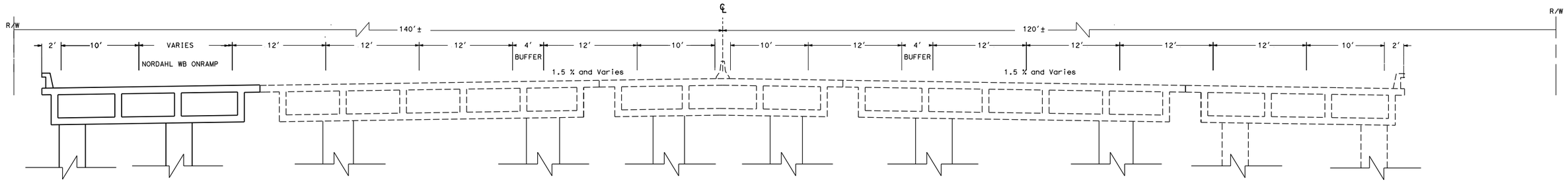
LAST REVISION 09-27-12 | DATE PLOTTED => 26-FEB-2015 | TIME PLOTTED => 09:09

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ADV PLANNING

FUNCTIONAL SUPERVISOR: Chi Vargas
CALCULATED-DESIGNED BY: Ben Guerrero
CHECKED BY: Ed Kennedy
REVISED BY | DATE REVISED



EXISTING CROSS SECTION



PROPOSED CROSS SECTION

LEGEND

———	PROPOSED
- - - - - -	EXISTING

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

TYPICAL CROSS SECTION AT MISSION ROAD OH
IN SAN DIEGO COUNTY SR 78

FOR PRELIMINARY STUDY ONLY

SCALE: NO SCALE

CALCULATED-DESIGNED BY	CATALINO DELACRUZ	RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3	USERNAME => s127584 DGN FILE => D-D_Mission_822-826.dgn DATE PLOTTED => 09:09 26-FEB-2015

EXHIBIT 3

D-D

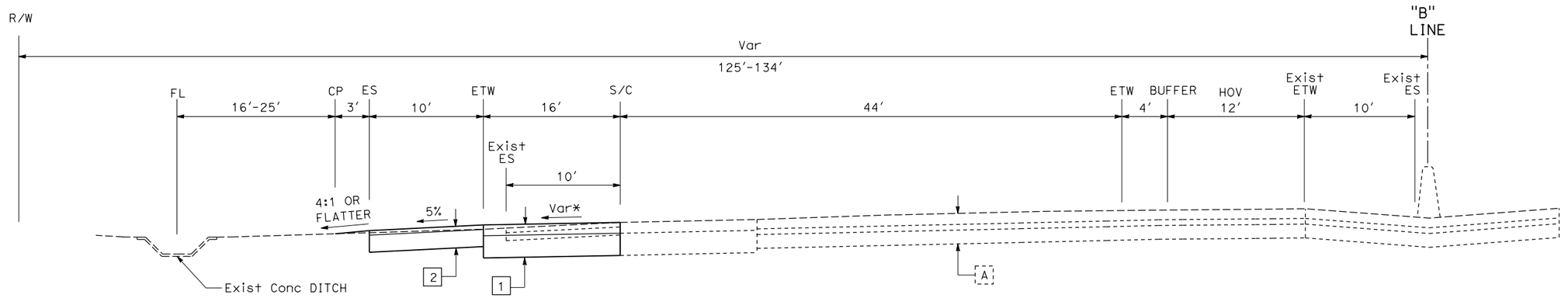
ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	78	15.5/R16.5		

REGISTERED CIVIL ENGINEER DATE

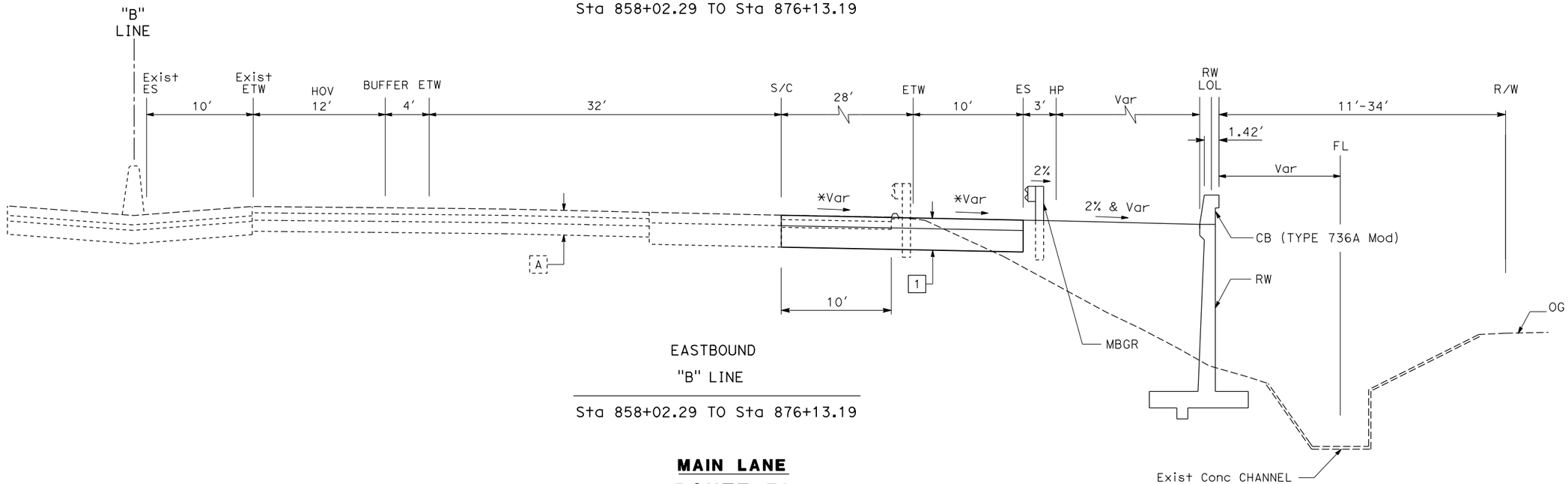
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA



WESTBOUND
"B" LINE

Sta 858+02.29 TO Sta 876+13.19



EASTBOUND
"B" LINE

Sta 858+02.29 TO Sta 876+13.19

MAIN LANE
ROUTE 78

* MATCH CROSS SLOPE OF EXISTING TRAVELED WAY PAVEMENT

FOR STUDY PURPOSES ONLY

EXHIBIT 3
E-E
TYPICAL CROSS SECTIONS

NO SCALE

CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
Ben Guerrero	Ed Kennedy		

FUNCTIONAL SUPERVISOR: Chi Vargas

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ADV PLANNING

LAST REVISION 09-27-12
DATE PLOTTED => 26-FEB-2015
TIME PLOTTED => 09:09

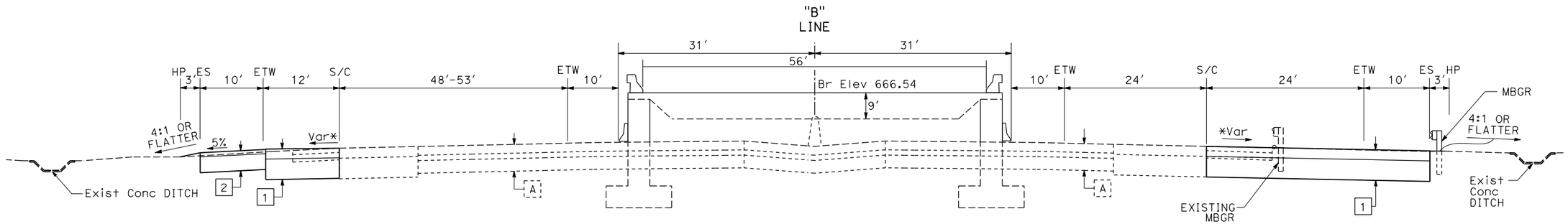
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	78	15.5/R16.5		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



EASTBOUND

"B" LINE

Sta 881+00 TO Sta 883+20

MAIN LANE

ROUTE 78

* MATCH CROSS SLOPE OF EXISTING TRAVELED WAY PAVEMENT

FOR STUDY PURPOSES ONLY

EXHIBIT 3
F-F
TYPICAL CROSS SECTIONS

NO SCALE

CALCULATED-DESIGNED BY	Ben Guerrero
CHECKED BY	Ed Kennedy
REVISED BY	
DATE REVISED	
FUNCTIONAL SUPERVISOR	Chi Vargas

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® ADV PLANNING

LAST REVISION 09-27-12 | DATE PLOTTED => 26-FEB-2015 | TIME PLOTTED => 09:09

BORDER LAST REVISED 7/2/2010 | USERNAME => s127584 | DGN FILE => F-F_SR78_881-883.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 2759 | PROJECT NUMBER & PHASE 1112000131

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	15	PM 30.97		

REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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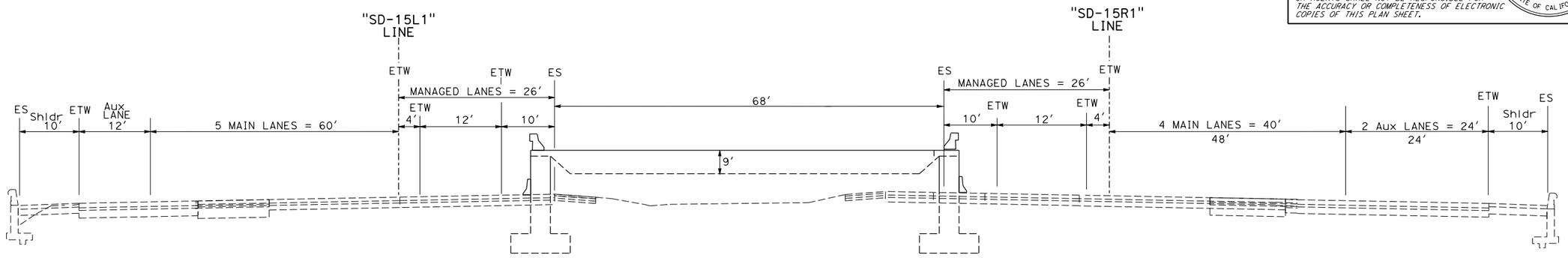
NOTE:
MSE= Mechanically Stabilized Earth

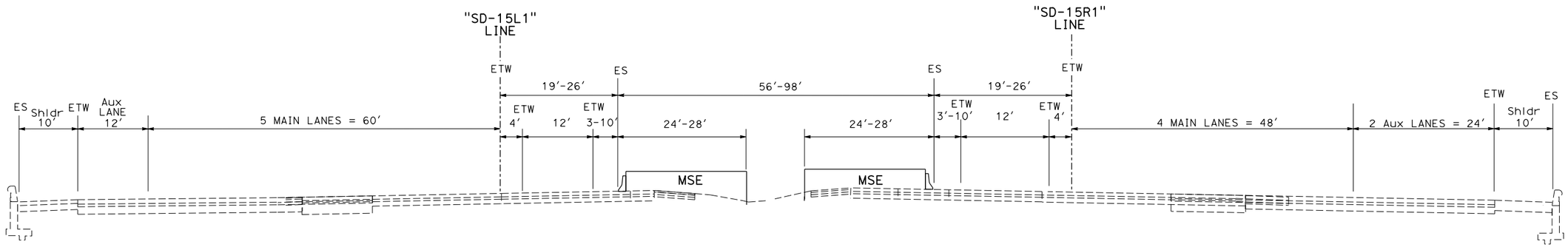


SOUTHBOUND "SD-15L1" LINE
1677+00

NORTHBOUND "SD-15R1" LINE
1677+00

H-H

PM 30.97 - 31.2
ROUTE 15 HOV CONNECTOR RAMP



SOUTHBOUND "SD-15L1" LINE
1672+00 - 1676+00

NORTHBOUND "SD-15R1" LINE
1672+00 - 1676+00

G-G

FOR STUDY PURPOSES ONLY

EXHIBIT 3
G-G & H-H
TYPICAL CROSS SECTION
NO SCALE

CALCULATED-DESIGNED BY	REVISED BY	DATE REVISED
CHECKED BY	Ben Guerrero	Edmund Kennedy

FUNCTIONAL SUPERVISOR: CHI VARGAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION 08-22-12 DATE PLOTTED => 26-FEB-2015 TIME PLOTTED => 09:09

BORDER LAST REVISED 3/1/2007 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s127584 DGN FILE => G-G_I-15_1672-1677_2.dgn | CU 2759 | EA 2T240K

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:16 26-FEB-2015

EXHIBIT 4
1 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:16 26-FEB-2015

EXHIBIT 4
2 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

VALPREDA RD

RANCHEROS DR

RET WALL #7

RET WALL #8

R/W

R/W

E CARMEL ST

CALIFORNIA 78

10'
12'
12'
12'
12'
12'
14'
Var
12'
12'
12'
12'
Var

735

740

745

LEGEND

Alternative 1 and 2

Lane Configuration

Road Work

PHOTO DATE: 12/11/2012

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:16 26-FEB-2015

EXHIBIT 4
3 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

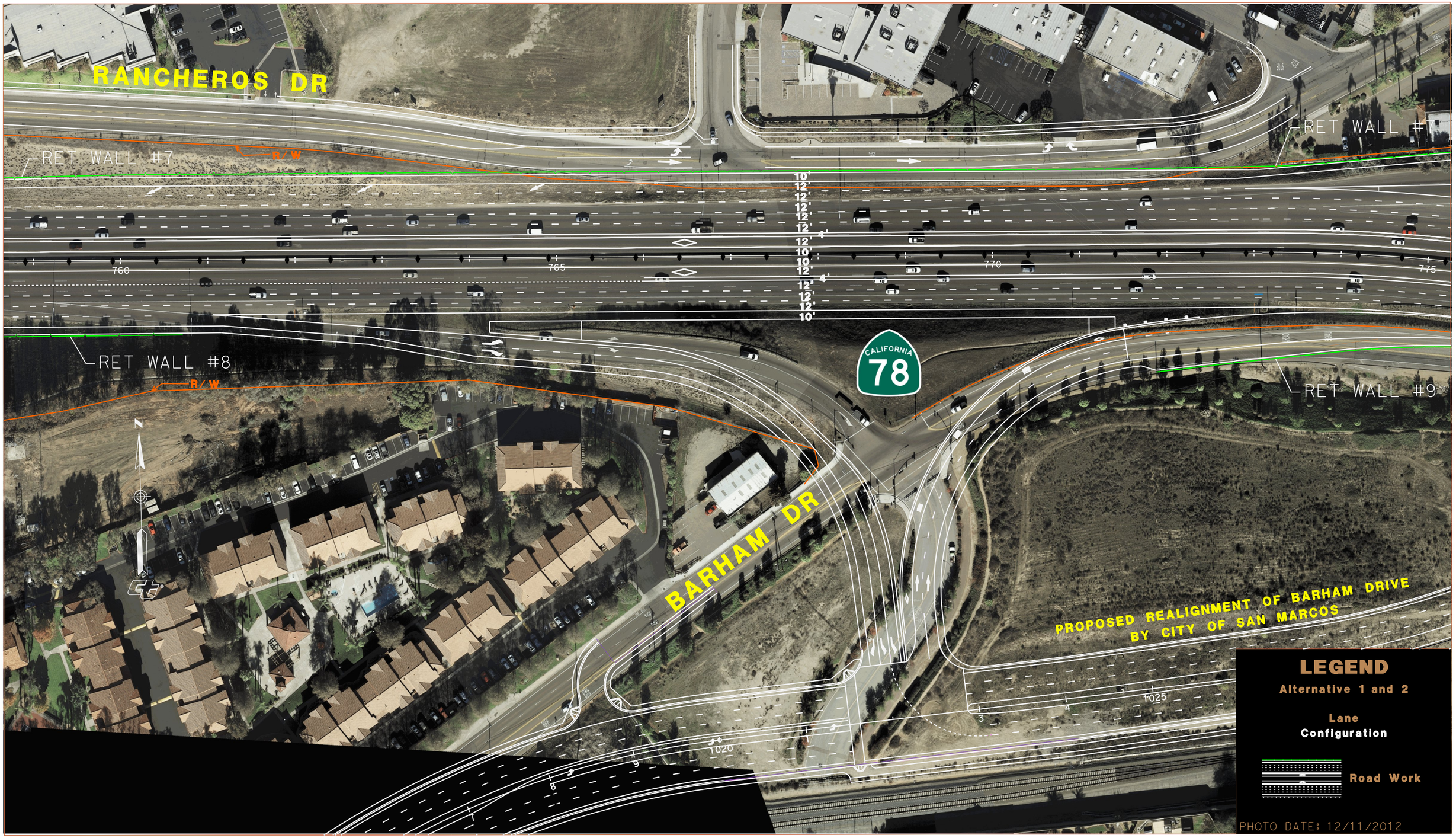
FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:16 26-FEB-2015

EXHIBIT 4
4 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

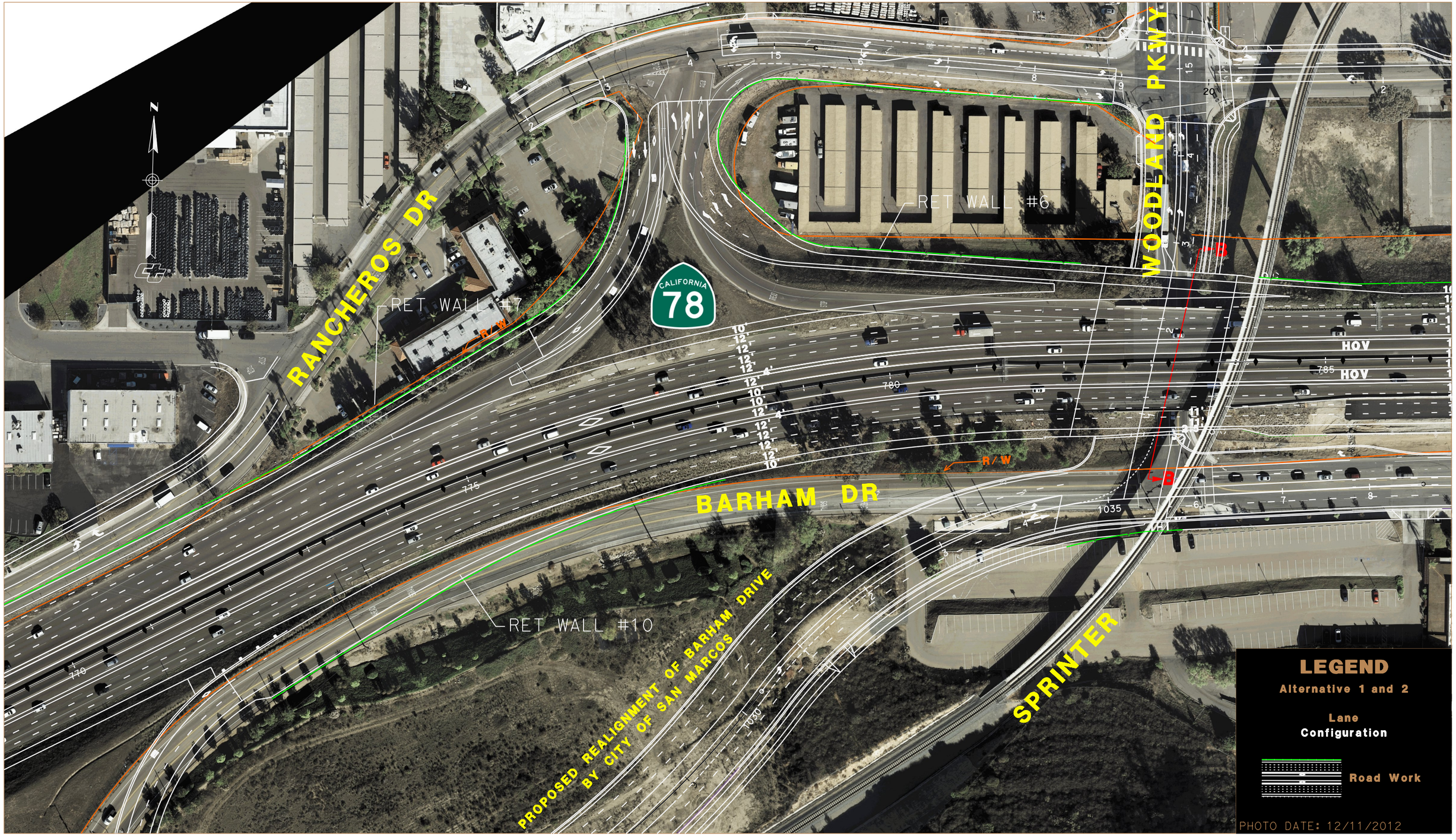
FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:17 26-FEB-2015

EXHIBIT 4
5 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:17 26-FEB-2015

EXHIBIT 4
6 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:17 26-FEB-2015

EXHIBIT 4
7 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:17 26-FEB-2015

EXHIBIT 4
8 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:17 26-FEB-2015

EXHIBIT 4
9 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:17 26-FEB-2015

EXHIBIT 4
10 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

10 19 FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:18 26-FEB-2015

EXHIBIT 4
11 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:18 26-FEB-2015

EXHIBIT 4
12 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:18 26-FEB-2015

EXHIBIT 4
13 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:18 26-FEB-2015

EXHIBIT 4
14 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

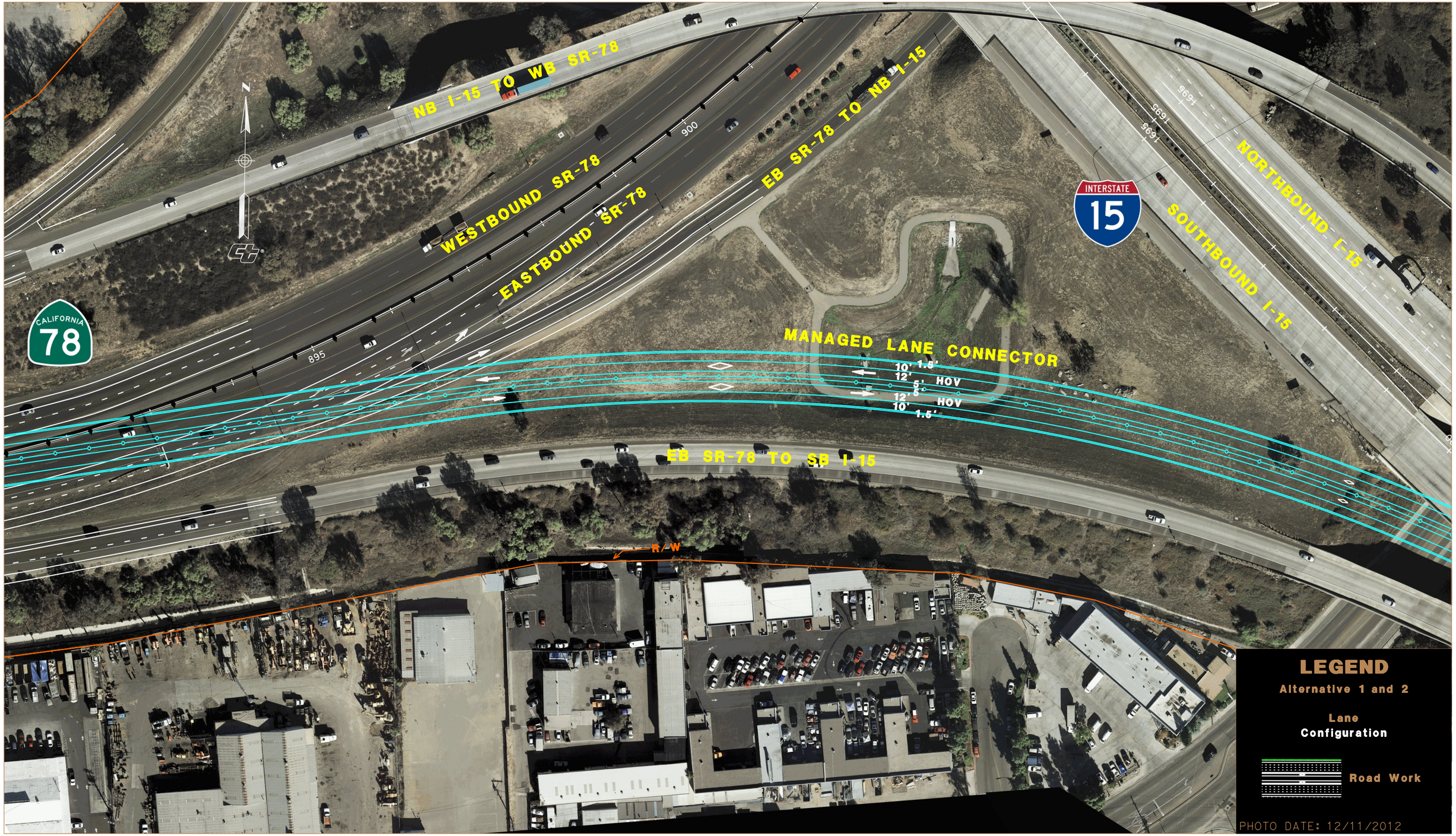
FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:18 26-FEB-2015

EXHIBIT 4
15 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

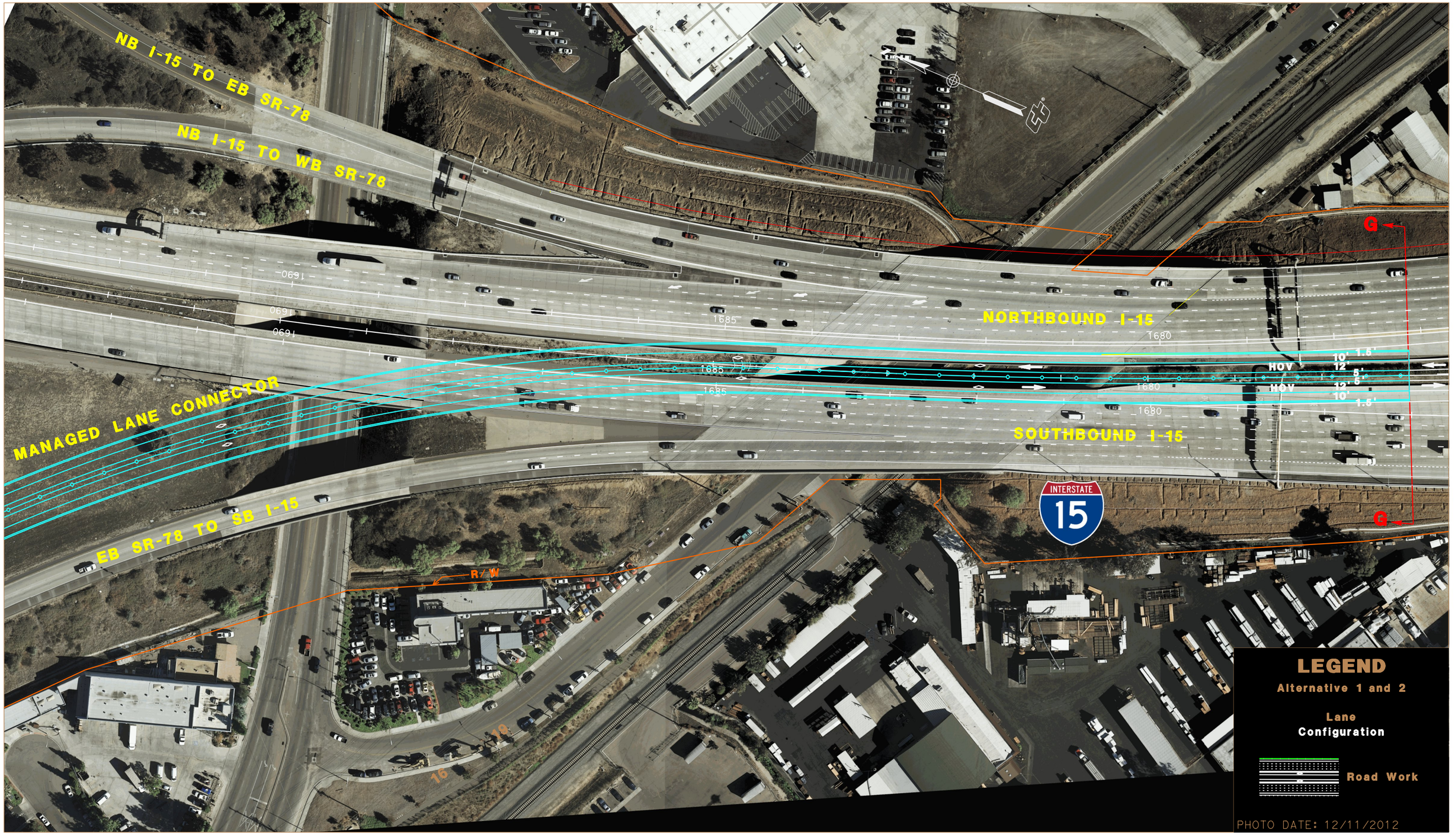
FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:18 26-FEB-2015

EXHIBIT 4
16 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

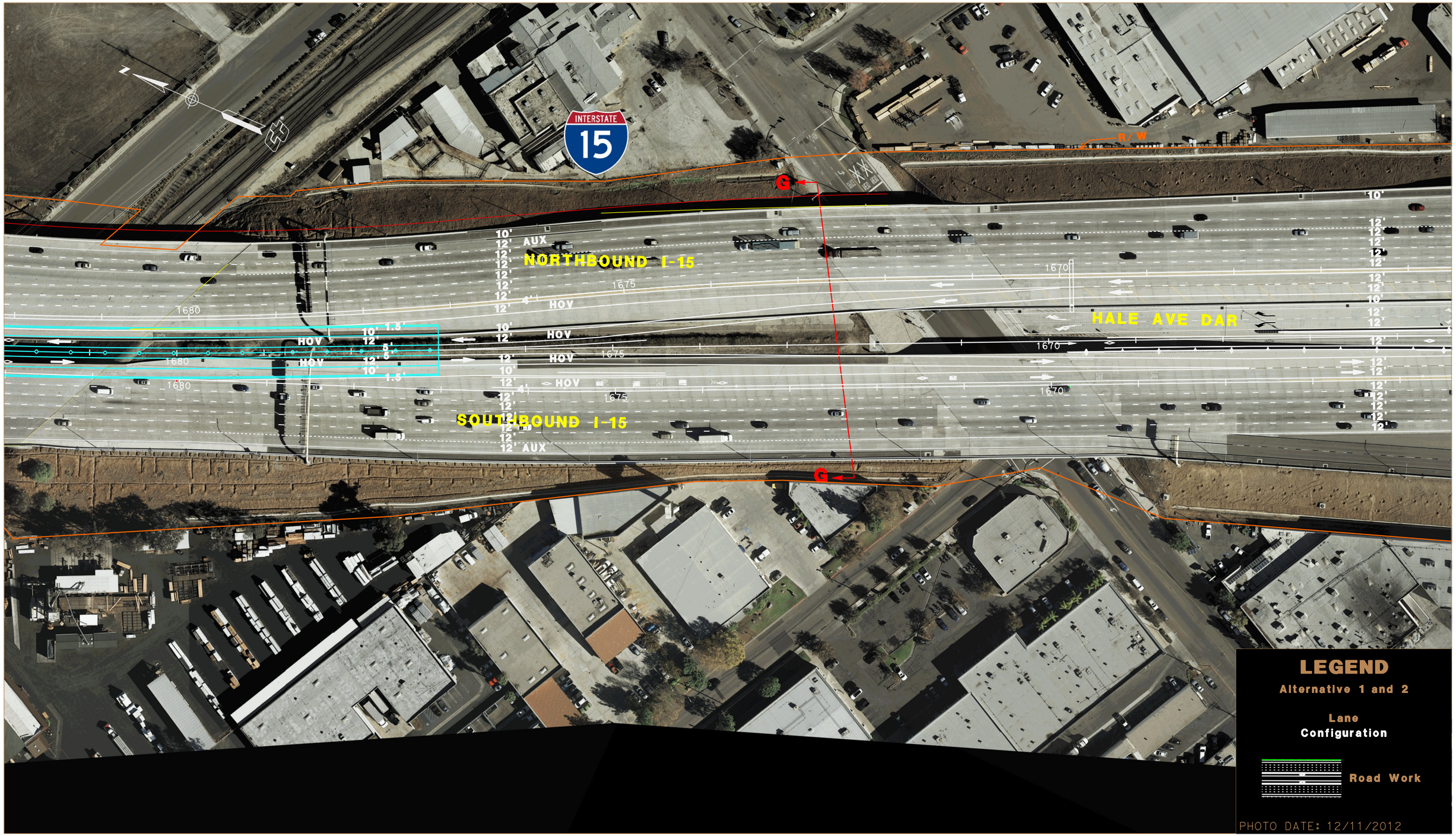
FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:19 26-FEB-2015

EXHIBIT 4
17 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

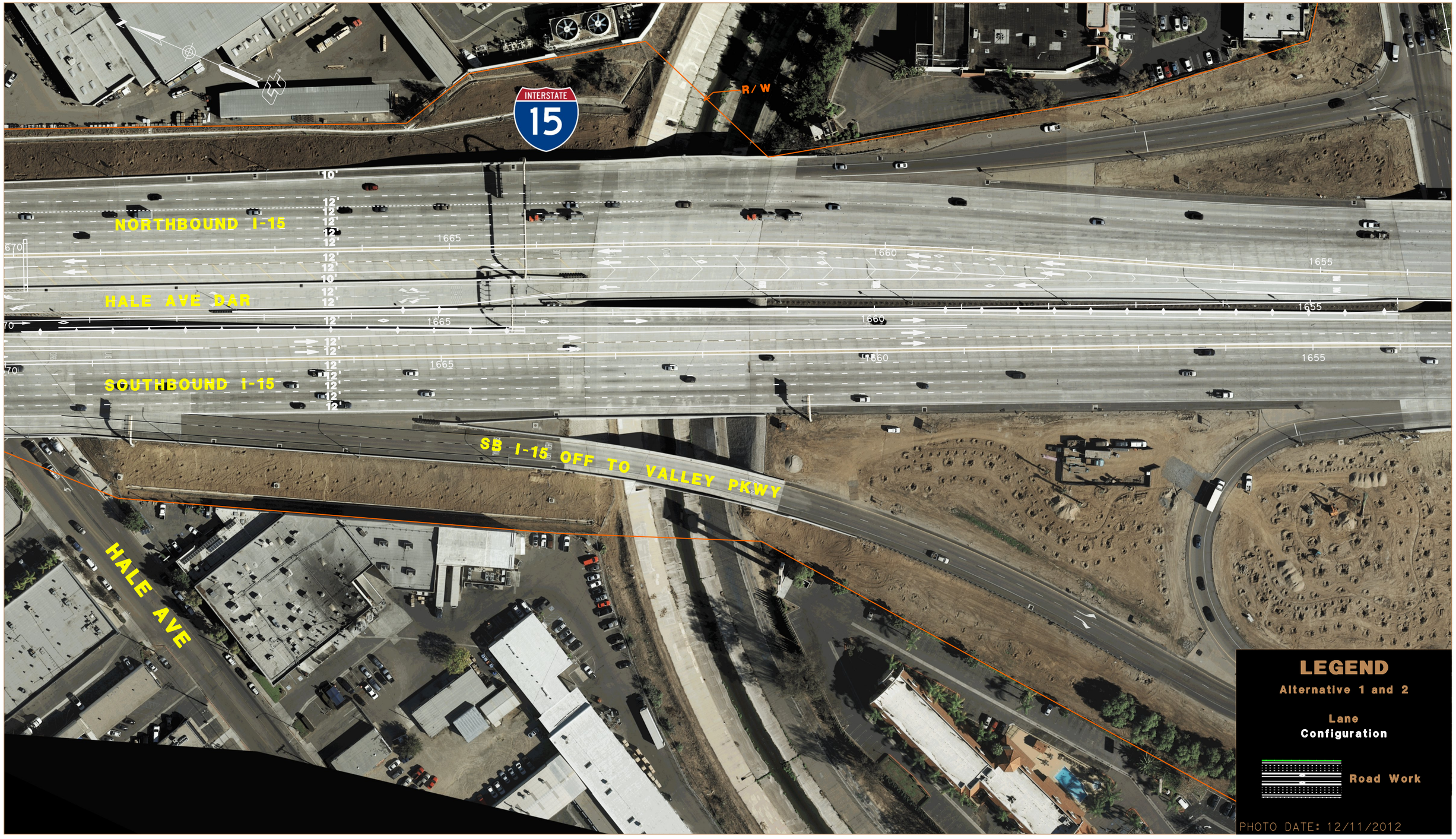
FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

DATE PLOTTED => 09:19 26-FEB-2015

EXHIBIT 4
18 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11
OFFICE OF
ADVANCED PLANNING

HOV CONNECTOR PROJECT ON ROUTES 15 & 78

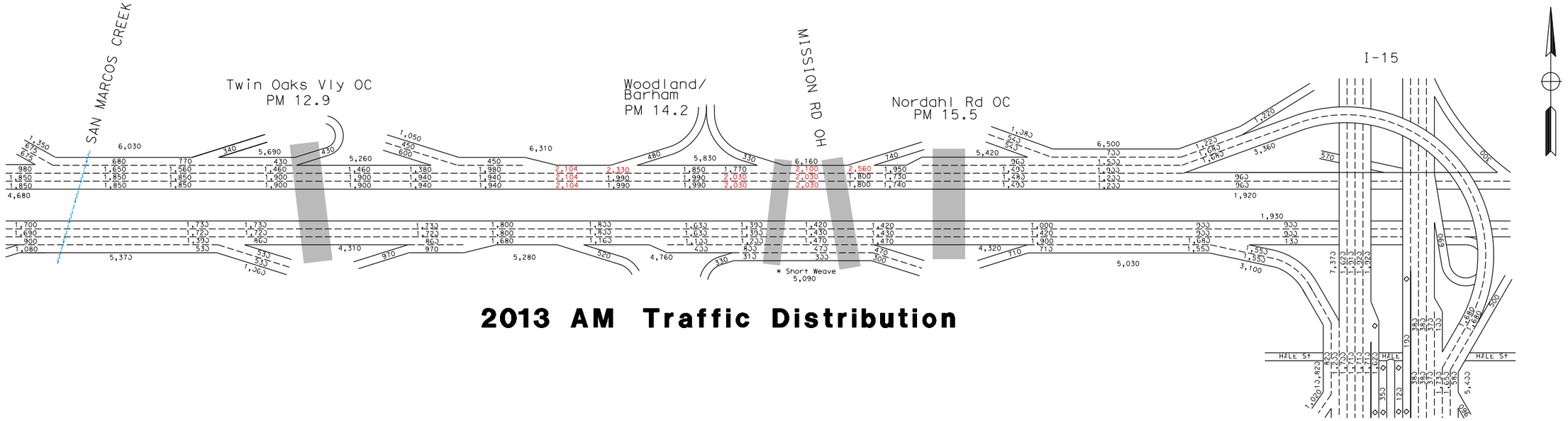
FOR PRELIMINARY STUDY ONLY

SCALE: 1:100

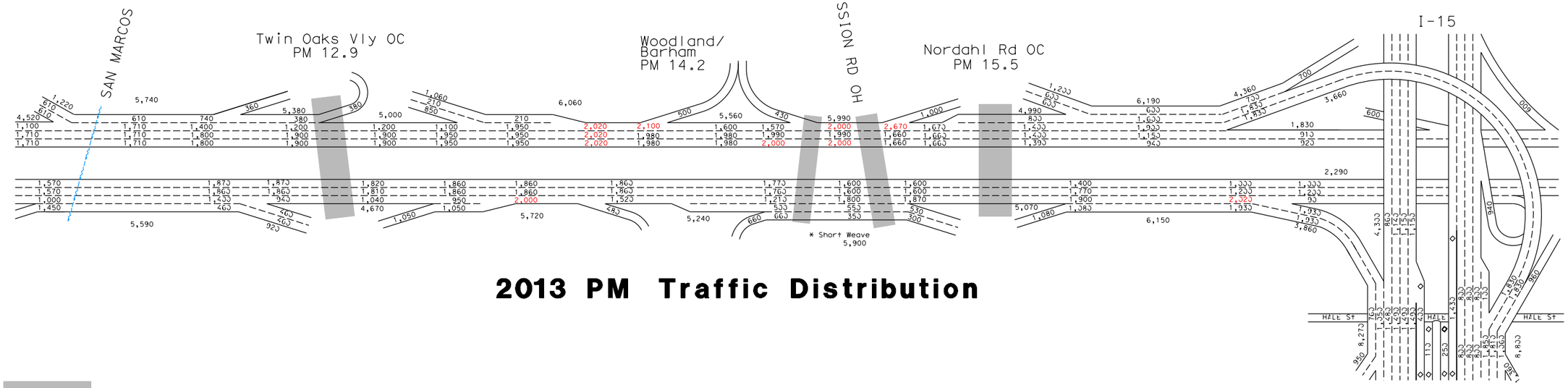
DATE PLOTTED => 09:19 26-FEB-2015

EXHIBIT 4
19 OF 19

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



2013 AM Traffic Distribution



2013 PM Traffic Distribution

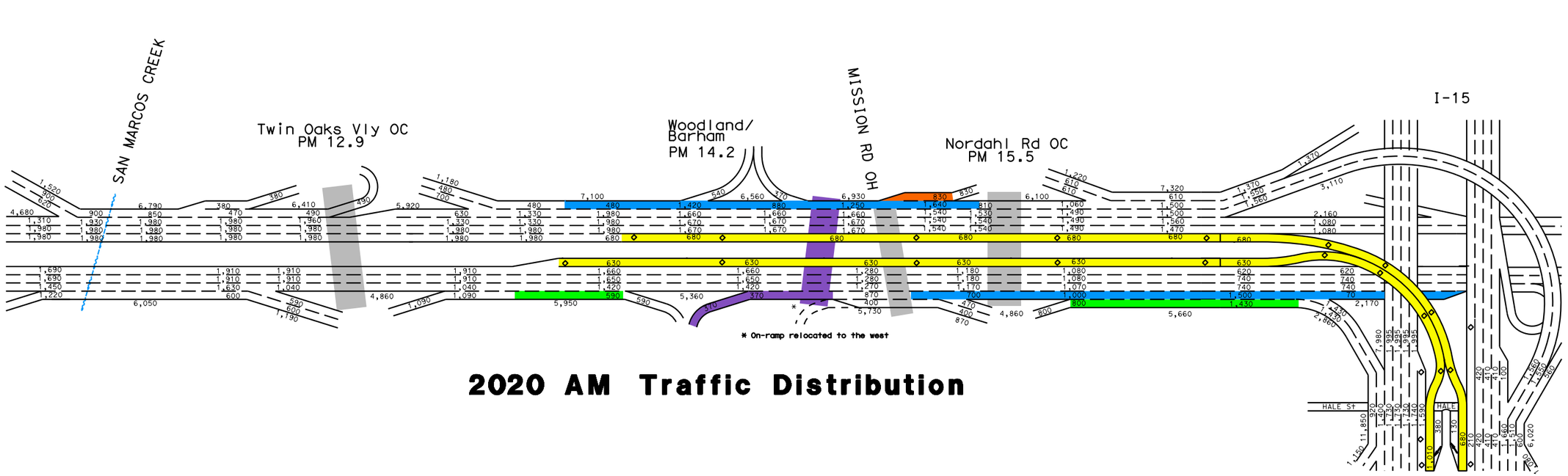
Existing Structure

CT D11 Advance Planning **Sept 2013**

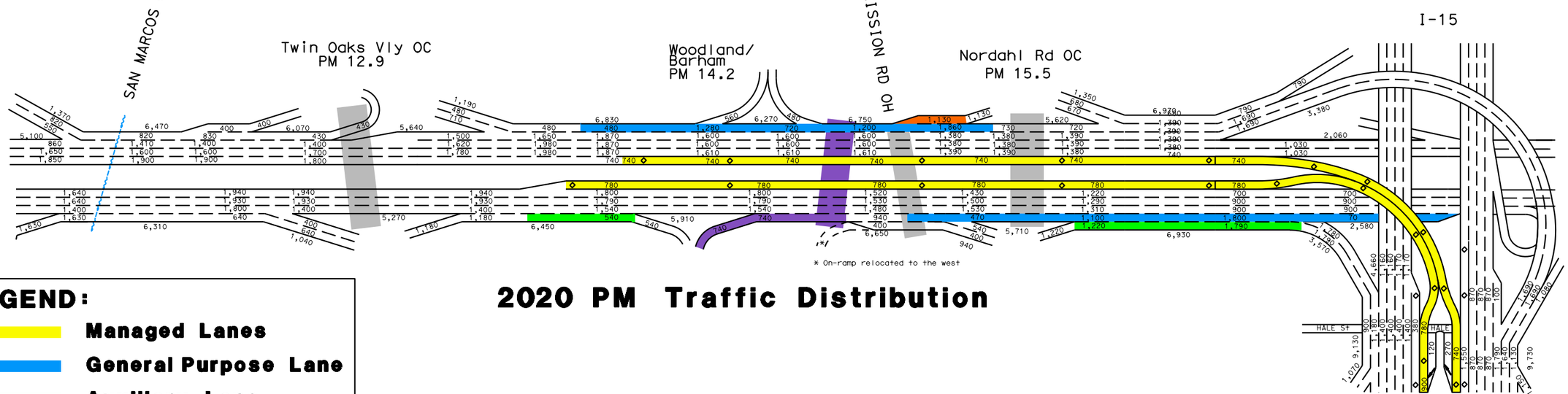
SR-78 Existing YR 2013 Traffic Volumes

EXHIBIT 5

NO SCALE **Sheet 1 of 3**



2020 AM Traffic Distribution



2020 PM Traffic Distribution

LEGEND:

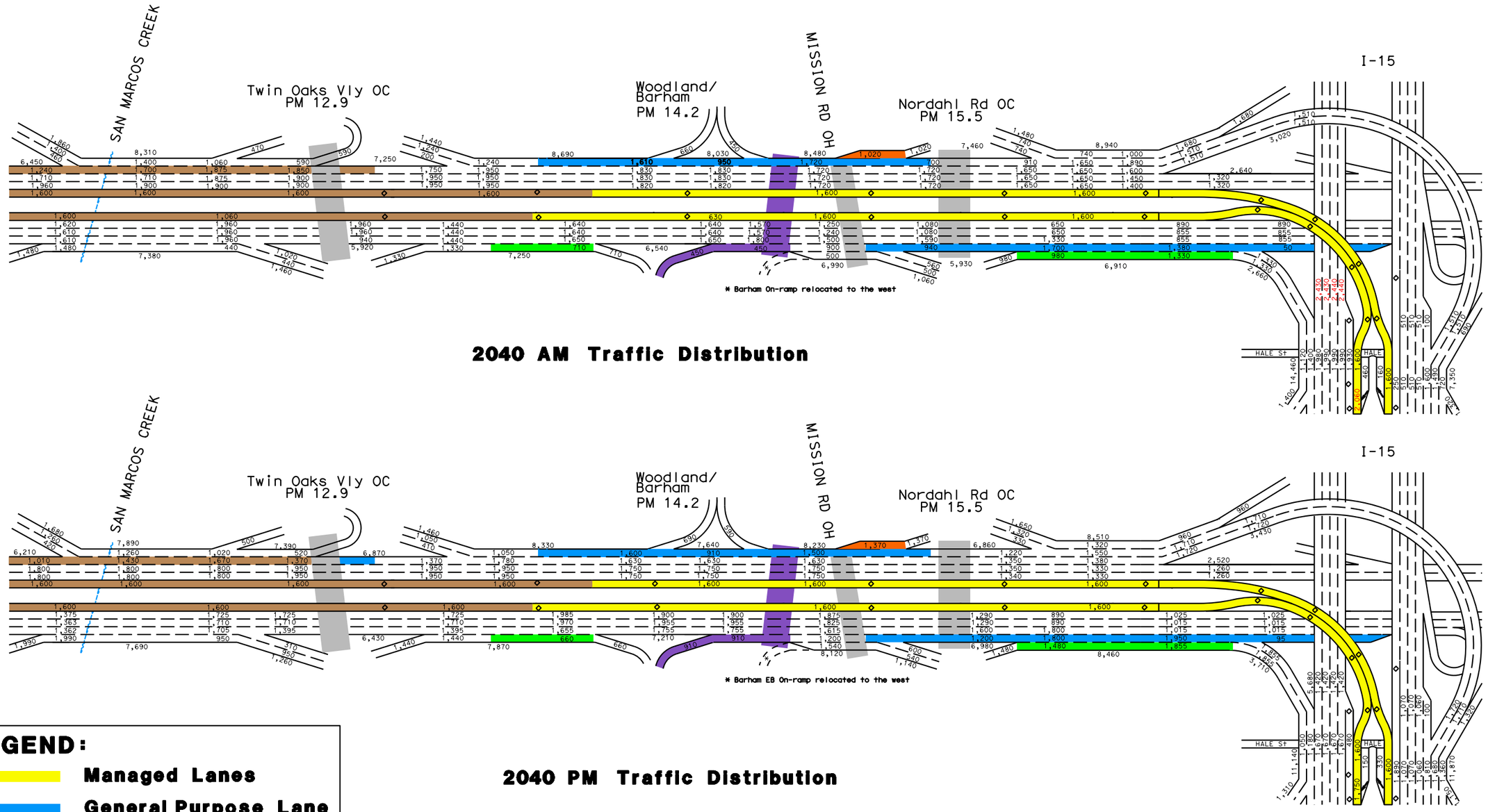
- Managed Lanes
- General Purpose Lane
- Auxiliary Lane
- Accel/Decel Lane
- Prop City Project
- Existing Structure

Revised November 2014

SR-78 Build YR 2020 Traffic Volumes

Exhibit 5

No Scale **Sheet 2 of 3**



2040 AM Traffic Distribution

2040 PM Traffic Distribution

LEGEND:

- Managed Lanes
- General Purpose Lane
- Auxiliary Lane
- Accel/Decel Lane
- Prop City Project
- Future CT Project
- Existing Structure

Revised November 2014

SR-78 Horizon YR 2040 Traffic Volumes

Exhibit 5

No Scale **Sheet 3 of 3**

Figure 1
Westbound SR-78 Speed Comparison
YRs 2010 and 2013

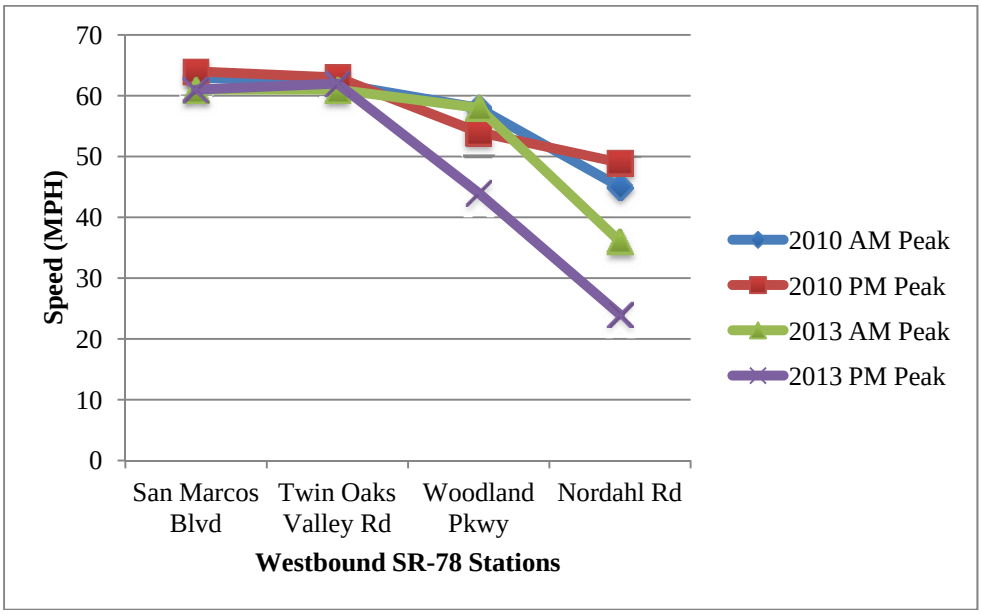


Figure 2
Eastbound SR-78 Speed Comparison
YRs 2010 and 2013

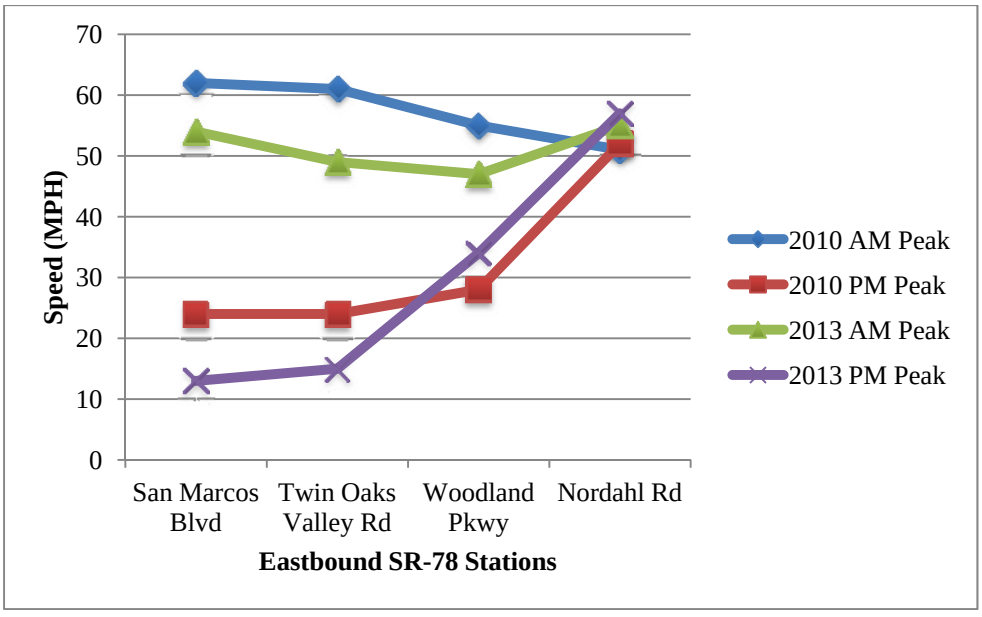


Exhibit 6
SR-78 Existing Speed Graphs

11- PAGE ESTIMATE

EA 11-2T240K PID 1112000131

Type of Estimate : Project Study Report/ Project Development Support
Program Code : HB5
Project Limits : PM R30.6 - R32.0/PM R12.6 - R16.7
Description: **In San Diego County in and near Escondido and San Marcos On Route 15 From 0.4 Mile South of Hale Avenue Undercrossing to 0.5 Mile North of the Route 15/78 Separation and On Route 78 from 0.3 Mile West of Twin Oaks Valley Road Overcrossing to 0.2 Mile West of the Rock Springs Road**
Scope : Build HOV connector, one lane in ea direction, widen SR78
Alternative : Alternative 1 or Alternative 2

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 142,799,100.00	$ 185,880,365.00
STRUCTURE ITEMS	$ 48,041,000.00	$ 62,534,558.00
SUBTOTAL CONSTRUCTION COST	$ 190,840,100.00	$ 248,414,923.00
RIGHT OF WAY	$ 17,335,590.00	$ 22,027,000.00
TOTAL CAPITAL COST	**$ 208,176,000.00**	**$ 270,442,000.00**
PA/ED SUPPORT		$ 6,963,400.00
PS&E SUPPORT		$ 16,500,000.00
RIGHT OF WAY SUPPORT		$ 141,100.00
CONSTRUCTION SUPPORT		$ 23,500,000.00
TOTAL SUPPORT COST		**$ 47,104,400.00**
TOTAL PROJECT COST	**$ 209,000,000.00**	**$ 318,000,000.00**

	month	year
Date (Month/Year) of Estimate	3	/ 2015
Estimated Date (Month/Year) of Construction	2	/ 2024
Number of Months of Escalation	107	
Number of Years of Escalation	8.92	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	260	
Number of Plant Establishment Days	750	

Estimated Project Schedule

PID Approval	March-15
PA/ED Approval	July-20
PS&E	June-23
RTL	October-23
Begin Construction	February-24

Reviewed by District 0.E. Leon G. Edmonds 3/23/15 (619) 688-6735
Leon G. Edmonds District 11 Office Engineer **Date** **Phone**

Approved by Project Manager Karen M. Jewel 3/23/15 (619) 688-6803
Karen Jewel, Project Manager **Date** **Phone**

Escalation rates used in this estimate for Highway Construction Capital Costs are 3.0% compounded annually to Construction year. The decision to use 3.0% for this estimate was as per the Office of Office Engineer. (REV03/12/14)

I. ROADWAY ITEMS

Section			Cost
1	**Earthwork**		$ 13,543,100
2	**Structural Section**		$ 11,547,000
3	**Drainage**		$ 4,995,500
4	**Specialty Items**		$ 20,733,400
5	**Environmental**		$ 20,082,900
	5A Environmental Mitigation	$ 15,008,000	
	5B Landscape and Irrigation	$ 2,464,000	
	5C Erosion Control	$ 686,128	
	5D NPDES	$ 1,924,750	
6	**Traffic Items**		$ 10,219,700
	6A Electrical	$ 8,175,000	
	6B Signing and Striping	$ 1,129,454	
	6C Traffic Management Plan	$ 20,000	
	6D Traffic Control	$ 895,200	
7	**Detours**		$ 112,000
8	**Minor Items**		$ 8,123,400
9	**Roadway Mobilization**		$ 8,935,700
10	**Supplemental Work**		$ 5,418,300
11	**State Furnished**		$ 849,900
12	**Contingencies**		$ 31,368,300
13	**Overhead**		$ 6,869,900

TOTAL ROADWAY ITEMS **$ 142,799,100**

Estimate Prepared By : Rachel Mueller 3/20/15 688-3679
Rachel Mueller, Project Engineer — Date — Phone

Estimate Reviewed By : Victor V Cardenas 3/20/15 688-3670
Victor Cardenas, Design Manager — Date — Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1 EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY	562,000	x	10.00	=	$	5,620,000
190103	Roadway Excavation (Type Y) ADL	CY	94,000	x	20.00	=	$	1,880,000
194001	Ditch Excavation	CY	11,900	x	10.00	=	$	119,000
198010	Imported Borrow	CY/TON	761	x	25.00	=	$	19,025
192037	Structure Excavation (Retaining Wall)	CY	29,500	x	20.00	=	$	590,000
193013	Structure Backfill (Retaining Wall)	CY	29,000	x	40.00	=	$	1,160,000
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$	-
160102	Clearing & Grubbing	ACRE	16	x	5,000.00	=	$	80,000
170101	Develop Water Supply	LS	1	x	50,000.00	=	$	50,000
198010	Imported Borrow	CY	380,000	x	10.00	=	$	3,800,000
210130	Duff	ACRE		x		=	$	-
180106	Dust Palliatives	LS	1	x	225,000.00	=	$	225,000

TOTAL EARTHWORK SECTION ITEMS $ 13,543,100

Section 2 STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401050	Jointed Plain Concrete Pavement	CY		x		=	$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404093	Seal Isolation Joint	LF		x		=	$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		=	$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		=	$	-
280010	Rapid Strength Concrete Base	CY		x		=	$	-
410095	Dowel Bar (Drill and Bond)	EA		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON	95,000	x	80.00	=	$	7,600,000
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON		x		=	$	-
39300X	Geosynthetic Pavement Interlayer (Type X)	SQYD		x		=	$	-
26020X	Class 2 Aggregate Base	TON/CY	107,000	x	28.00	=	$	2,996,000
290201	Asphalt Treated Permeable Base	CY		x		=	$	-
250401	Class 4 Aggregate Subbase	CY		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON	30	x	700.00	=	$	21,000
397005	Tack Coat	TON	85	x	1,200.00	=	$	102,000
377501	Slurry Seal	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
370001	Sand Cover (Seal)	TON		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT	11,000	x	15.00	=	$	165,000
731502	Minor Concrete (Miscellaneous Construction)	CY		x		=	$	-
39407X	Place Hot Mix Asphalt Dike (Type D)	LF	51,000	x	1.00	=	$	51,000
150771	Remove Asphalt Concrete Dike	LF	41,000	x	1.00	=	$	41,000
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
150860	Remove Base and Surfacing	CY	33,100	x	10.00	=	$	331,000
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
153122	Remove Concrete	LS	1	x	150,000.00	=	$	150,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD		x		=	$	-
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		=	$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD	3,000	x	30.00	=	$	90,000

TOTAL STRUCTURAL SECTION ITEMS $ 11,547,000

SECTION 3 DRAINAGE

Item code		Unit	Quantity		Price		Amount
15080X	Remove Culvert	EA/LF	1,500	x	50.00	=	$ 75,000
150820	Modify Inlet	EA	110	x	2,000.00	=	$ 220,000
155232	Sand Backfill	CY		x		=	$ -
15020X	Abandon Culvert	EA/LF		x		=	$ -
152430	Adjust Inlet	LF		x		=	$ -
155003	Cap Inlet	EA		x		=	$ -
510501	Minor Concrete	CY	75	x	2,000.00	=	$ 150,000
510502	Minor Concrete (Minor Structure)	CY	300	x	2,000.00	=	$ 600,000
5105XX	Minor Concrete (Type XX)	CY		x		=	$ -
620XXX	XX" Alternative Pipe Culvert (Type X)	LF		x		=	$ -
6411XX	XX" Plastic Pipe	LF		x		=	$ -
650014	18" Reinforced Concrete Pipe (Type X)	LF	1,000	x	150.00	=	$ 150,000
650018	24" Reinforced Concrete Pipe (Type X)	LF	5,000	x	150.00	=	$ 750,000
650022	30" Reinforced Concrete Pipe (Type X)	LF	50	x	200.00	=	$ 10,000
650026	36" Reinforced Concrete Pipe (Type X)	LF	50	x	600.00	=	$ 30,000
650034	48" Reinforced Concrete Pipe (Type X)	LF		x		=	$ -
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF		x		=	$ -
68XXXX	XX" Plastic Pipe (Edge Drain)	LF		x		=	$ -
69011X	XX" Corrugated Steel Pipe Downdrain (0.XXX" Thick	LF		x		=	$ -
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF		x		=	$ -
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thicl	LF		x		=	$ -
7050XX	XX" Steel Flared End Section	EA		x		=	$ -
703233	Grated Line Drain	LF		x		=	$ -
72XXXX	Rock Slope Protection (Type and Method)	CY/TON	50	x	200.00	=	$ 10,000
72901X	Rock Slope Protection Fabric (Class X)	SQYD	100	x	10.00	=	$ 1,000
721420	Concrete (Ditch Lining)	CY	1,000	x	500.00	=	$ 500,000
721430	Concrete (Channel Lining)	CY	609	x	500.00	=	$ 304,500
750001	Miscellaneous Iron and Steel	LB	65,000	x	3.00	=	$ 195,000
XXXXXX	Additional Drainage	LS	1	x	2,000,000.00	=	$ 2,000,000

TOTAL DRAINAGE ITEMS $ 4,995,500

SECTION 4 SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)		Cost
080050	Progress Schedule (Critical Path Method)	LS	1	x	60,000.00	=	$ 60,000
582001	Sound Wall (Masonry Block)	SQFT	106,200	x	15.00	=	$ 1,593,000
510530	Minor Concrete (Wall)	CY		x		=	$ -
15325X	Remove Sound Wall	LF/LS		x		=	$ -
070300	Lead Compliance Plan	LS	1	x	30,000.00	=	$ 30,000
141120	Treated Wood Waste	LB	198,550	x	0.15	=	$ 29,783
153221	Remove Concrete Barrier	LF		x		=	$ -
150662	Remove Metal Beam Guard Railing	LF	5,000	x	10.00	=	$ 50,000
150668	Remove Flared End Section	EA		x		=	$ -
8000XX	Chain Link Fence (Type XX)	LF		x		=	$ -
80XXXX	XX" Chain Link Gate (Type CL-6)	EA		x		=	$ -
832001	Metal Beam Guard Railing	LF	6,650	x	25.00	=	$ 166,250
839301	Single Thrie Beam Barrier	LF		x		=	$ -
839310	Double Thrie Beam Barrier	LF		x		=	$ -
839521	Cable Railing	LF	6,000	x	15.00	=	$ 90,000
8395XX	Terminal System (Type CAT)	EA		x		=	$ -
839585	Alternative Flared Terminal System	EA	4	x	3,000.00	=	$ 12,000
839584	Alternative In-line Terminal System	EA	3	x	3,500.00	=	$ 10,500
4906XX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$ -
839604	Crash Cushion *(React 9CBB)*	EA	2	x	60,000.00	=	$ 120,000
839701	Concrete Barrier *(Type 60)*	LF	500	x	110.00	=	$ 55,000
839726	Concrete Barrier *(Type 736A)*	LF	17,200	x	60.00	=	$ 1,032,000
520103	Bar Reinforced Steel (Retaining Wall)	LB	1,715,000	x	0.85	=	$ 1,457,750
510060	Structural Concrete, Retaining Wall	CY	12,000	x	400.00	=	$ 4,800,000
513553	Retaining Wall (Masonry Wall)	SQFT		x		=	$ -
511035A	Architectural Treatment (Sound Wall)	SQFT	106,200	x	15.00	=	$ 1,593,000
511035B	Architectural Treatment (Retaining Wall)	SQFT	200,000	x	24.00	=	$ 4,800,000
511035C	Architectural Treatment (Bridge)	LS	1	x	4,811,300.00	=	$ 4,811,300
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT		x		=	$ -
83954X	Transition Railing (Type WB)	EA	6	x	3,800.00	=	$ 22,800
597601	Prepare and Stain Concrete	SQFT		x		=	$ -
839561	Rail Tensioning Assembly	EA		x		=	$ -
83958X	End Anchor Assembly (Type X)	EA		x		=	$ -

TOTAL SPECIALTY ITEMS $ 20,733,400

Section 5 ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Price		Amount
	Biological Mitigation	LS	1	x	15,000,000.00	=	$ 15,000,000
141000	Temporary Fence (Type ESA)	LF	800	x	10.00	=	$ 8,000

Subtotal Environmental *$ 15,008,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Price		Amount
20XXXX	Highway Planting	LS	1	x	70,000.00	=	$ 70,000
20XXXX	Irrigation System	LS	1	x	110,000.00	=	$ 110,000
204099	Plant Establishment Work	LS		x		=	$ -
204101	Extend Plant Establishment Work	LS		x		=	$ -
20XXXX	Follow-up Landscape Project	LS	1	x	2,204,000.00	=	$ 2,204,000
150685	Remove Irrigation Facility	LS		x		=	$ -
20XXXX	Maintain Existing (Irrigation or Planted Areas)	LS		x		=	$ -
206400	Check and Test Existing Irrigation Facilities	LS		x		=	$ -
21011X	Imported Topsoil (X)	CY/TON		x		=	$ -
20XXXX	Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD		x		=	$ -
200122	Weed Germination	SQYD		x		=	$ -
208304	Water Meter	EA	2	x	40,000.00	=	$ 80,000
2087XX	XX" Conduit (Use for Irrigation x-overs)	LF		x		=	$ -
20890X	Extend X" Conduit *(Use for Extension of Irrigation x-overs)*	LF		x		=	$ -

Subtotal Landscape and Irrigation *$ 2,464,000*

5C - EROSION CONTROL

Item code		Unit	Quantity		Price		Amount
210010	Move In/Move Out (Erosion Control)	EA	4	x	800.00	=	$ 3,200
210350	Fiber Rolls	LF	19,536	x	7.00	=	$ 136,752
210360	Compost Sock	LF		x		=	$ -
2102XX	Rolled Erosion Control Product (X)	SQFT		x		=	$ -
21025X	Bonded Fiber Matrix	SQFT/ACRE	16	x	8,000.00	=	$ 128,000
210300	Hydromulch	SQFT		x		=	$ -
210420	Straw	SQFT		x		=	$ -
210430	Hydroseed	SQFT		x		=	$ -
210600	Compost	SQFT	696,960	x	0.40	=	$ 278,784
210630	Incorporate Materials	SQFT	696,960	x	0.20	=	$ 139,392

Subtotal Environmental *$ 686,128*

5D - NPDES

Item code		Unit	Quantity		Price		Amount
130300	Prepare SWPPP	LS	1	x	40,000.00	=	$ 40,000
130200	Prepare WPCP	LS		x		=	$ -
130100	Job Site Management	LS	1	x	1,200,000.00	=	$ 1,200,000
130330	Storm Water Annual Report	EA	5	x	2,000.00	=	$ 10,000
130310	Rain Event Action Plan (REAP)	EA	27	x	500.00	=	$ 13,500
130320	Storm Water Sampling and Analysis Day	EA	18	x	6,250.00	=	$ 112,500
130520	Temporary Hydraulic Mulch	SQYD	75,000	x	0.25	=	$ 18,750
130550	Temporary Hydroseed	SQYD		x		=	$ -
130505	Move-In/Move-Out (Temporary Erosion Control	EA		x		=	$ -
130640	Temporary Fiber Roll	LF	80,000	x	3.00	=	$ 240,000
130900	Temporary Concrete Washout	LS	1	x	10,000.00	=	$ 10,000
130710	Temporary Construction Entrance	EA		x		=	$ -
130610	Temporary Check Dam	LS	1	x	50,000.00	=	$ 50,000
130620	Temporary Drainage Inlet Protection	LS	1	x	100,000.00	=	$ 100,000
130730	Street Sweeping	LS	1	x	130,000.00	=	$ 130,000
Supplemental Work for NPDES							
066595	Water Pollution Control Maintenance Sharing*	LS	1	x	30,000.00	=	$ 30,000
066596	Additional Water Pollution Control**	LS	1	x	8,400.00	=	$ 8,400
066597	Storm Water Sampling and Analysis***	LS	1	x	8,400.00	=	$ 8,400

Subtotal NPDES (Without Supplemental Work) *$ 1,924,750*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $20,082,900

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)		Cost
860090	Maintaining Existing Traffic Management System Elements During Construction	LS	1	x	10,000.00	=	$ 10,000
860201	Signal and Lighting	LS	1	x	390,000.00	=	$ 390,000
860297	Signal and Lighting (City)	LS	1	x	450,000.00	=	$ 450,000
860402	Lighting (City Street)	LS	1	x	120,000.00	=	$ 120,000
860460	Lighting and Sign Illuminatino	LS	1	x	1,630,000.00	=	$ 1,630,000
860532	Changeable Message Sign System	LS	1	x	400,000.00	=	$ 400,000
860797	Electric Service (Irrigation)	LS	1	x	20,000.00	=	$ 20,000
860930	Traffic Monitoring Station	LS	1	x	300,000.00	=	$ 300,000
86093X	Temporary Traffic Monitoring Station	LS	1	x	90,000.00	=	$ 90,000
860990	Closed Circuit Television System	LS	1	x	2,015,000.00	=	$ 2,015,000
861100	Ramp Metering System	LS	1	x	200,000.00	=	$ 200,000
86110X	Temporary Ramp Metering System	LS	1	x	150,000.00	=	$ 150,000
860XXX	IAP Toll VTMS	EA	8	x	300,000.00	=	$ 2,400,000

Subtotal Traffic Electrical *$ 8,175,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)		Cost
566011	Roadside Sign - One Post	EA		x		=	$ -
566012	Roadside Sign - Two Post	EA		x		=	$ -
560208	Furnish Sign Structure (Tubular)	SQFT	130,000	x	5.00	=	$ 650,000
560209	Install Sign Structure (Tubular)	SQFT	130,000	x	1.00	=	$ 130,000
568016	Install Sign Panel on Existing Frame	SQFT		x		=	$ -
150711	Remove Painted Traffic Stripe	LF	78,144	x	0.65	=	$ 50,794
141101	Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF		x		=	$ -
561016	60" CIDH Pile (Sign Foundation)	EA	7	x	1,000.00	=	$ 7,000
560244	Furnished Laminated Panel (1"-Type A)	SQFT	504	x	40.00	=	$ 20,160
150712	Remove Painted Pavement Marking	SQFT		x		=	$ -
150742	Remove Roadside Sign	EA		x		=	$ -
152320	Reset Roadside Sign	EA		x		=	$ -
152390	Relocate Roadside Sign	EA		x		=	$ -
84XXXX	Permanent Pavement Delineation	LS	1	x	250,000.00	=	$ 250,000
82010X	Delineator (Class X)	EA		x		=	$ -
840502	Thermoplastic Traffic Stripe (Enhanced Wet Night Visibility)	LF		x		=	$ -
846012	Thermoplastic Crosswalk and Pavement Marking (Enhanced Wet Night Visibility)	SQFT		x		=	$ -
120090	Construction Area Signs	LS	1	x	21,500.00	=	$ 21,500

Subtotal Traffic Signing and Striping *$ 1,129,454*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)		Cost
12865X	Portable Changeable Message Signs	EA	4	x	5,000.00	=	$ 20,000

Subtotal Traffic Management Plan *$ 20,000*

6D - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)		Cost
120199	Traffic Plastic Drum	EA	1,500	x	20.00	=	$ 30,000
12016X	Channelizer (Type X)	EA		x		=	$ -
120120	Type III Barricade	EA		x		=	$ -
129100	Temporary Crash Cushion Module	EA	526	x	200.00	=	$ 105,200
120100	Traffic Control System	LS	1	x	260,000.00	=	$ 260,000
129110	Temporary Crash Cushion	EA		x		=	$ -
129000	Temporary Railing (Type K)	LF	50,000	x	10.00	=	$ 500,000
120149	Temporary Pavement Marking (Paint)	SQFT		x		=	$ -
82010X	Delineator (Class X)	EA		x		=	$ -

Subtotal Stage Construction and Traffic Handling *$ 895,200*

TOTAL TRAFFIC ITEMS $10,219,700

Section 7 DETOURS*

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY	100	x	80.00	=	$	8,000
19801X	Imported Borrow	CY/TON		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON	10	x	1,000.00	=	$	10,000
26020X	Class 2 Aggregate Base	TON/CY		x		=	$	-
250401	Class 4 Aggregate Subbase	CY		x		=	$	-
130620	Temporary Drainage Inlet Protection	EA	25	x	300.00	=	$	7,500
129000	Temporary Railing (Type K)	LF	2,500	x	25.00	=	$	62,500
128601	Temporary Signal System	LS	1	x	20,000.00	=	$	20,000
120149	Temporary Pavement Marking (Paint)	SQFT	1,000	x	4.00	=	$	4,000
80010X	Temporary Fence (Type X)	LF		x		=	$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ 112,000

Section 8 MINOR ITEMS (Use Appropriate percentage between 5%-10%)

Total of Section 1-7 81,233,600 x 10% = $ 8,123,360

TOTAL MINOR ITEMS $ 8,123,400

Section 9 ROADWAY MOBILIZATION*

Item code							
999990	Total Section 1-8	$	89,357,000	x	10%	=	$ 8,935,700

TOTAL MOBILIZATION $ 8,935,700

* For Project less than 50 Working Days "Mobilization" is not required as a separate contract item, however contract item prices should take into consideration mobilization as part of the price.

Note: If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

Section 10 SUPPLEMENTAL WORK

Total Section 1-8 = $ 89,357,000 5% = $ 4,467,850

Item code		Unit	Quantity		Unit Price ($)			Cost
066670	Payment Adjustments For Price Index Fluctuations	LS	1	x	635,849.32	=	$	635,849
066094	Value Analysis	LS	1	x	10,000.00	=	$	10,000
066070	Maintain Traffic	LS	1	x	156,000.00	=	$	156,000
066919	Dispute Resolution Board	LS	1	x	15,000.00	=	$	15,000
066921	Dispute Resolution Advisor	LS		x		=	$	-
066015	Federal Trainee Program	LS	1	x	16,800.00	=	$	16,800
066610	Partnering	LS	1	x	50,000.00	=	$	50,000
066204	Remove Rock and Debris	LS	1	x	10,000.00	=	$	10,000
066222	Locate Existing Crossover	LS	1	x	10,000.00	=	$	10,000

NPDES *Supplemental Work specified in Section 5C* = $ 46,800

TOTAL SUPPLEMENTAL WORK $ 5,418,300

Section 11 STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	Resident Engineers Office	LS	1	x	106,400.00	=	$106,400
066063	Traffic Management Plan - Public Information	LS	1	x	23,500.00	=	$23,500
066901	Water Expenses	LS	1	x	200,000.00	=	$200,000
8609XX	Traffic Monitoring Station (X)	LS		x		=	$0
066841	Traffic Controller Assembly	LS		x		=	$0
066840	Traffic Signal Controller Assembly	LS		x		=	$0
066062	COZEEP Contract	LS	1	x	520,000.00	=	$520,000
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066065	Tow Truck Service Patrol	LS		x		=	$0

TOTAL STATE FURNISHED $849,900

Section 12 CONTINGENCY

Use appropriate percentage based on the detail of estimate. Anything other than the suggested contingency in the PDPM needs to be *justified. (Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Total Section 1-11 $ 104,560,900 x 30% = $31,368,270

TOTAL CONTINGENCY $31,368,300

*Justification:

Section 13 OVERHEAD

Item code		Unit	Quantity		Unit Price ($)		Cost
090100	Time-Related Overhead	WDAY	260	X	26422.69231	=	$6,869,900

Note: If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.

TOTAL OVERHEAD $6,869,900

II. STRUCTURES ITEMS

	Bridge 1	Bridge 2	Bridge 3
DATE OF ESTIMATE	11/10/14	10/29/13	10/29/13
Bridge Name	15/78 HOV Connector	Mission Rd UC (Alt 1)	Woodland Parkway UC
Bridge Number	57-NEW	57-0135	57-0389
Structure Type	CIP/PS Box Girder	CIP Box Girder	PC/PS Rectangular Girder
Width (Feet) [out to out]	58.83 LF	30.50 LF	187.00 LF
Total Bridge Length (Feet)	3287.00 LF	354.00 LF	174.00 LF
Total Area (Square Feet)	193374.21 SQFT	10797.00 SQFT	32538.00 SQFT
Structure Depth (Feet)	9.50 LF	5.50 LF	4.75 LF
Footing Type (pile or spread)	Pile	Spread	Pile
Cost Per Square Foot	$197	$337	$193
COST OF EACH STRUCTURE	**$38,112,000.00**	**$3,642,000.00**	**$6,287,000.00**

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	0.00 LF	0.00 LF	0.00 LF
Total Length (Feet)	0.00 LF	0.00 LF	0.00 LF
Total Area (Square Feet)	0.00 SQFT	0.00 SQFT	0.00 SQFT
Structure Depth (Feet)	0.00 LF	0.00 LF	0.00 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$0.00	$0.00	$0.00
COST OF EACH STRUCTURE	**$0.00**	**$0.00**	**$0.00**

TOTAL COST OF BRIDGES	**$48,041,000.00**
TOTAL COST OF BUILDINGS	**$0.00**
TOTAL COST OF STRUCTURES[1]	**$48,041,000.00**

Estimate Prepared By: Ramin Rashedi ---- Division of Structures

3/23/15
Date

[1]Structure's Estimate includes Overhead and Mobilization.

III. RIGHT OF WAY

A)	Acquisition, including Excess Lands, Fees, Damages, Goodwill, Mitigation, SB-1210, Expert Witness, and Railroad	$	5,402,840
B)	Utility Relocation (State Share) + Potholing (Design Phase)	$	11,932,750
C)	Utility - Advance Engineering Estimate	$	0
D)	RAP and/or Last Resort Housing	$	0
E)	Clearance & Demolition	$	0
F)	Title and Escrow	$	24,620

G)	**TOTAL R/W ESTIMATE:**	**$17,335,590.00**
H)	**TOTAL R/W ESTIMATE: Escalated to Certification Date**	**$22,027,000.00**
I)	**RIGHT OF WAY SUPPORT:**	**$141,022.00**

Support Cost Estimate Prepared By	Carol Vu, Project Coordinator[1]	688-6063 Phone
Utility Estimate Prepared By	Roberto Gotay, Utility Coordinator[2]	688-3216 Phone
R/W Acquisition Estimate Prepared By	Andrew Bartlett, Right of Way Estimator[3]	688-2519 Phone

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

IV. SUPPORT COST ESTIMATE SUMMARY

Run a Support Cost Estimate Summary report (D11 Project Management Support onramp) for component data.

Total by FY		PA&ED	PS&E[1]	RW	CON[1]	Total
< 2005	Expended					
2006	Expended					
2007	Expended					
2008	Expended					
2009	Expended					
2010	Expended					
2011	Expended					
2012	Expended					
2013	Expended					
2014	Expended					
2015	Expended ETC					
2016	Expended ETC					
2017	Expended ETC	$1,187,034				$1,187,034
2018	Expended ETC	$1,689,184				$1,689,184
2019	Expended ETC	$2,066,568				$2,066,568
2020	Expended ETC	$1,854,656	$3,500,000			$5,354,656
2021	Expended ETC	$165,872	$6,000,000	$98,322		$6,264,194
2022	Expended ETC		$7,000,000	$42,700		$7,042,700
2023	Expended ETC					
2024	Expended ETC				$6,500,000	$6,500,000
2025	Expended ETC				$7,500,000	$7,500,000
2026	Expended ETC				$9,500,000	$9,500,000
2027	Expended ETC					
2028	Expended ETC					
2029	Expended ETC					
> 2030	Expended ETC					
EAC (Expended + ETC)		$6,963,314	$16,500,000	$141,022	$23,500,000	$47,104,336
Programmed COS						
Support Ratio		3%	8%	0%	11%	23%

1. Support costs for PS&E and CON are preliminary estimates. Workplans for these phases will be developed during PAED.

Total Capital Cost:	**$208,176,000**
Total Support Ratio:	**23%**

PRSM workplan hours/costs verified against approved MWA: N/A - Refer to page 1 (Introduction) of the PSR-PDS)

Office Chief - Mark Parra — Date

Approved by: Karen M. Young

Project Control - Karen Young — Date: 3-20-15

Verified PA&ED & R/W Support only

Option 3A

11- PAGE ESTIMATE

EA 11-42170 PID 11XXXXXXXX

Type of Estimate : Project Study Report
Program Code : SHOPP
Project Limits : SR-78 PM 13.0/14.1

Description: **In San Diego County in San Marcos on Route 78 from 0.1 Mile East of Twin Oaks Valley Road Overcrossing to 0.1 Mile West of Woodland Parkway Undercrossing.**

Scope : Construct WB auxiliary lane
Alternative :

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 9,276,000.00	$ 9,768,456.00
STRUCTURE ITEMS	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 9,276,000.00	$ 9,768,456.00
RIGHT OF WAY	$ -	$ -
TOTAL CAPITAL COST	**$ 9,276,000.00**	**$ 9,769,000.00**
PR/ED SUPPORT		$ 650,000.00
PS&E SUPPORT		$ 930,000.00
RIGHT OF WAY SUPPORT		$ 10,000.00
CONSTRUCTION SUPPORT		$ 1,610,000.00
TOTAL SUPPORT COST		**$ 3,200,000.00**
TOTAL PROJECT COST	**$ 9,300,000.00**	**$ 13,000,000.00**

	month	year
Date (Month/Year) of Estimate	4	/ 2015
Estimated Date (Month/Year) of Construction	1	/ 2017
Number of Months of Escalation	21	
Number of Years of Escalation	1.75	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days		
Number of Plant Establishment Days		

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Reviewed by: Victor H Cardenas 4/7/15 (619) 688-3670
Victor Cardenas, Design Manager — Date — Phone

Approved by: Karen M. Jewel 4/7/15 (619) 688-6803
Karen Jewel, Project Manager — Date — Phone

Escalation rates used in this estimate for Highway Construction Capital Costs are 3.0% compounded annually to Construction year. The decision to use 3.0% for this estimate was as per the Office of Office Engineer. (REV03/12/14)

Exhibit 7a

Option 3B

11- PAGE ESTIMATE

EA 11-42160 PID 11XXXXXXXX

Type of Estimate : Project Study Report
Program Code : SHOPP
Project Limits : PM 12.9/13.9
Description: **In San Diego County in San Marcos on Route 78 from Twin Oaks Valley Overcrossing to 0.3 Mile West of Woodland Parkway Undercrossing.**
Scope : Construct EB auxiliary lane
Alternative :

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 10,197,600.00	$ 10,738,983.00
STRUCTURE ITEMS	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 10,197,600.00	$ 10,738,983.00
RIGHT OF WAY	$ -	$ -
TOTAL CAPITAL COST	**$ 10,198,000.00**	**$ 10,739,000.00**
PR/ED SUPPORT		$ 710,000.00
PS&E SUPPORT		$ 1,020,000.00
RIGHT OF WAY SUPPORT		$ 10,000.00
CONSTRUCTION SUPPORT		$ 1,760,000.00
TOTAL SUPPORT COST		**$ 3,500,000.00**
TOTAL PROJECT COST	**$ 10,200,000.00**	**$ 14,250,000.00**

	month	year
Date (Month/Year) of Estimate	4	/ 2015
Estimated Date (Month/Year) of Construction	1	/ 2017
Number of Months of Escalation	21	
Number of Years of Escalation	1.75	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days		
Number of Plant Establishment Days		

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Reviewed by: Victor H Cardenas 4/7/15 (619) 688-3670
Victor Cardenas, Design Manager — Date — Phone

Approved by: Karen M. Jewel 4/7/15 (619) 688-6803
Karen Jewel, Project Manager — Date — Phone

Escalation rates used in this estimate for Highway Construction Capital Costs are 3.0% compounded annually to Construction year. The decision to use 3.0% for this estimate was as per the Office of Office Engineer. (REV03/12/14)

Exhibit 7b

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

To: MOHAMAD KHATIB
SENIOR TRANSPORTATION ENGINEER

Date: November 13, 2014

File: 11-SD-15/SR78
11-29060K
15/78 HOV Connector Bridge
Bridge No. 57-New
Bridge No. 0358
Bridge No. 0135

From: RAMIN RASHEDI
Bridge Design Branch 11
Office of Bridge Design South
Structure Design
Division of Engineering Services MS 9

Subject: Advance Planning Study Transmittal

Attached are copies of the updated Advance Planning Study for the above referenced project as submitted to the Division of Engineering Services by your Request E-mail dated October 2nd, 2014.

The updated estimate for the construction cost, including 10% mobilization and 25% contingencies, is as follows:

Structure Name	Bridge No.	Estimated Cost
15/78 HOV Connector, CIP/PS Concrete Box Girder Bridge	57-New	$38,112,000
15/78 HOV Connector, Alternative 2A	57-New	$47,385,000 (feasibility study only)
15/78 HOV Connector, Alternative 2B	57-New	$41,912,000 (feasibility study only)
Woodland Pkwy UC	57-0389	$6,287,000
Mission Road OC CIP/PS Concrete Box Girder Bridge	57-0135	$3,642,000

This Advance Planning Study and associated cost estimate is based on the following assumptions:

1. No geotechnical subsurface information is available for the proposed bridge site. The data available are based on the Log of Test Boring for North and South Connector Overcrossing bridges Nos. 57-0816F & 57-0815G.

2. Pile foundation system is used for bridge abutments.

3. Foundation drilling is required to determine the final bridge pile type at bents and abutments.

4. Traffic will pass through the construction site. 15'-0" minimum vertical clearance is required under the false work.

5. The constraints for the bridge construction are at Washington Ave., Mission Ave. U.C., Route 78 and the existing mitigation site.

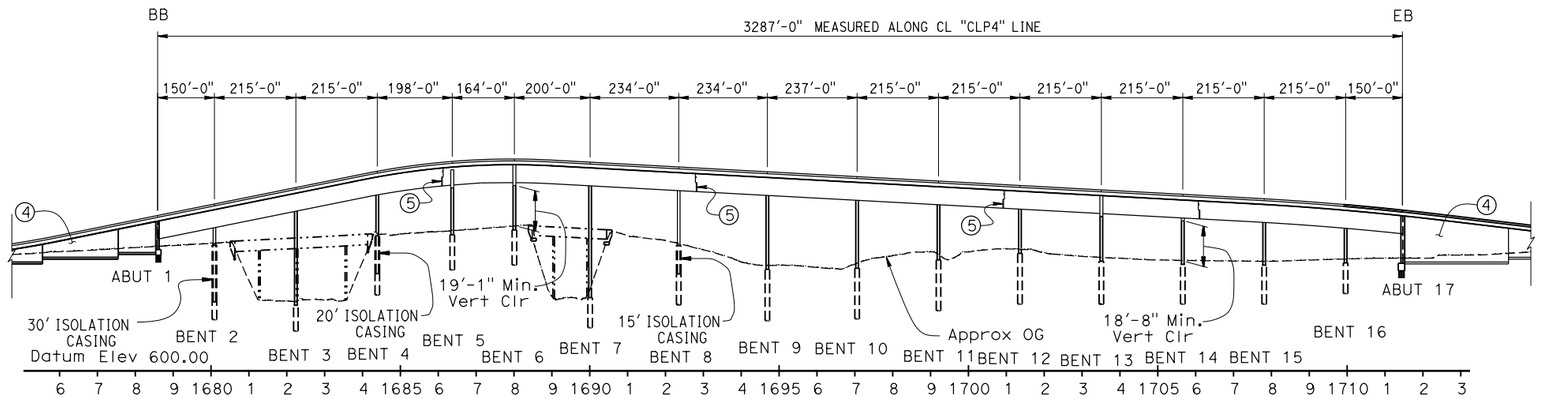
If you have any questions or if you need additional information regarding this study, please contact Dary Tavatli at (916)-227-8327 or myself at (916)-227-8222.

Attachments

c: Elias Kurani, Bridge Design Office Chief
Dan Adams, Sr Bridge Engineer
Rachel Mueller, District Project Engineer
Abbas Abghari, Geotechnical Design
Angel Perez-Cobo, Geotechnical Design
Quincy Wong, Aesthetics
Kevin Wall, Maintenance & Investigation
Andrew S Lee, Preliminary Investigation-South
John Babcock, Structure Construction
Feiruz Aberra, TLE to District 8 & 11, Bridge Design South 2
Paul Chung, Sr Bridge Engieer

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

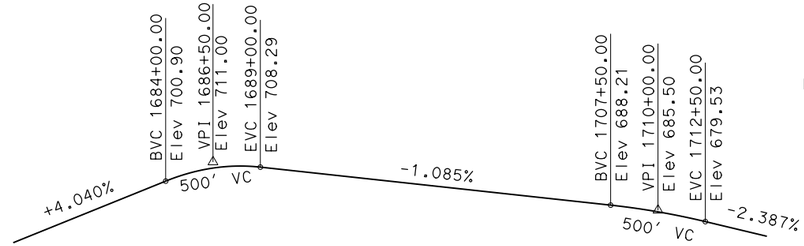
DIST	COUNTY	ROUTE	POST MILE
11	SD	15/78	X



DEVELOPED ELEVATION

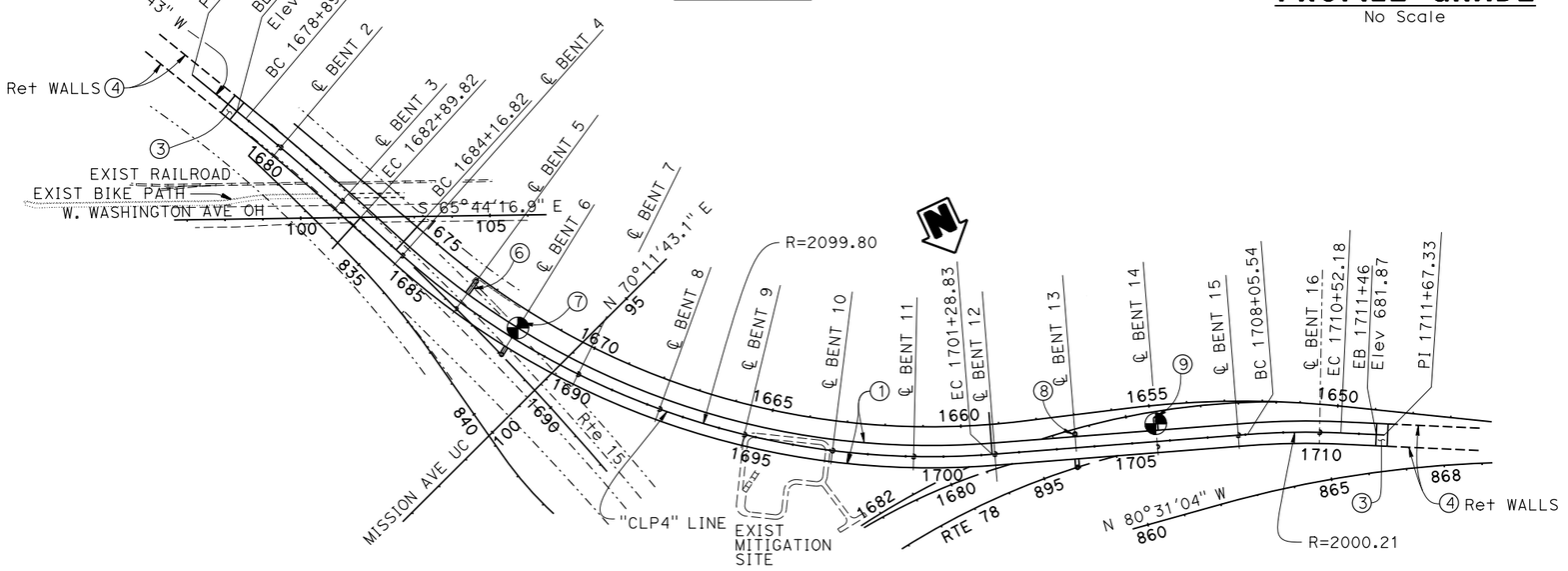
1"=200' Horiz
1"=40' Vert

DATE OF ESTIMATE		11/10/14
BRIDGE REMOVAL	=	-
STRUCTURE DEPTH	=	9.5
LENGTH	=	3287.00
WIDTH	=	58.83
AREA	=	193,374
COST/ □_ INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	=	$197
TOTAL COST	=	$38,112,000



PROFILE GRADE

No Scale



PLAN

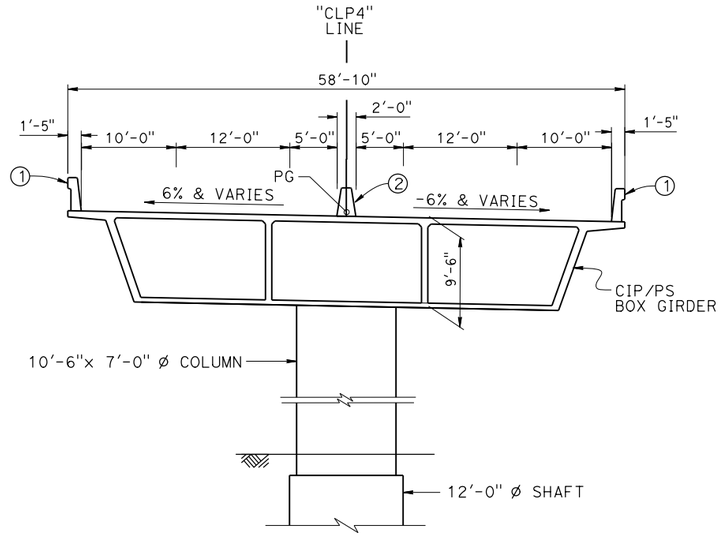
1"=200'

NOTES:

1. CONCRETE BARRIER TYPE 742
2. CONCRETE BARRIER TYPE 60A
3. STRUCTURE APPROACH SLAB
4. MSE WALLS SEE "15/78 HOV CONNECTOR MSE WALLS" SHEET
5. HINGE
6. LEFT COLUMN = 70' Lt OF "CLP4" LINE
   RIGHT COLUMN = 20' Rt OF "CLP4" LINE
7. LEFT COLUMN = 47' Lt OF "CLP4" LINE
   RIGHT COLUMN = 53' Rt OF "CLP4" LINE
8. LEFT COLUMN = 36'-6" Lt OF "CLP4" LINE
   RIGHT COLUMN = 51'-9" Rt OF "CLP4" LINE
9. LEFT COLUMN = 60' Lt OF "CLP4" LINE
   RIGHT COLUMN = 14' Rt OF "CLP4" LINE
10. OUTRIGGER BENTS ARE 11' DEEP

LEGEND:

◒ INDICATES POINT OF MINIMUM VERTICAL CLEARANCE



TYPICAL SECTION

1/8"=1'-0"

EXHIBIT 8

DESIGNED BY Phu Nguyen	DATE 11-5-14	STRUCTURE DESIGN BRANCH 11	PLANNING STUDY
DRAWN BY T. Bittermann	DATE 11-5-14		15/78 HOV CONNECTOR
CHECKED BY D. TAVATLI	DATE 11-6-14		UNIT: 3587 / BRIDGE No. 57-NEW
APPROVED R. RASHEDI	DATE 11-6-14		SCALE: As Shown / PROJECT No. & PHASE: 1112000131

CONTRACT No.: X

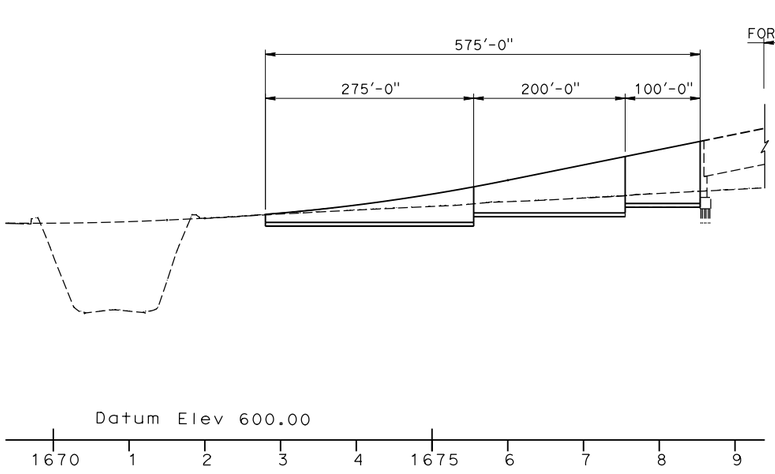
STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 08-09-10)

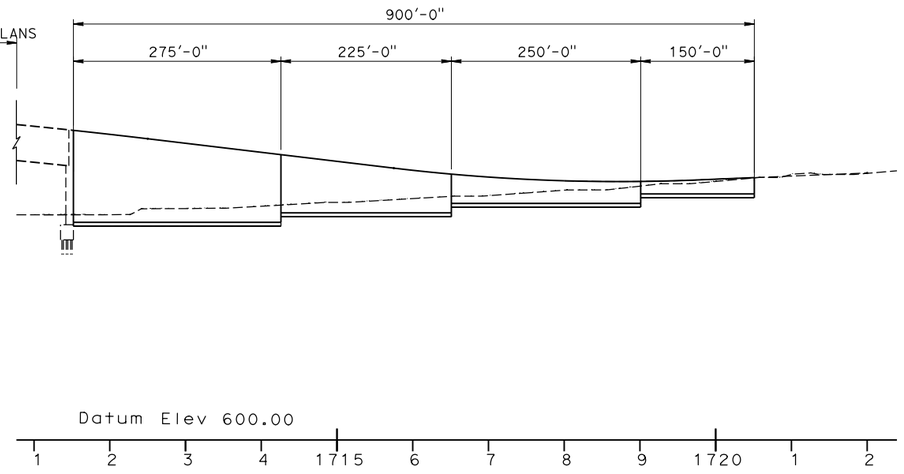
FILE => aps-11-xxxx-gp1a.dgn

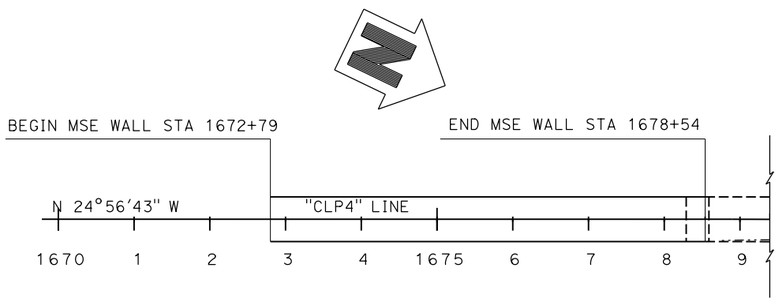
USERNAME => s114300 DATE PLOTTED => 12-NOV-2014 TIME PLOTTED => 09:47

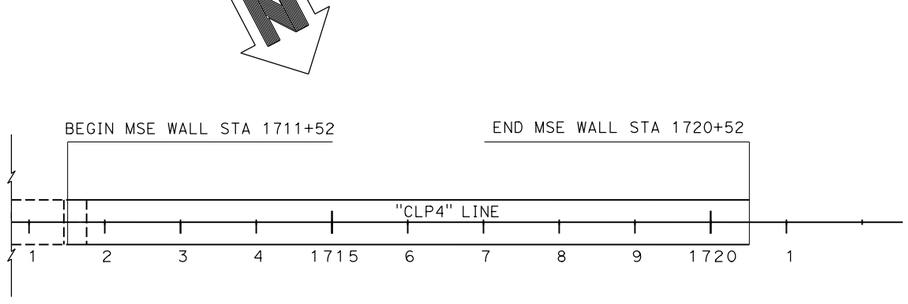
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

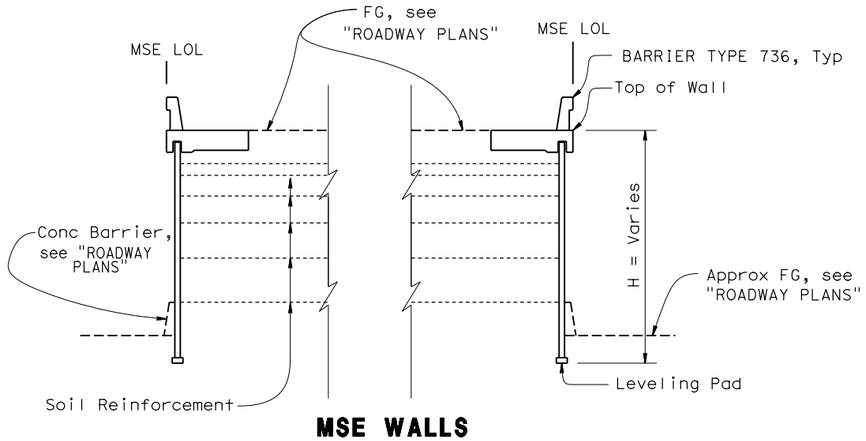
DIST	COUNTY	ROUTE	POST MILE
11	SD	15/78	X











MSE WALLS TYPICAL SECTION

No Scale

NOTE:
TYPE 1 RETAINING WALL MAY BE USED IF TEMPORARY CONSTRUCTION EASEMENTS PERMIT WALL FOOTING CONSTRUCTION.

EXHIBIT 8

DESIGNED BY Phu Nguyen	DATE 11-7-14	STRUCTURE DESIGN BRANCH 11	PLANNING STUDY
DRAWN BY T. Bittermann	DATE 11-7-14		15/78 HOV CONNECTOR MSE WALLS
CHECKED BY Dary Tavatli	DATE 11-7-14		UNIT: 3587 / BRIDGE No. 57-NEW
APPROVED Ramin Rashedi	DATE 11-7-14		SCALE: AS NOTED / PROJECT No. & PHASE: X

PREPARED FOR THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
11	SD	78	15.0

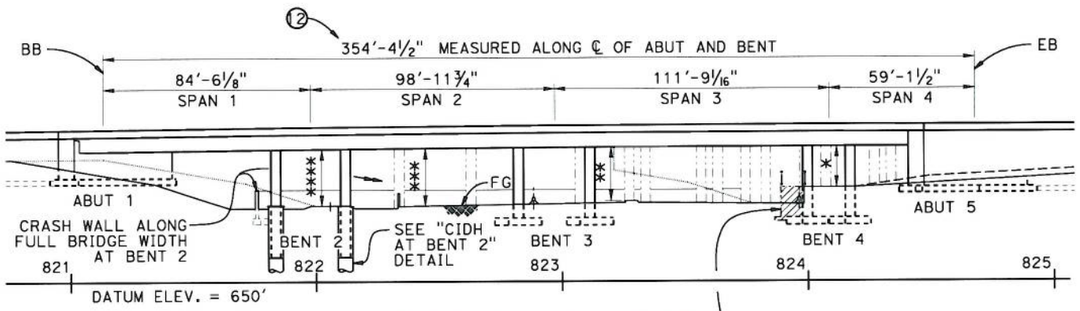
Date of estimate	=	10-29-2013
Structure Depth	=	5'-6" ±
Length	=	354 LF
Width	=	30.5 ft
Area	=	10,797 SF
Cost per Sq. Ft. including 10% mobilization &	=	$ 337
25% contingency (total)	=	$ 3,642,000

* 16'-0"± min vert clearance (no pedestrian traffic during construction)

** 22'-6"± min vert clearance at raised median (Mission Rd)

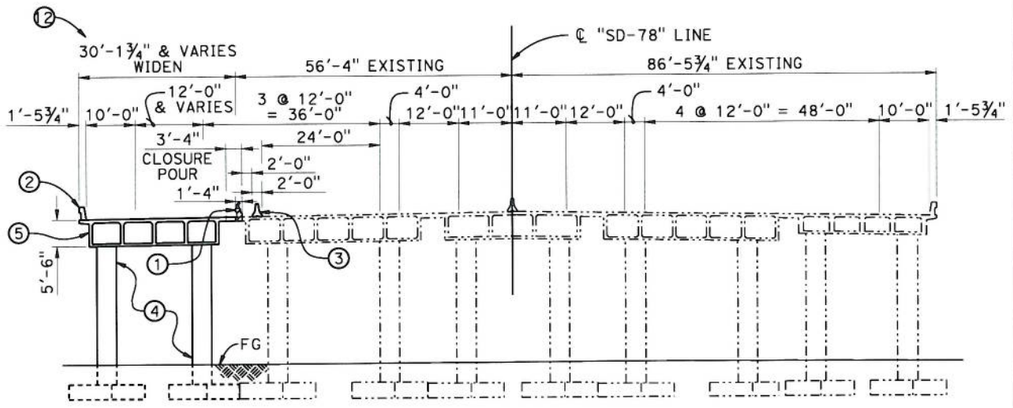
*** 25'-0"± min vert clearance at Inland Rail Trail

**** 23-0" min vert clearance at NCTD tracks



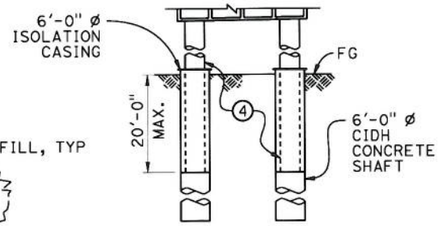
MIRROR ELEVATION

1" = 30'-0"



TYPICAL SECTION

1" = 15'-0"



CIDH AT BENT 2

1" = 15'-0"

WIDENING BENT ℄ BEARINGS *	
BENT 2	N46°13'19"±W
BENT 3	N46°16'40"±W
BENT 4	N30°21'14"±W

* To be verified by surveys

PLAN

1" = 30'-0"

CURVE DATA

Ⓐ	Ⓑ
R = 3000'	R = 3000'
Δ = 16°39'26"	Δ = 5°23'00"
T = 439.18'	T = 141.04'
L = 872.17'	L = 281.87'

NOTES

① Remove existing railing & portion of overhang
② Concrete Barrier Type 736
③ Temporary Railing, Type K
④ 4'-0" ø Columns
⑤ Cast-In-Place P/S Concrete Box Girder
⑥ Structure Approach Type N(30S)
⑦ Remove existing railing & portion of wingwall 3'-0" below FG
⑧ Remove sign structure
⑨ Remove existing trees
⑩ Remove portion of existing retaining wall
⑪ Remove and replace exisiting concrete barrier (underneath bridge)
⑫ Hot Mix Asphalt Overlay (2" thick at widen)
◕ Point of Minimum Vertical Clearance at Railroad
⊗ Point of Minimum Vertical Clearance at Roadway

EXHIBIT 8

DESIGNED BY:	J. Szabo	DATE:	10/1/2013
DRAWN BY:	J. Szabo	DATE:	10/6/2013
CHECKED BY:		DATE:	
APPROVED:	Dan T. Adams	DATE:	10/6/2013

J. Szabo
PROJECT ENGINEER

ALTERNATIVE NO. 1
PLANNING STUDY
MISSION ROAD OH (WB WIDEN)

BRIDGE NO.	57- 0135	CU	
SCALE	AS NOTED	EA	11-2T240

FILE => 101APSMissnOHboxCIP.dgn

...IONS REVISED SHEET

PROBABILISTIC STRUCTURE COST ESTIMATE

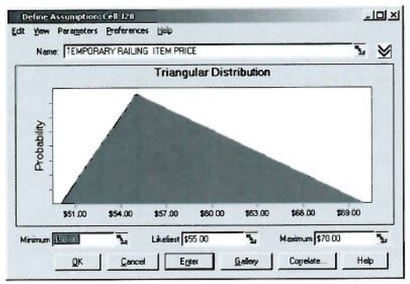
[ ] GENERAL PLAN ESTIMATE [X] ADVANCE PLANNING ESTIMATE

Revised - August 29, 2013

BRIDGE NAME:	MISSION ROAD OH WIDEN (WB) [ALT 1]
BRIDGE NUMBER:	57-0135
TYPE:	CIP BOX GIRDER
CU:	11
EA:	2T241K
PROJECT ID:	1112000152
DESIGN SECTION:	10
# OF STRUCTURES IN PROJECT :	17
PRICES BY :	TNC
PRICES CHECKED BY :	
QUANTITIES BY:	JS

IN EST:	10/7/2013
OUT EST:	10/29/2013
DISTRICT:	11
CO:	SD
RTE:	78
PM:	15.10
DEPTH	5.50
LENGTH	354
WIDTH	31
AREA	10,797
EST. NO.	1
COST INDEX:	389
DATE:	
DATE:	10/1/2013

INPUT



The Assumption Curves, unless noted otherwise, are modeled with a triangular distribution with the "Minimum, Likeliest and Maximum values."

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	ITEM PRICE RANGE MINIMUM	LIKELIEST	MAXIMUM	AMOUNT
1	~~TEMPORARY RAILING~~	~~K~~	~~LF~~	~~380~~				
2	~~REMOVE CONCRETE~~		~~CY~~	~~18~~				
3	~~REMOVE BARRIER~~		~~LF~~	~~386~~				
4	STRUCTURE EXCAVATION (BRIDGE)		CY	1,265	$65.00	$70.00	$75.00	$88,550
5	STRUCTURE BACKFILL (BRIDGE)		CY	780	$70.00	$77.00	$85.00	$60,060
6	STRUCTURAL CONCRETE, BRIDGE		CY	1,450	$650.00	$770.00	$850.00	$1,116,500
7	STRUCTURAL CONCRETE, BRIDGE FOOTING		CY	250	$420.00	$460.00	$500.00	$115,000
8	STRUCTURAL CONCRETE, APPROACH SLAB		CY	85	$610.00	$660.00	$700.00	$56,100
9	BAR REINFORCING STEEL (BRIDGE)		LB	465,000	$0.95	$1.10	$1.20	$511,500
10	BRIDGE DECK DRAINAGE SYSTEM		LB	4,250	$6.00	$6.50	$7.00	$27,625
11	DRILL & BOND DOWEL ~~BARS~~		LF	468	$30.00	$33.00	$35.00	$15,444
12	JOINT SEAL ASSEMBLY (MR 3")		LF	51	$280.00	$300.00	$320.00	$15,300
13	JOINT SEAL ASSEMBLY (MR 2 1/2")		LF	57	$280.00	$300.00	$320.00	$17,100
14	CONCRETE BARRIER	736 (MOD)	LF	380	$120.00	$130.00	$140.00	$49,400
15	ISOLATION CASING		LBS	17,100	$5.00	$5.50	$6.00	$94,050
16	72" CIDH PILING		LF	200	$800.00	$850.00	$900.00	$170,000
17	~~ARCHITECTURAL TREAMENT (BARRIER)~~		~~SF~~	~~700~~				
18	ARCHITECTURAL TREAMENT (RETURN WALL)		SF	580	$20.00	$22.00	$25.00	$12,760
19	HOT MIX ASPHALT (BRIDGE)		TON	110	$150.00	$175.00	$200.00	$19,250
20	PRESTRESSING CAST-IN-PLACE CONCRETE		LB	22,500	$2.30	$2.50	$2.85	$56,250
21	~~FURNISH POLYESTER CONC OVERLAY (3/4")~~		~~CF~~	~~550~~				
22	~~PLACE POLYESTER CONC OVERLAY (3/4")~~		~~SF~~	~~8,800~~				
23	~~PREPARE CONCRETE BRIDGE DECK SURFACE~~		~~SF~~	~~8,800~~				
24	~~CLEAN EXPANSION JOINT~~		~~SF~~	~~156~~				
25	BRIDGE REMOVAL (PORTION)		LS	1	$38,000.00	$40,000.00	$42,000.00	$40,000
26								
27								
28								
29								
30								
							SUBTOTAL	$2,464,889
	TIME RELATED OVERHEAD					5%		$123,244
	MOBILIZATION					10%		$287,570
	SUBTOTAL BRIDGE ITEMS							$2,875,704
	CONTINGENCIES					25%		$718,926
							SUBTOTAL	$3,594,630

Comments
Revised Joint Seals to Joint Seal Assemblies.
Changed Miscellaneous Metal (Drainage) to Bridge Deck Drainage System
Architectural treatment on barrier is included in the barrier's price.
Temporary Railing is a District item
Revised remove concrete and barrier to Bridge Removal (Portion) LS.

	TYPE	UNIT	QUANTITY	MINIMUM	LIKELIEST	MAXIMUM
BRIDGE REMOVAL						

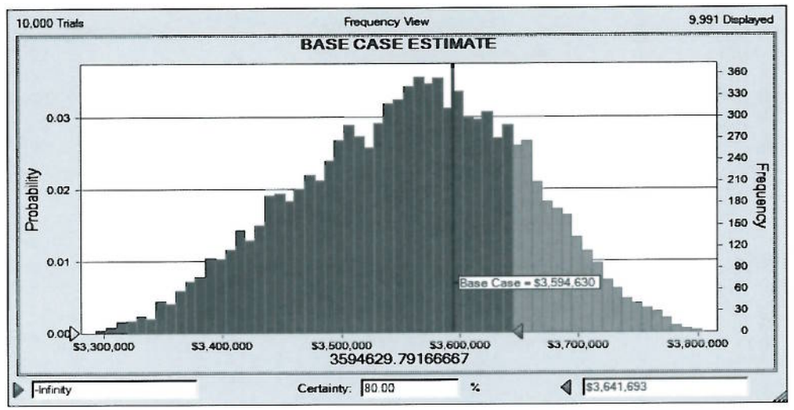
NCLUDES TRO, MOBILIZATION AND CONTINGENCY

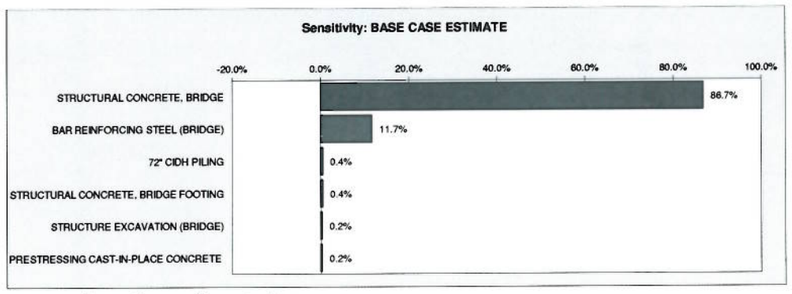
Notes
Highlighted cells represent the quantities and prices that are included in the model.
Base Case Estimate is the sum of the Quantity multplied by "Likeliest" Item Price

BASELINE ESTIMATE TO ASSUMED MIDPOINT OF CONSTRUCTION	
BASE CASE ESTIMATE	$3,594,630

OUTPUT

The estimate ranges generated below were prepared using Crystal Ball software. Crystal Ball software automatically calculates and records the results of thousands of different "what if" cases. Analysis of these scenarios reveals to you the range of possible outcomes, their probability of occurring, the inputs that most impact your model, and where you should focus your efforts.





Percentiles:	Forecast values	
0%	$3,249,500	
10%	$3,428,583	
20%	$3,472,746	
30%	$3,507,466	
40%	$3,536,939	
50%	$3,562,549	
60%	$3,586,121	
70%	$3,612,984	Recommended Range
80%	$3,641,693	
90%	$3,677,319	
100%	$3,802,732	

BASED ON THE ASSUMPTIONS USED TO CREATE THE MODEL, THE DES-STRUCTURE OFFICE ENGINEER RECOMMENDS THAT THE PROGRAMMING LEVEL BUDGET FOR THIS PROJECT BE DESIGNATED AT THE 80% FORECAST VALUE.

80% FORECAST VALUE = $3,642,000.00

***80% Forecast Value Escalated Budget Estimate to Assumed Midpoint of Construction**

Years Beyond Midpoint	Escalation Rate	Escalated Budget Est.
1	0.30%	$3,653,000
2	1.40%	$3,704,000
3	2.50%	$3,797,000
4	2.90%	$3,907,000
5	2.50%	$4,005,000

* Escalated structure cost is provided for information only, actual construction costs may vary. Escalated structure costs provided do not replace Departmental policy to update cost estimates annually. Escalation rates used are based on Global Insight data posted at http://www.dot.ca.gov/hq/oppd/costest/data.htm. Web page updated April 2011.

80 % Forecast		3,642,000
BRIDGE COST PER SQUARE FOOT	=	$337
BRIDGE REMOVAL	=	

Bridge Cost per Square Foot and/or Bridge Removal costs modeled independently. Their 80% Forecast Values Provided for informational purposes only.

EXHIBIT 8

PREPARED FOR THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
11	SD	78	15.0

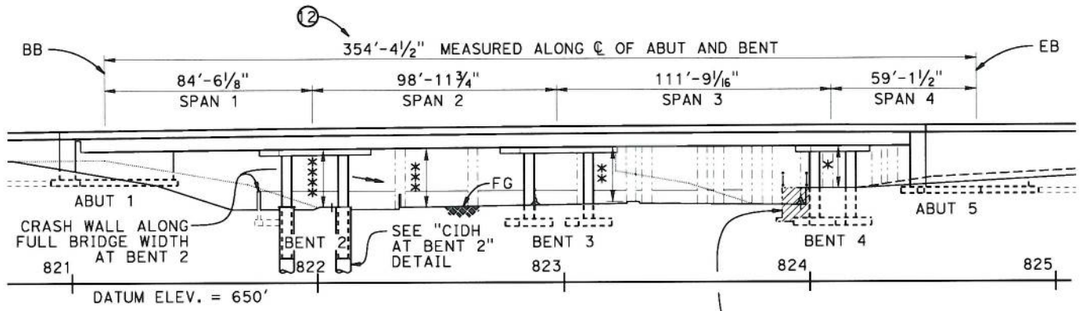
Date of estimate	=	10-1-2013
Structure Depth	=	5'-0" ±
Length	=	354 LF
Width	=	30.5 ft
Area	=	10,797 SF
Cost per Sq. Ft. including		
10% mobilization &	=	$321
25% contingency	=	$3,467,000

* 16'-0"± min vert clearance (no pedestrian traffic during construction)

** 22'-6"± min vert clearance at raised median (Mission Rd)

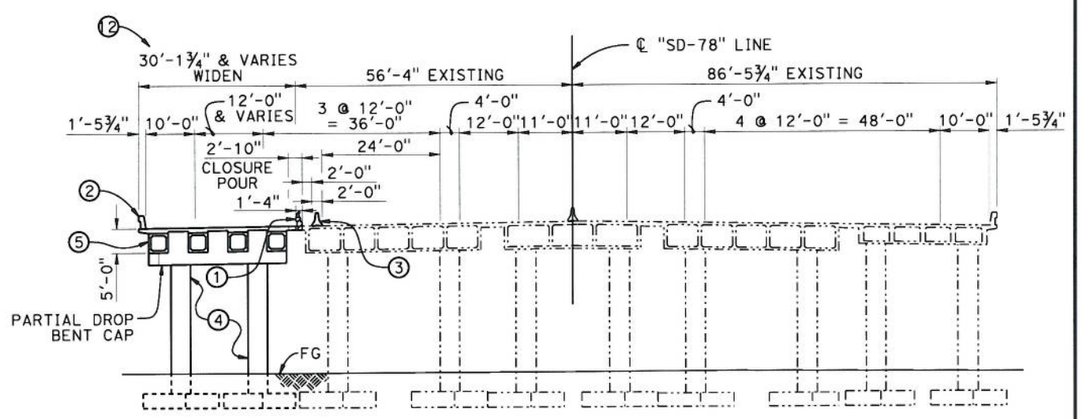
*** 25'-0"± min vert clearance at Inland Rail Trail

**** 23-0" min vert clearance at NCTD tracks



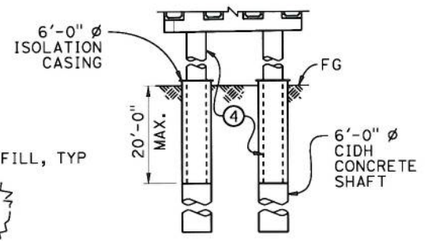
MIRROR ELEVATION

1" = 30'-0"



TYPICAL SECTION

1" = 15'-0"



CIDH AT BENT 2

1" = 15'-0"

WIDENING BENT ℄ BEARINGS *	
BENT 2	N46°13'19"±W
BENT 3	N46°16'40"±W
BENT 4	N30°21'14"±W

* To be verified by surveys

NOTES

1. Remove existing railing & portion of overhang
2. Concrete Barrier Type 736
3. Temporary Railing, Type K
4. 4'-0" ø Columns
5. PC/PS 4' x 4' Concrete Box Girder
6. Structure Approach Type N(30S)
7. Remove existing railing & portion of wingwall 3'-0" below FG
8. Remove sign structure
9. Remove existing trees
10. Remove portion of existing retaining wall
11. Remove and replace exisiting concrete barrier (underneath bridge)
12. Hot Mix Asphalt Overlay (2" thick at widen)

Point of Minimum Vertical Clearance at Railroad

Point of Minimum Vertical Clearance at Roadway

CURVE DATA

(A)	(B)
R = 3000'	R = 3000'
Δ = 16°39'26"	Δ = 5°23'00"
T = 439.18'	T = 141.04'
L = 872.17'	L = 281.87'

PLAN

1" = 30'-0"

EXHIBIT 8

DESIGNED BY:	J. Szabo	DATE:	10/1/2013
DRAWN BY:	J. Szabo	DATE:	10/6/2013
CHECKED BY:		DATE:	
APPROVED:	Dan T. Adams	DATE:	10/6/2013

J. Szabo
PROJECT ENGINEER

ALTERNATIVE NO. 2

PLANNING STUDY

MISSION ROAD OH (WB WIDEN)

BRIDGE NO.	57- 0135	CU	
SCALE	AS NOTED	EA	11-2T240

LOCATION => 11TRK
TIME PLOTTED => 11:10A
DATE PLOTTED => 06-OCT-2014
FILE => 101APSMissnOHboxPC.dgn

...IONS REVISED SHEET

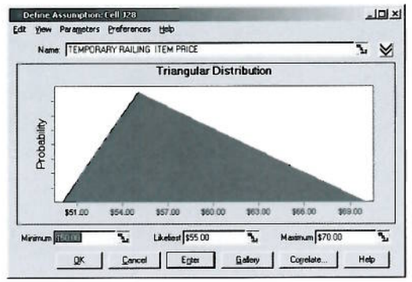
PROBABILISTIC STRUCTURE COST ESTIMATE

[ ] GENERAL PLAN ESTIMATE [X] ADVANCE PLANNING ESTIMATE

Revised - August 29, 2013

		IN EST:	10/7/2013
		OUT EST:	10/29/2013
BRIDGE NAME:	MISSION ROAD OH WIDEN (WB) [ALT 2]		
BRIDGE NUMBER:	57-0135	**DISTRICT:**	11
TYPE:	PC/PS GIRDER (Type B IV-48 AASHTO)	**CO:**	SD
CU:	11	**RTE:**	78
EA:	2T241K	**PM:**	15.10
PROJECT ID:	1112000152	**DEPTH**	5.00
		LENGTH	354
DESIGN SECTION:	10	**WIDTH**	31
# OF STRUCTURES IN PROJECT :	17	**AREA**	10,797
		EST. NO.	1
PRICES BY :	TNC	**COST INDEX:**	389
PRICES CHECKED BY :		**DATE:**	
QUANTITIES BY:	JS	**DATE:**	10/1/2013

INPUT



The Assumption Curves, unless noted otherwise, are modeled with a triangular distribution with the "Minimum, Likeliest and Maximum values."

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	MINIMUM	LIKELIEST	MAXIMUM	AMOUNT
1	~~TEMPORARY RAILING~~	~~K~~	~~LF~~	~~380~~				
2	~~REMOVE CONCRETE~~		~~CY~~	~~18~~				
3	~~REMOVE BARRIER~~		~~LF~~	~~386~~				
4	STRUCTURE EXCAVATION (BRIDGE)		CY	1,265	$65.00	$70.00	$75.00	$88,550
5	STRUCTURE BACKFILL (BRIDGE)		CY	780	$70.00	$77.00	$85.00	$60,060
6	FURNISH PC/PS CONCRETE BOX GIRDER (50'-60')		EA	4	$14,500.00	$18,000.00	$22,000.00	$72,000
7	FURNISH PC/PS CONCRETE BOX GIRDER (80'-90')		EA	4	$22,500.00	$28,000.00	$34,000.00	$112,000
8	FURNISH PC/PS CONCRETE BOX GIRDER (90'-100')		EA	4	$25,500.00	$31,500.00	$38,000.00	$126,000
9	FURNISH PC/PSCONCRETE BOX GIRDER (100'-110')		EA	4	$28,000.00	$35,000.00	$42,000.00	$140,000
10	ERECT PC/PS CONCRETE BOX GIRDER		EA	4	$4,500.00	$5,500.00	$6,500.00	$22,000
11	STRUCTURAL CONCRETE, BRIDGE		CY	1,100	$500.00	$650.00	$750.00	$715,000
12	STRUCTURAL CONCRETE, BRIDGE FOOTING		CY	250	$420.00	$460.00	$500.00	$115,000
13	STRUCTURAL CONCRETE, APPROACH SLAB		CY	85	$610.00	$660.00	$700.00	$56,100
14	BAR REINFORCING STEEL (BRIDGE)		LB	360,900	$0.95	$1.10	$1.20	$396,990
15	BRIDGE DECK DRAINAGE SYSTEM		LB	4,250	$6.00	$6.50	$7.00	$27,625
16	DRILL & BOND DOWEL ~~BARS~~		LF	468	$30.00	$33.00	$35.00	$15,444
17	JOINT SEAL ASSEMBLY (MR 3")		LF	51	$280.00	$300.00	$320.00	$15,300
18	JOINT SEAL ASSEMBLY (MR 2 1/2")		LF	57	$280.00	$300.00	$320.00	$17,100
19	CONCRETE BARRIER	736 (MOD)	LF	380	$120.00	$130.00	$140.00	$49,400
20	ISOLATION CASING		LBS	17,100	$5.00	$5.50	$6.00	$94,050
21	72" CIDH PILING		LF	200	$800.00	$850.00	$900.00	$170,000
22	~~ARCHITECTURAL TREAMENT (BARRIER)~~		~~SF~~	~~700~~				
23	ARCHITECTURAL TREAMENT (RETURN WALL)		SF	580	$20.00	$22.00	$25.00	$12,760
24	~~FURNISH POLYESTER CONC OVERLAY (3/4")~~		~~CF~~	~~550~~				
25	~~PLACE POLYESTER CONC OVERLAY (3/4")~~		~~SF~~	~~8,800~~				
26	~~PREPARE CONCRETE BRIDGE DECK SURFACE~~		~~SF~~	~~8,800~~				
27	~~CLEAN EXPANSION JOINT~~		~~SF~~	~~156~~				
28	BRIDGE REMOVAL (PORTION)		LS	1	$38,000.00	$40,000.00	$42,000.00	$40,000
29								
30							SUBTOTAL	$2,345,379

TIME RELATED OVERHEAD			$117,269
MOBILIZATION	5%		$273,628
SUBTOTAL BRIDGE ITEMS	10%		$2,736,276
CONTINGENCIES			$684,069
	25%	SUBTOTAL	$3,420,344

Comments
Revised Joint Seals to Joint Seal Assemblies.
Changed Miscellaneous Metal (Drainage) to Bridge Deck Drainage System
Revised item names for PC/PS Concrete Box Girder base on the length.
Architectural treatment on barrier is included in the barrier's price.
Temporary Railing is a District item
Revised remove concrete and barrier to Bridge Removal (Portion) LS.

	TYPE	UNIT	QUANTITY	MINIMUM	LIKELIEST	MAXIMUM
BRIDGE REMOVAL						

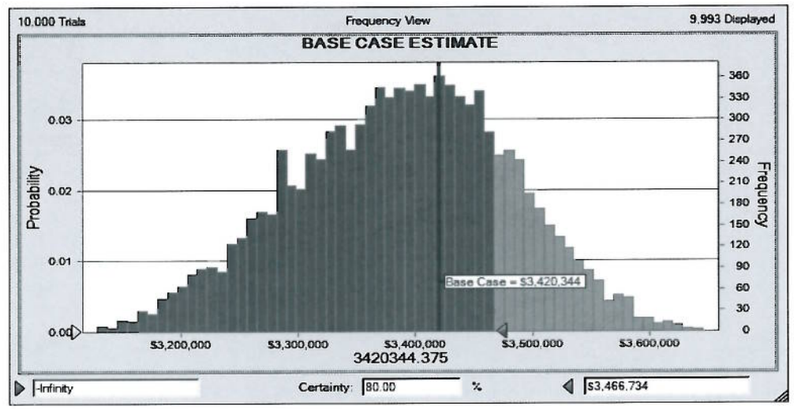
NCLUDES TRO, MOBILIZATION AND CONTINGENCY

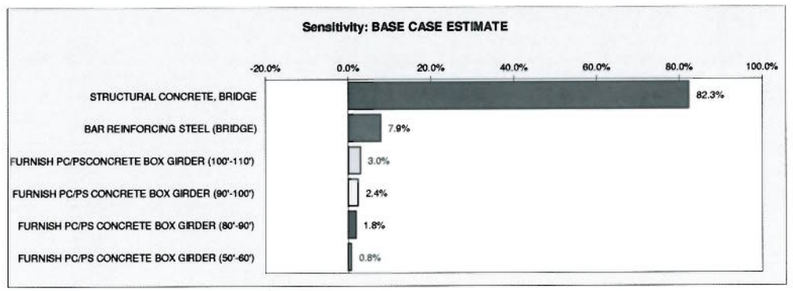
Notes
Highlighted cells represent the quantities and prices that are included in the model.
Base Case Estimate is the sum of the Quantity multplied by "Likeliest" Item Price

BASELINE ESTIMATE TO ASSUMED MIDPOINT OF CONSTRUCTION	
BASE CASE ESTIMATE	$3,420,344

OUTPUT

The estimate ranges generated below were prepared using Crystal Ball software. Crystal Ball software automatically calculates and records the results of thousands of different "what if" cases. Analysis of these scenarios reveals to you the range of possible outcomes, their probability of occurring, the inputs that most impact your model, and where you should focus your efforts.





Percentiles:	Forecast values	
0%	$3,091,205	
10%	$3,262,143	
20%	$3,304,900	
30%	$3,337,056	
40%	$3,366,366	
50%	$3,391,091	
60%	$3,415,655	
70%	$3,439,752	Recommended Range
80%	$3,466,734	
90%	$3,502,829	
100%	$3,645,016	

BASED ON THE ASSUMPTIONS USED TO CREATE THE MODEL, THE DES-STRUCTURE OFFICE ENGINEER RECOMMENDS THAT THE PROGRAMMING LEVEL BUDGET FOR THIS PROJECT BE DESIGNATED AT THE 80% FORECAST VALUE.

80% FORECAST VALUE = $3,467,000.00

***80% Forecast Value Escalated Budget Estimate to Assumed Midpoint of Construction**

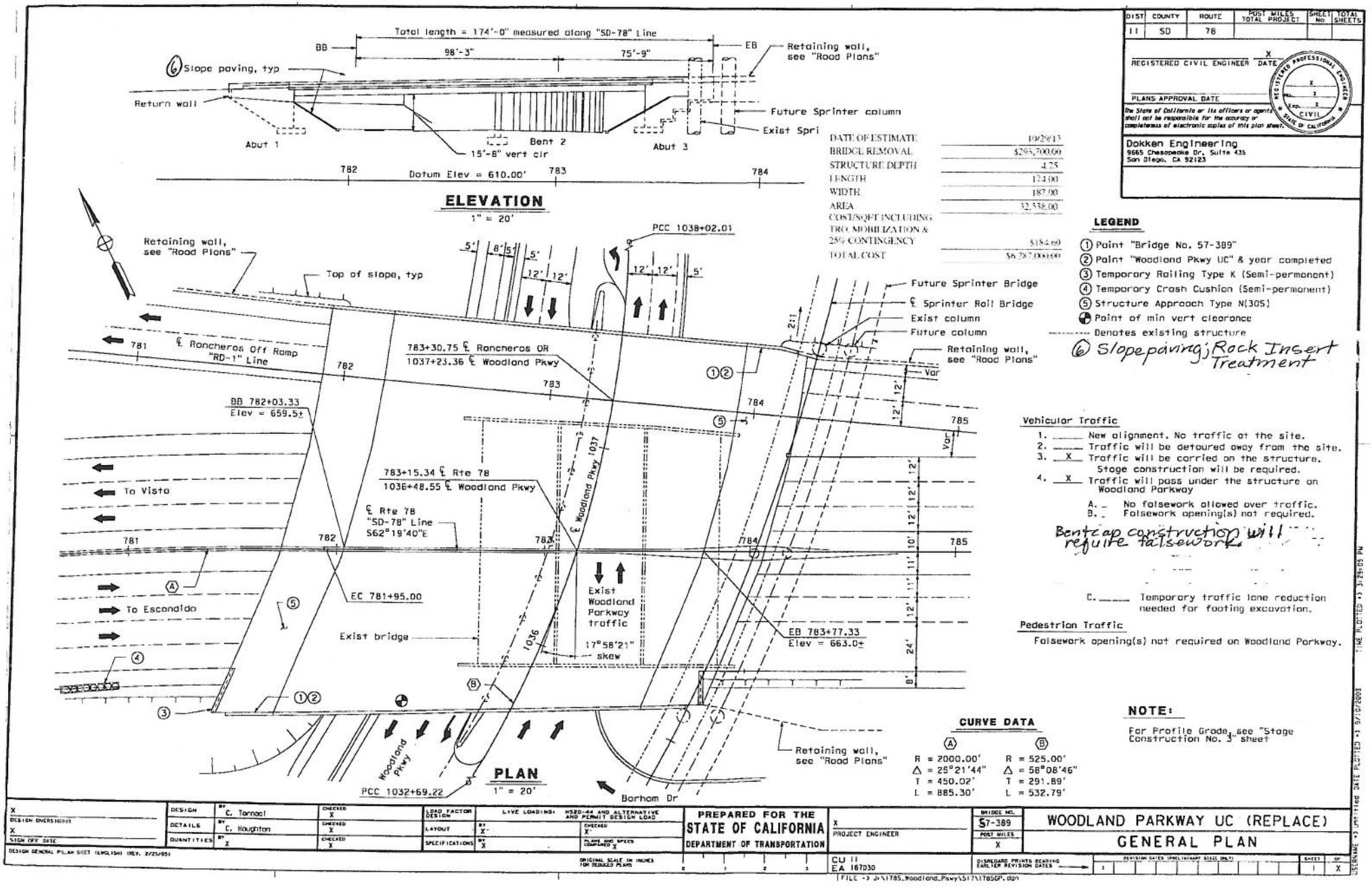
Years Beyond Midpoint	Escalation Rate	Escalated Budget Est.
1	0.30%	$3,477,000
2	1.40%	$3,526,000
3	2.50%	$3,614,000
4	2.90%	$3,719,000
5	2.50%	$3,812,000

* Escalated structure cost is provided for information only, actual construction costs may vary. Escalated structure costs provided do not replace Departmental policy to update cost estimates annually. Escalation rates used are based on Global Insight data posted at http://www.dot.ca.gov/hq/oppd/costest/data.htm. Web page updated April 2011.

80 % Forecast		3,467,000
BRIDGE COST PER SQUARE FOOT	=	$321
BRIDGE REMOVAL	=	

Bridge Cost per Square Foot and/or Bridge Removal costs modeled independently. Their 80% Forecast Values Provided for informational purposes only.

EXHIBIT 8



DATE OF ESTIMATE	10/29/13
BRIDGE REMOVAL	$295,700.00
STRUCTURE DEPTH	4.75
LENGTH	174.00
WIDTH	187.00
AREA	32,538.00
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$184.60
TOTAL COST	$6,287,000.00

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	78			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER X No. X Exp. X CIVIL STATE OF CALIFORNIA

Dokken Engineering
9665 Chesapeake Dr, Suite 435
San Diego, CA 92123

LEGEND

1. Point "Bridge No. 57-389"
2. Point "Woodland Pkwy UC" & year completed
3. Temporary Railing Type K (Semi-permanent)
4. Temporary Crash Cushion (Semi-permanent)
5. Structure Approach Type N(30S)
6. Point of min vert clearance
- Denotes existing structure

6 Slopepaving; Rock Insert Treatment

Vehicular Traffic

1. ____ New alignment. No traffic at the site.
2. ____ Traffic will be detoured away from the site.
3. X Traffic will be carried on the structure. Stage construction will be required.
4. X Traffic will pass under the structure on Woodland Parkway

A. ___ No falsework allowed over traffic.
B. ___ Falsework opening(s) not required.

Bentcap construction will require falsework.

C. ____ Temporary traffic lane reduction needed for footing excavation.

Pedestrian Traffic

Falsework opening(s) not required on Woodland Parkway.

CURVE DATA

(A)	(B)
R = 2000.00'	R = 525.00'
Δ = 25°21'44"	Δ = 58°08'46"
T = 450.02'	T = 291.89'
L = 885.30'	L = 532.79'

NOTE:

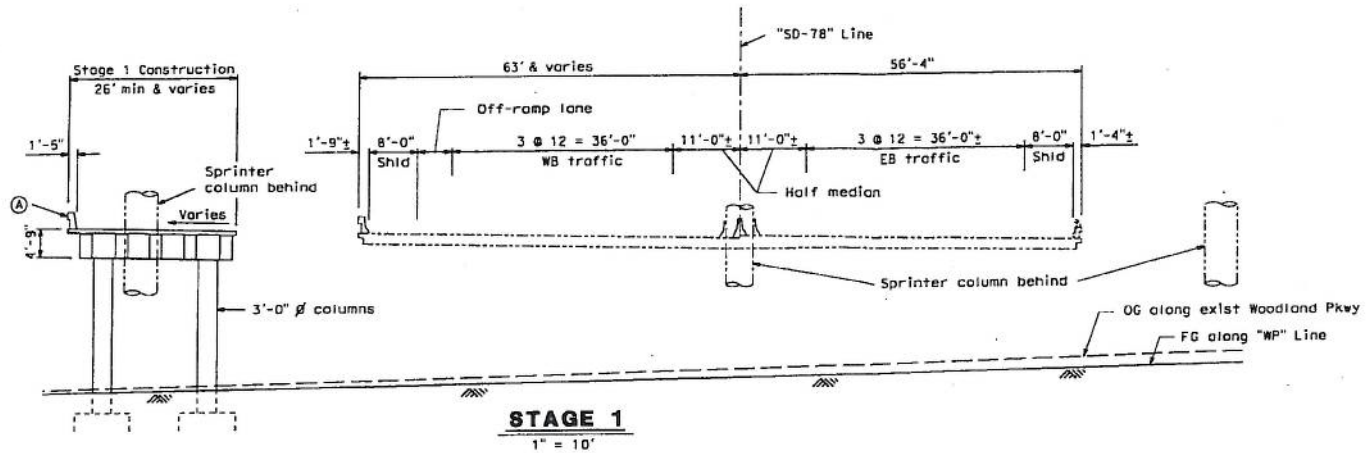
For Profile Grade, see "Stage Construction No. 3" sheet

X DESIGN OVERSIGHT / X SIGN OFF DATE	DESIGN	BY C. Tornaci	CHECKED X	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 57-389
	DETAILS	BY C. Houghton	CHECKED X	LAYOUT	CHECKED X		POST MILES X
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	PLANS AND SPECS COMPARED X	X PROJECT ENGINEER	WOODLAND PARKWAY UC (REPLACE)
DESIGN GENERAL PLAN SHEET (ENGLISH) (REV. 2/23/05)				ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3		CU 11 EA 167030	GENERAL PLAN
						DISREGARD PRINTS BEARING EARLIER REVISION DATES →	REVISION DATES (PRELIMINARY STAGE ONLY) 1

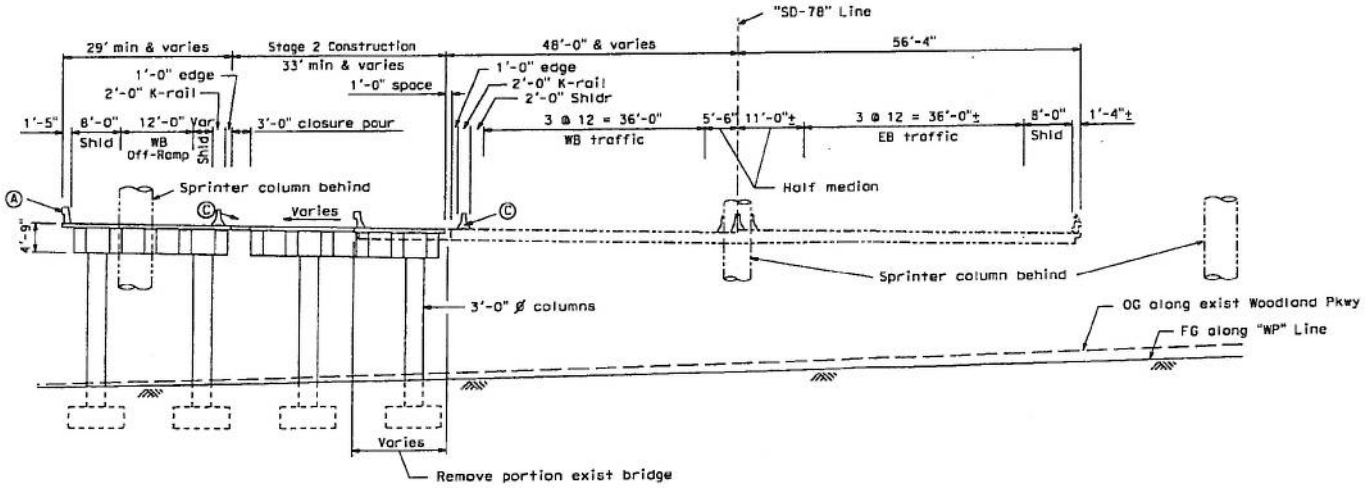
FILE -> J:\11785_Woodland_Pkwy\S1711785GP.dgn

USERNAME -> Last Revised DATE PLOTTED -> 5/6/2009 TIME PLOTTED -> 3:29:05 PM

EXHIBIT 8



STAGE 1
1" = 10'



STAGE 2
1" = 10'

DIST	COUNTY	ROUTE	TOTAL PROJECT	NO	SHEETS
11	SD	78			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

LEGEND

- Denotes existing structure
- Denotes existing structure (to be removed)
- Ⓐ Concrete Barrier Type 736
- Ⓒ Temporary Railing Type K

X DESIGN OVERSIGHT		DESIGN	BY C. Tornaci	CHECKED X	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
X SIGN OFF DATE		DETAILS	BY C. Houghton	CHECKED X	X PROJECT ENGINEER
DESIGN DETAIL SHEET (ENGLISH) REV. 2/25/05		QUANTITIES	BY X	CHECKED X	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

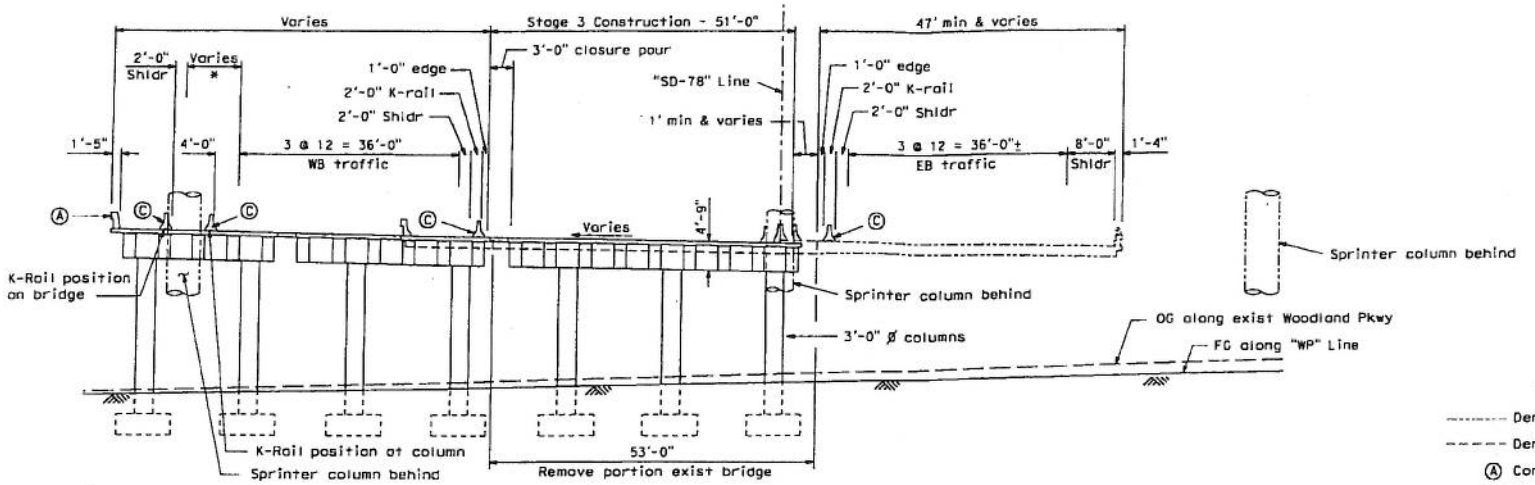
BRIDGE NO. 57-389
POST MILE X
CU 11
EA 187030
FILE -5 #REQUEST
STANDARD PRINTS BEARING EARLIER REVISION DATES →

WOODLAND PARKWAY UC (REPLACE)
STAGE CONSTRUCTION NO. 1

REVISION DATES (PRELIMINARY STAGE ONLY)

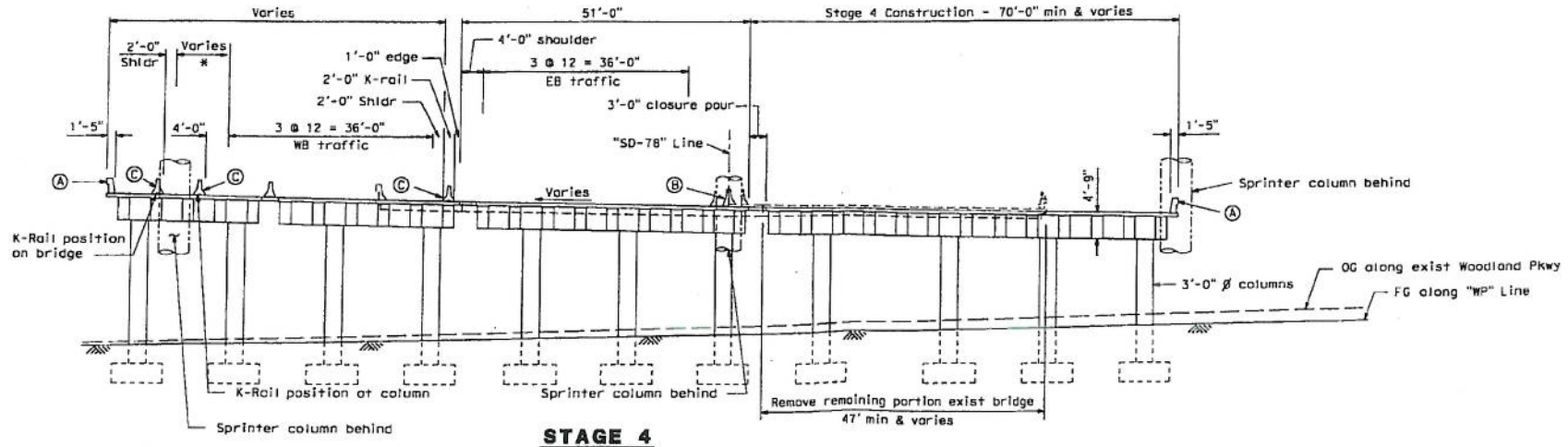
SHEET X OF X

EXHIBIT 8



STAGE 3

1" = 10'



STAGE 4

1" = 10'

LEGEND

- Denotes existing structure
- Denotes existing structure (to be removed)
- Ⓐ Concrete Barrier Type 736
- Ⓑ Concrete Barrier Type 60
- Ⓒ Temporary Railing Type K

DIST	COUNTY	ROUTE	TOTAL PROJECT	NO	SHEETS
11	SD	78			

REGISTERED CIVIL ENGINEER — DATE

PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

DESIGN OVERSIGHT

SIGN OFF DATE

DESIGN DETAIL SHEET (ENGLISH) (REV. 2/25/05)

	BY	CHECKED
DESIGN	C. Tornoe	X
DETAILS	C. Houghton	X
QUANTITIES	X	X

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS: 0 1 2 3

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER

CU 11
EA 187030
FILE -> REQUEST

BRIDGE NO. 57-389
POST MILE X

WOODLAND PARKWAY UC (REPLACE)
STAGE CONSTRUCTION NO. 2

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET	OF
X	X

EXHIBIT 8

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	78			

REGISTERED CIVIL ENGINEER _____ DATE _____

PLANS APPROVAL DATE _____

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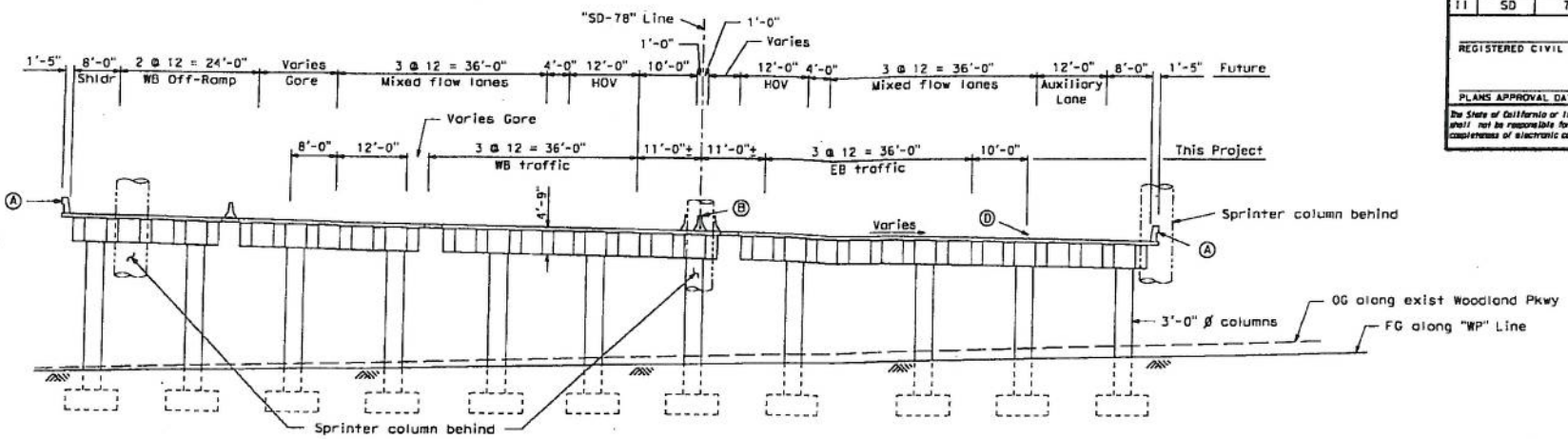
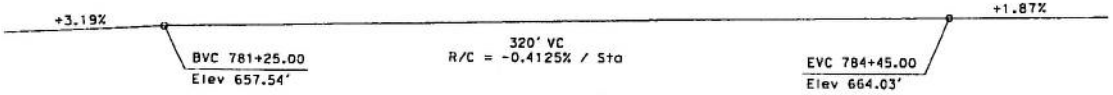


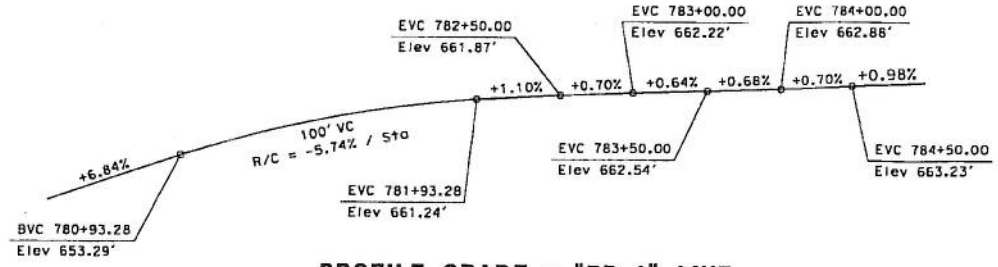
COMPLETED

1" = 10'



PROFILE GRADE - "SD-78" LINE

No Scale



PROFILE GRADE - "RD-1" LINE

No Scale

LEGEND

-------- Denotes existing structure

Ⓐ Concrete Barrier Type 736

Ⓑ Concrete Barrier Type 60

Ⓒ Temporary Railing Type K

Ⓓ Temporary Railing Type K (Semi-permanent)

DESIGN OVERSIGHT X		DESIGN	BY C. Tarnacl	CHECKED X	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DESIGN OFF DATE X		DETAILS	BY C. Houghton	CHECKED X	
DESIGN DETAIL SHEET (ENGLISH) (REV. 2/25/05)		QUANTITIES	BY X	CHECKED X	

X PROJECT ENGINEER

BRIDGE NO. 57-389

POST MILE X

WOODLAND PARKWAY UC (REPLACE)

STAGE CONSTRUCTION NO. 3

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 11
EA 187030

FILE => @REQUEST

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET X OF X

EXHIBIT 8

PROBABILISTIC STRUCTURE COST ESTIMATE

[ ] GENERAL PLAN ESTIMATE [X] ADVANCE PLANNING ESTIMATE

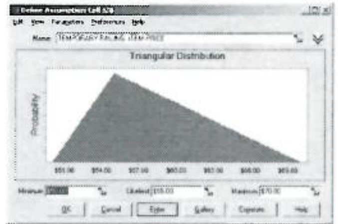
Revised August 28, 2013

IN EST:	10/7/2013
OUT EST:	10/29/2013

BRIDGE NAME:	WOODLAND PARKWAY UC (Replace)
BRIDGE NUMBER:	57-0389
TYPE:	PC/PS RECTANGULAR GIRDER
CU:	11
EA:	2T241K
PROJECT ID:	1112000152
DESIGN SECTION:	10
# OF STRUCTURES IN PROJECT :	17
PRICES BY :	TNC
PRICES CHECKED BY :	
QUANTITIES BY:	Tracy Sanderson

DISTRICT:	11
CO:	SD
RTE:	78
PM:	15.00
DEPTH	4.75
LENGTH	174
WIDTH	187
AREA	32,538
EST. NO.	1
COST INDEX:	389
DATE:	
DATE:	9/23/2013

INPUT



The Assumption Curves, unless noted otherwise, are modeled with a triangular distribution with the "Minimum, Likeliest and Maximum values."

	CONTRACT ITEMS	TYPE	UNIT	QUANTITY	ITEM PRICE RANGE MINIMUM	LIKELIEST	MAXIMUM	AMOUNT
1	TEMPORARY RAILING (TYPE K)		LF	[illegible]				
2	TEMPORARY RAILING (TYPE K) (SEMI-PERMANENT)		LF	[illegible]				
3	TEMPORARY CRASH CUSHION MODULE (SEMI-PERMANENT)		EA	[illegible]				
4	STRUCTURE EXCAVATION (BRIDGE)		CY	1,027	$32.00	$38.00	$45.00	$39,026
5	STRUCTURE BACKFILL (BRIDGE)		CY	1,080	$60.00	$66.00	$75.00	$71,280
6	FURNISH PILING (CLASS 90-45)		LF	3,720	$30.00	$35.00	$40.00	$130,200
7	DRIVE PILES (CLASS 90-45)		EA	215	$1,000.00	$1,200.00	$1,500.00	$258,000
8	STRUCTURAL CONCRETE, BRIDGE FOOTING		CY	251	$350.00	$385.00	$440.00	$96,635
9	STRUCTURAL CONCRETE, BRIDGE		CY	1,420	$500.00	$650.00	$750.00	$923,000
10	STRUCTURAL CONCRETE, APPROACH SLAB TYPEN(30 S)		CY	450	$700.00	$720.00	$740.00	$324,000
11	BAR REINFORCING STEEL (BRIDGE)		LB	123,000	$0.95	$1.10	$1.20	$135,300
12	SLOPE PAVING (CONCRETE) with Rock Insert Treatment		CY	183	$500.00	$575.00	$650.00	$105,225
13	CONCRETE BARRIER (TYPE 60)		LF	210	$200.00	$275.00	$325.00	$57,750
14	CONCRETE BARRIER TYPE 736		LF	380	$100.00	$110.00	$120.00	$41,800
15	FURNISH PC/PS RECTANGULAR GIRDERS (70'-80')		EA	33	$16,000.00	$20,000.00	$23,000.00	$660,000
16	FURNISH PC/PS RECTANGULAR GIRDERS (90'-100')		EA	33	$20,000.00	$26,000.00	$29,500.00	$858,000
17	ERECT PC/PS CONCRETE GIRDERS		EA	66	$3,500.00	$5,500.00	$7,000.00	$363,000
18	JOINT SEAL (MR = 1") 2" max		LF	374	$35.00	$38.00	$42.00	$14,212
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
							SUBTOTAL	$4,077,428
			TIME RELATED OVERHEAD			5%		$203,871
			MOBILIZATION			10%		$475,700
			SUBTOTAL BRIDGE ITEMS					$4,756,999
			CONTINGENCIES			25%		$1,189,250
							SUBTOTAL	$5,946,249

Comments

Temporary Railing and crash cushion are District items

	TYPE	UNIT	QUANTITY	MINIMUM	LIKELIEST	MAXIMUM
BRIDGE REMOVAL			13,677	$12.00	$14.00	$16.00

BRIDGE REMOVAL LUMP SUM PRICE INCLUDES TRO, MOBILIZATION AND CONTINGENCY — $279,239

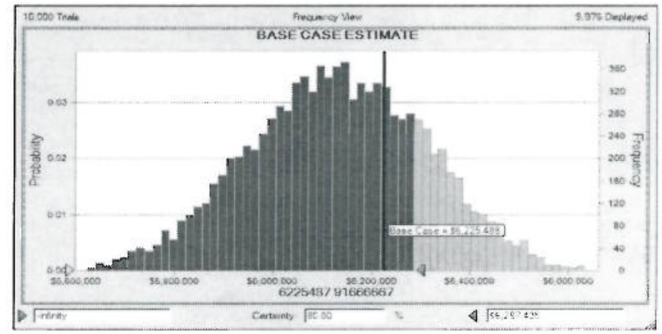
Notes

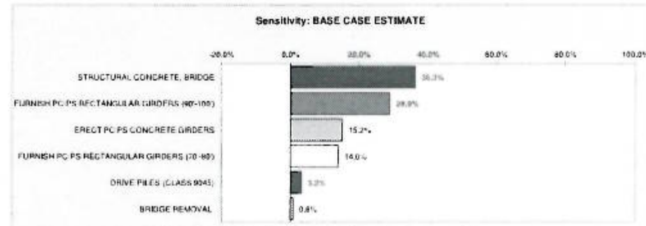
Highlighted cells represent the quantities and prices that are included in the model.
Base Case Estimate is the sum of the Quantity multplied by "Likeliest" Item Price

BASELINE ESTIMATE TO ASSUMED MIDPOINT OF CONSTRUCTION
BASE CASE ESTIMATE $6,225,488

OUTPUT

The estimate ranges generated below were prepared using Crystal Ball software. Crystal Ball software automatically calculates and records the results of thousands of different "what if" cases. Analysis of these scenarios reveals to you the range of possible outcomes, their probability of occurring, the inputs that most impact your model, and where you should focus your efforts.





Percentiles	Forecast values
0%	$5,482,956
10%	$5,893,053
20%	$5,972,945
30%	$6,033,518
40%	$6,084,073
50%	$6,128,837
60%	$6,178,420
70%	$6,229,274
80%	$6,287,435
90%	$6,360,049
100%	$6,716,168

Recommended Range: 70%–90%

BASED ON THE ASSUMPTIONS USED TO CREATE THE MODEL, THE DES-STRUCTURE OFFICE ENGINEER RECOMMENDS THAT THE PROGRAMMING LEVEL BUDGET FOR THIS PROJECT BE DESIGNATED AT THE 80% FORECAST VALUE.

80% FORECAST VALUE = $6,287,000.00

***80% Forecast Value Escalated Budget Estimate to Assumed Midpoint of Construction**

Years Beyond Midpoint	Escalation Rate	Escalated Budget Est.
1	0.30%	$6,306,000
2	1.40%	$6,394,000
3	2.50%	$6,554,000
4	2.90%	$6,744,000
5	2.50%	$6,913,000

* Escalated structure cost is provided for information only, actual construction costs may vary. Escalated structure costs provided do not replace Departmental policy to update cost estimates annually. Escalation rates used are based on Global Insight data posted at http://www.dot.ca.gov/hq/oppd/costest/data.htm. Web page updated April 2011.

80 % Forecast		6,287,000
BRIDGE COST PER SQUARE FOOT	=	$185
BRIDGE REMOVAL	=	$293,700

Bridge Cost per Square Foot and/or Bridge Removal costs modeled independently. Their 80% Forecast Values Provided for informational purposes only.

State of California Business, Transportation and Housing Agency

Memorandum

To : Omar Bendeck (MS 255)
Project Engineer
Advanced Planning

Date: October 3, 2014

File : 11-SD-15,78
PM R30.6/R32.0
PM 12.6/16.7
EA 11-2T240K
EFIS 1112000131

From : **DEPARTMENT OF TRANSPORTATION - DISTRICT 11**
ROADBED ENGINEERING SECTION

Subject: **STRUCTURAL SECTION RECOMMENDATIONS-UPDATE**

This memo is being reissued to reflect adjusted PM limits. All Structural Section recommendations remain valid.

In accordance with your request, Route 15/78 structural sections for HOV widening are submitted for your review. Calculations were based on a minimum design R-Value (Rv) of 5. The design Rv is typical of area soils.

Outside Lane

TI = 13.0 (20yr.)
Rv = 5

Alternative 1

0.65'HMA
1.95 AB-Class II
1.25 AS

Alternative 2

0.95' HMA
1.95' AB-Class II

Outside shoulder

TI = 8.0 (20yr.)
Rv = 5

Alternative 1

0.40'HMA
0.85' AB-Class II
0.70' AS

Alternative 2

0.40' HMA
1.50' AB-Class II

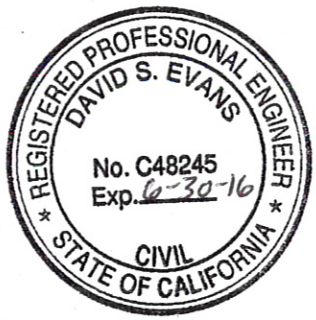
EXHIBIT 9

HMA is Asphalt Concrete (Type A) and meet aggregate grading requirements found in Section 39 of the 2010 Standard Specifications. PG 64-10 binder should be used in this climate region.

If you have questions with regards to this memorandum, contact J. Scandore at 858-467-4069 or D. Evans at 858-467-4056.

John Scandore
M & R Eng. Assoc.
Roadbed/Corrosion Section

David Evans
Assoc. Trans. Engineer (Reg.)
Pavement Section



Cc: A.Padilla

EXHIBIT 9

State of California **Business and Transportation Agency**

M E M O R A N D U M **REVISION**

'o: Karen Jewel, Project Manager

Attn: Rachel Mueller, Project Engineer

From: DEPARTMENT OF TRANSPORTATION - District 11 Right of Way

Date: January 8, 2015
File: 11-SD-15/78
P.M.: I-15: R30.6/R32.0
SR-78: 12.6/R16.7
E.A.: 2T240K
PID: 1112000131
Alternatives 1 & 2

Subject: RIGHT OF WAY DATA – HOV CONNECTORS

Programmed Amount: $ -0-

1. **R/W Cost Estimate:**

	Value Future Use	Escalation Rate	Escalated Value
A) Acquisition, including Excess Land, Fees, Damages, Goodwill, Mitigation	$ 5,367,220	3 %	$ 6,816,000
B) Railroad	$ 30,000	0 %	$ 30,000
C) Utility Relocation (State Share) + Potholing (Design Phase)	$ 11,932,750	3 %	$ 15,155,000
D) RAP and/or Last Resort Housing	$	0 %	$ 0
E) Clearance & Demolition	$ 0	0 %	$ 0
F) Title and Escrow Costs	$ 24,620	0 %	$ 25,000
G) Enviromental Permit Fees	1,000		1,000
Total R/W Estimate (Excluding Item #8 -Hazardous Waste)	**$ 17,355,590**	**Escalated**	**$ 22,027,000**

Condemnation Factor 10 %
Design Appreciation Factor 10 %
(Above two factors included in Acq. Escalation Rate)

Number of Years to Certification 9

2. **Parcel Data:**

	Type	Du. App	G/W App
X			
A	30		
B	19		
C			
D			
Total	49	Excess Parcels	

Utilities	
U4-1	
U4-2	
U4-3	
U4-4	11
U5-7	
U5-8	
U5-9	11

Railroad Involvements	
None	
C & M Agreements	1
Service Contracts	1
Lic/Re/Clauses	1
Misc R/W Work	
Rap Displacements	
Clearance/Demolitions	
Construction Permits	

Areas: R/W Fee: 189,188 Sq. Ft. Excess:
R/W Easements: (TCE) 76,083 Sq. Ft.

Entered PMCS 1. EVENT RW SCREEN (All Data) / /
2. AGRE SCREEN (Railroad Data Only) / /

.EMARKS: This Estimate was Revised to reflect the moving out of the project to 2024.

EXHIBIT 10

File: 11-SD-15/78
P.M.: I-15: R30.6/R32.0
SR-78: 12.6/R16.7
E.A.: 2T240K
Project ID: 1112000131

3. Are there major items of construction contract work?
Yes _____ No _____ Not determined at this time __X__ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **The land zones impacted are residential, commercial, industrial and unzoned.**

5. Is there an effect on assessed valuation?
Yes _____ No __X__ (If yes, explain.)

6. Are utility facilities or rights of way affected?
Yes __X__ No _____ Not determined at this time _____ (If yes, explain.) **SDG&E-gas, SDG&E-electric, AT&T, Sunesys, Level 3, Rincon Del Diablo Water, Qwest, SBC, Time Warner Cable, City of San Marcos, Valicitos Water District.**

7. Are railroad facilities or rights of way affected?
Yes __X__ No _____ (If yes, explain.) See Remarks, Page 1.

Name(s) of railroad(s) **NORTH COUNTY TRANSIT DISTRICT, SPRINTER**

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
Yes _____ No __X__ (If yes, explain.)

8. Were any previously unidentified sites with hazardous wastes and/or material found?
Yes _____ * None Evident __X__ (* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

9. Are RAP displacements required?
Yes _____ No __X__ (If yes, provide the following information.)

Number of single-family _____ Number of business/nonprofit _____
Number of multi-family _____ Number of farm _____

Based on Relocation Impact Statement/Study dated, it is anticipated that sufficient housing will be available without Last Resort Housing.

10. Are there any material borrow and/or disposal sites required?
Yes _____ No __X__ Not determined at this time ____ (If yes, explain.)

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

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

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.)
PYPSCAN lead time _____. Minimum Right of Way lead time requested from receipt of final maps to certification _____. [ ] See attached.

14. Is it anticipated that all Right of Way work would be performed by Caltrans staff?
Yes__X__ No _____ (If no, explain.)

File: 11-SD-15/78
P.M.: I-15: R30.6/R32.0
SR-78: 12.6/R16.7
E.A.: 2T240K
Project ID: 1112000131

ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[ ] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

[ ] Additional right of way requirements are anticipated, but are not defined due to preliminary nature of early design requirements.

[ ] See attached

Evaluations prepared by:

1. R/W Signature Andrew Bartlett — Andrew Bartlett — Date 1/8/2015

2. Railroad Signature Gwendolyn Denny — Gwendolyn Denny — Date 1/8/2015

3. Utilities Signature Roberto Gotay — Roberto Gotay — Date 01/08/15

4. Proj.Coord. Signature Carol Vu — Carol Vu — Date 1/8/2015

I have personally reviewed the R/W Data Sheet and 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.

By:

AMY LAMOTT VARGAS
Deputy District Director
Right of Way Division

LAURA FARAH, CHIEF
Project Coordination & Estimating Branch
Right of Way Division

TRANSPORTATION MANAGEMENT PLAN DATA SHEET
(Preliminary TMP Elements and Costs)

Co/Rte/KP SD/15,78/PM R30.6-R32.0, 12.6-R16.7 EA 2T240K(111200013 1) Alternative No. Rev 2

Project Limit In San Diego County In Escondido and San Marcos on Route 15 from 0.2 Mile South of Hale Avenue Undercrossing to Route 15/78 Separation and on State Route 78 from 0.1 Mile East of Twin Oaks Valley Road Overcrossing to Route 15/78 Separation.

Project Description HOV CONNECTORS

Expected Construction Schedule 2/2020

1) Public Information	
☒ a. Brochures and Mailers	$5,000
☒ b. Press Release	
☒ c. Paid Advertising	$6,000
☐ d. Public Information Center/Kiosk	$
☒ e. Public Meeting/Speakers Bureau	
☐ f. Telephone Hotline	
☒ g. Internet	
☒ h. Others Construction Bulletins	$12,500
2) Motorists Information Strategies	
☐ a. Changeable Message Signs (Fixed)	$
☒ b. Changeable Message Signs (Portable)	$20,000
☐ c. Ground Mounted Signs	$
☐ d. Highway Advisory Radio	$
☐ e. Caltrans Highway Information Network (CHIN)	
☐ f. Others	$
3) Incident Management	
☒ a. Construction Zone Enhanced Enforcement Program (COZEEP)	$520,000
☐ b. Freeway Service Patrol	$
☐ c. Traffic Management Team	
☐ d. Helicopter Surveillance	$
☐ e. Traffic Surveillance Stations (Loop Detector and CCTV)	$
☐ f. Others	$

4) Construction Strategies

- [x] a. Lane Closure Chart
- [ ] b. Reversible Lanes
- [ ] c. Total Facility Closure
- [ ] d. Contra Flow
- [ ] e. Truck Traffic Restrictions $ _____
- [ ] f. Reduced Speed Zone $ _____
- [x] g. Connector and Ramp Closures
- [ ] h. Incentive and Disincentive Clause $ _____
- [ ] i. Moveable Barrier $ _____
- [ ] j. Others _____ $ _____

5) Demand Management

- [ ] a. HOV Lanes/Ramps (New or Convert) $ _____
- [ ] b. Park and Ride Lots $ _____
- [ ] c. Rideshare Incentives $ _____
- [ ] d. Variable Work Hours
- [ ] e. Telecommute
- [ ] f. Ramp Metering (Temporary Installation) $ _____
- [ ] g. Ramp Metering (Modify Existing) $ _____
- [ ] h. Others _____ $ _____

6) Alternative Route Strategies

- [ ] a. Add Capacity to Freeway Connector $ _____
- [ ] b. Street Improvement (widening, traffic signal... etc) $ _____
- [ ] c. Traffic Control Officers $ _____
- [ ] d. Parking Restrictions
- [ ] e. Others _____ $ _____

7) Other Strategies

- [ ] a. Application of New Technology $ _____
- [ ] e. Others _____ $ _____

TOTAL ESTIMATED COST OF TMP ELEMENTS = $563,500

Project Notes:

Assumptions/ Comments:

1. Entire project will take approximately 260 working days to construct.

2. Current dollar values used. Inflation was not factored into the estimate.

3. Traffic Control/Maintain Traffic costs were not provided. Please consult with the OE or Construction office for this estimate.

4. Portable CMS specified for this project by this estimate are designated for congestion relief as outlined by DD-60. Portable CMS required for other purposes should be included under other specifications; cost per unit is now $5,000 with 4 units estimated to be needed.

5. The COZEEP specified for this project by this estimate is designated for congestion relief as outlined by DD-60. The COZEEP required for other purposes should be included under other specifications.

6. A costruction information meeting should be held a week or two after the start of the project. Mailers should be sent out for any day time and weekend full closures. For the Nordahl Bridge Project 11- 259804 the city of San Marcos provided the mailing data base for free. If the city grants Caltrans the same privilege for this project then the mailers cost would be greatly reduced. Notification should be sent well in advance to the area shopping centers. A meeting with Palomar Hospital may be needed. Notification will be sent to emergency services and the CA Trucking Association.

Note 1: All projects who's contract value is $5 million or more, and/or meet certain other criteria should be evaluated for applicability of A+B Bidding. Consult the OE for more details about A+B Bidding.

Note 2: As outlined in Deputy Directive 60, this TMP is a living document, subject to change as required by changing circumstances. If there is material change to the project scope which will affect the function or adequacy of the TMP, then changes to the TMP must be addressed. If traffic conditions at the project site demonstrate that TMP elements need to be adjusted to adequately address congestion, then the TMP shall be altered accordingly.

Note 3: Hospitals with emergency services and fire stations that may require access through work zones at all hours should be accommodated. Schools, major venues, shopping malls, and other heavily utilized areas should also be notified of construction activities that may impact their services.

PREPARED BY	Maryam Hashami (858) 467-3244	DATE	10/22/14
APPROVED BY	Foroud Khadem	DATE	10/22/14

PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT

1. Project Information

District	County	Route	PM	EA
11	SD	15/78	30.6-R32.0 /12.6-R16.7	2T240K
Project Title: Construct HOV Direct Connectors & Lanes				
Project Manager Karen Jewel			Phone # 619-688-6803	
Project Engineer Rachel Vidal Mueller			Phone # 619-688-3679	
Environmental Office Chief/Manager Olga Estrada			Phone # 619-688-0229	
PEAR Preparer Dennis Jung			Phone # 619-688-3139 x 2	

2. Project Description

Purpose and Need

This project proposes the construction of direct connector lanes between Interstate 15 (I-15) and State Route 78 (SR-78) for Managed Lane (ML)-vehicular traffic, which would utilize either the High Occupancy Vehicle (HOV) or Express Lanes lane management systems. This ML direct connector will interconnect the existing I-15 Express Lanes with the proposed future Managed Lane facility on SR-78 from the Twin Oaks Valley Road Overcrossing (OC) to the I-15 junction. Operational improvements within the project limits are also proposed. These improvements include auxiliary lane construction, bridge replacement, bridge widening, ramp relocations, and street realignments.

Purpose

The purpose of this project is to improve the overall movement of people and goods between the Interstate 15 (I-15) and Twin Oaks Valley Road) interchange on State Route 78 (SR-78) by implementing cost effective strategies while minimizing impacts to the surrounding communities. This is achieved through the reduction of travel times, improved highway operations and enhanced regional traffic circulation.

The project improvements are intended to increase capacity by adding lanes and widening the roadway. Additional improvements to adjacent roadways would improve operations, access to the freeway, and improved local circulation. The operational goals

of this project can be achieved by adding project features such as auxiliary lanes, ramp realignment, ramp relocation, and realignment/relocation of local streets and intersections.

The goals for this project include:

- Provide HOV system connectivity between the I-15 Express Lanes and the future proposed SR-78 managed lanes.
- Reduce congestion caused by I-15 Express Lanes traffic exiting the managed lane facility at the Citracado Parkway Intermediate Access Point that must weave through the general purpose lanes to access the I-15/SR-78 connector.
- Provide improved access for SR-78 HOV and/or FasTrak traffic to enter the I-15 Express Lanes.
- Reduce congestion on SR-78 general purpose lanes.
- Improve local access at the Woodland/Barham interchange to addresds recent and planned development in the City of San Marcos.

Need

Portions of the SR-78 freeway between I-5 and I-15 currently experience traffic congestion and delay at peak periods. There has been significant growth in population, employment, and housing in the jurisdictions adjacent to the SR-78 corridor and the northern section of I-15, which has contributed to an increase in commuter and commercial trips along both corridors. An increased number of traffic generators along the SR-78 corridor, such as schools, hospitals and both local and regional shopping and recreational activities have further contributed to traffic congestion. Currently, there are limited north/south and east/west arterial networks, which lack sufficient connectivity with SR-78, particularly along the section of SR-78 near I-15.

In 2013, traffic volumes for the peak hours range from approximately 5,000 to 6,500 vehicles along each of the SR-78 freeway segments between San Marcos Boulevard and the 15/78 Separation. Traffic volumes along I-15 from Auto Parkway to the 15/78 Separation range from approximately 4,000 to 8,900 vehicles during the peak hours. The increase in traffic generators along SR-78 and I-15 has contributed to heavy use of the north to west and east to south connectors at the 15/78 Separation. These two existing connectors are heavily utilized. Almost half of the total traffic volume on northbound I-15 transitions to westbound SR-78, and over 60% of the total traffic volume driving on eastbound SR-78 uses the I-15 southbound connector. It is anticipated that by this year the east to south connector will have reached its capacity of 4,000 vehicles per hour during the PM peak period. By year 2023, the north to west connector will have also reached its full capacity.

Segments of SR-78 experience higher levels of congestion during the peak hour periods due to insufficient capacity on the general purpose lanes and existing connectors and due to a lack of managed lane connectivity between the I-15 Express Lanes and SR-78. The Managed Lane concept is an operational practice utilized to address congestion by controlling movement on the highway. This project would implement one of two lane management strategies, HOV lane or express lane, to reduce the demand on the existing I-15/SR-78 connectors by providing dedicated lanes for managed lane traffic to transition between the I-15 Express Lanes and the proposed future SR-78 Managed Lane project.

In the westbound direction, the segment between Twin Oaks Valley Road and Nordahl Road currently operate at full capacity during peak hour periods. Three existing bottlenecks occur within this segment. At the Woodland Parkway off-ramp, insufficient storage capacity on the ramp and an unsignalized intersection create a queue of vehicles onto the main lanes. East of the Nordahl on-ramp, an existing auxiliary lane ends and traffic must merge into the adjacent general purpose lanes while on-ramp traffic is also entering the main lanes. Between the Nordahl Road off-ramp and the I-15 connectors, vehicles entering from the connectors must exit at the off-ramp or weave to get onto the SR-78 main lanes, and some vehicles traveling west on SR-78 from Escondido must weave through this same traffic to exit to the Nordahl Road off-ramp.

In the eastbound direction, the segment between Twin Oaks Valley Road and the Barham Drive/Woodland Parkway interchange would operate at full capacity by year 2040. Two existing bottlenecks occur between the segment from the Twin Oaks Valley Road on-ramp and the Nordahl off-ramp. At the Twin Oaks Valley Road on-ramp, ramp traffic must enter SR-78 on an auxiliary lane that ends just east of the existing SPRINTER structure that traverses the main lanes. The second bottleneck occurs at the Barham Drive on-ramp, which connects to the Nordahl Road off-ramp through an auxiliary lane. Traffic entering SR-78 from this ramp must weave through two lanes of traffic to access the general purpose lanes while main lane traffic is also weaving to exit at the Nordahl Road off-ramp.

The proposed connector, along with the proposed managed lanes, would reduce congestion on the existing general purpose connectors and allow them to operate under capacity beyond the forecasted year of 2020. Along with reducing congestion, this project would also enhance safety by minimizing the weaving that occurs as HOV and/or FasTrak vehicles transition between I-15 and SR-78 and by minimizing the amount of vehicles in the queue at the existing northbound and southbound I-15/SR-78 connectors. The proposed managed lane connector would allow HOV and/or FasTrak users to stay in the managed lanes as they transition between I-15 and SR-78.

The westerly project limits were set at the Twin Oaks Valley Road interchange to minimize the congestion that occurs along SR-78 between this interchange and I-15. A preliminary origin and destination study for yr 2040 indicated that approximately one-third of traffic traveling westbound on SR-78 would be exiting the facility within this segment. By providing managed lane connectivity between I-15 and SR-78, HOV and/or FasTrak users traveling beyond the project limits could avoid the weaving and queuing that occurs on the SR-78 main lanes as vehicles enter and exit the facility at Twin Oaks Valley Road, Woodland Parkway and Nordahl Road interchanges.

Existing Facilities

State Route 78 (SR-78) is the principal east-west route in the north county region of San Diego. This route serves interregional, intraregional, commuter and recreational travelers as well as interregional goods movement. In San Diego County, SR-78 traverses the cities of Oceanside, Vista, San Marcos, Escondido and a portion of San Diego. SR-78 also serves the communities of Ramona, Julian and provides a northerly extension to Borrego Springs. The western freeway portion of the route between Oceanside and Escondido is a major commuter route. The remainder of the route in San Diego County serves outlying rural communities and recreational areas, including the Cleveland National Forest, Cuyamaca Rancho State Park and Anza-Borrego State Park.

From Interstate 5 in Oceanside to Interstate 15 in Escondido, SR-78 is a six-lane freeway. The closest parallel state routes to SR-78 in San Diego County are SR-76, which varies between 2 and 15 miles to the north, and SR-56, which is 15 miles to the south.

SR-78 was added to the Freeway and Expressway System in 1959, is a part of the National Highway System (NHS), and is a designated route in the National Network of Surface Transportation Assistance Act (STAA), which is a route system federally designated for use by larger trucks. For maintenance programming purposes SR-78 located within the project limits has been classified as Maintenance Service Level (MLS) 2. The functional classification for SR-78, from I-5 to Centre City Parkway in Escondido, is listed as a Principal Arterial – Other Freeway or Expressway.

Interstate 15/State Route 15 (I-15/SR-15) is a principal north/south freeway serving the inland portion of San Diego County, providing movement of commuter, regional, and interregional traffic (For discussion purposes, I-15/SR-15 will be identified as I-15 for the rest of this report). I-15 serves as an interregional route for travel and goods movement by linking the San Diego metropolitan area with Mexico to the south, and the Riverside/San Bernardino area to the north, continuing in a northeasterly direction to Las Vegas. I-15 serves regional travel needs by serving the Cities of San Diego, San Marcos, Poway, Escondido, and the unincorporated communities of Bonsall, Fallbrook and

Rainbow. I-15 is a heavily utilized commuter route providing access to the growing residential communities of Tierrasanta, Mira Mesa, Scripps Ranch, Rancho Penasquitos, Sabre Springs, Carmel Mountain Ranch, Poway, Escondido, and Rancho Bernardo. This project is listed as the top priority among HOV Connector projects in the San Diego Association of Governments (SANDAG) 2050 Regional Transportation Plan (2050 RTP), with an estimated cost of $105 million, and is currently scheduled for construction by the year 2020.

The TransNet Extension Ordinance and Expenditure Plan listed the proposed managed lane connector under Interstate 15 improvements and provided a capital cost estimate of $200 million, which included $3 million for mitigation costs.

Description of Work

This project proposes the construction of direct connector lanes between Interstate 15 (I-15) and State Route 78 (SR-78) for Managed Lane (ML)-vehicular traffic, which would utilize either the High Occupancy Vehicle (HOV) or Express Lanes lane management systems. This ML direct connector would interconnect the existing I-15 Express Lanes with the proposed future Managed Lane facility on SR-78 from the Twin Oaks Valley Road Overcrossing (OC) to the I-15 junction. Operational improvements within the project limits are also proposed. These improvements include auxiliary lane construction, bridge replacement, bridge widening, ramp relocations, and street realignments.

The major project features of this project include the construction of a new two-lane wide direct connector structure between I-15 and SR-78, the widening of Mission Avenue Overhead (Mission OH) to the north, and the full replacement of the existing Woodland Parkway Undercrossing (Woodland UC). This project also includes widening of SR-78 along the existing median to the outside to accommodate a single managed lane, HOV or Express Lane, in each direction from Twin Oaks Valley Road and to just west of I-15.

Proposed Structures

I-15/SR-78 Managed Lane Connector (NEW)

The proposed I-15/SR-78 managed lane direct connector structure, which would serve both directions of travel, would begin in the existing center median of I-15 at the Hale Avenue UC, just north of the Hale Avenue Direct Access Ramp (DAR), and would connect to the existing lanes of the I-15 Express Lanes. The structure would rise in elevation in a northerly direction before curving towards the west to span the Sprinter light rail facility running west to east under I-15, Mission Avenue, the I-15 southbound lanes, an existing mitigation site, and the eastbound SR-78 main lanes. The connector would touch down in the existing median area of SR-78, west of the I-15/SR-78 Separation and nearly parallel to the westbound on-ramp from I-15. As part of this project, managed lanes along SR-78, one lane in each direction, would be constructed between Twin Oaks Valley Road and the new connector. This proposed cross section of this structure would accommodate two 12-foot lanes, standard 10-foot outside shoulders,

and 5-foot inside shoulders. A Type 60 concrete barrier would separate the opposing directions of travel, and Type 736 bridge railing would be used on the outside shoulders. The nominal width of the structure is 59 feet, and its proposed length of 3,287feet.

The structure would be constructed with cast in drilled hole (CIDH) piles that would be used to support the foundation. Cast in Place/Prestressed (CIP/PS) concrete box girders would be used to support the bridge deck. Mechanically Stabilized Earth (MSE) walls would be used for structure transitions to I-15 and SR-78.

The current cost for this direct connector is estimated at $38.1 million.

Mission Road Overhead: Bridge No. 57-0135 (Existing)

This existing overhead (OH) structure was originally built in 1962 as a Reinforced Concrete (RC) box girder bridge. It was first widened in 1990, and then again in 2013 on its southern edge (eastbound direction). It consists of four spans and uses RC open end seated abutments. The existing bridge length is 354 feet, and has a current width of approximately 143 feet.

This project proposes widening the westbound direction of the structure by 30 feet to accommodate one managed lane and one general purpose lane. There are two alternatives proposed for this widening. In the first alternative, CIDH concrete shafts with isolation casing would be used to support a CIP/PS concrete box girder. A second alternative proposes the use of a precast/prestressed (PC/PS) 4 foot x 4 foot concrete box girder, which has the advantage of constructing a thinner box girder to support the deck. This would increase the bridge's vertical clearance over Mission Road by up to 6 inches. The widening of this existing structure is necessary for the construction of the proposed managed lanes from Twin Oaks Valley Road to the 15/78 Separation, specifically in the westbound direction. If the managed lanes are only constructed to end just west of Nordahl Road interchange, there will not be enough width to provide adequate work areas and to maintain traffic during future construction.

The current cost of this structure widening is estimated at $3.6 million.

Woodland Parkway Undercrossing-Bridge No. 57-0389 (Replacement)

This undercrossing (UC) structure was originally built in 1962 as a Reinforced Concrete (RC) slab with closed end cellular abutments on columns and RC pier walls on spread footings. It was widened in 1990. At that time, the median abutment was built on concrete piles. Two existing lanes, one lane in each direction, carry traffic from Woodland Parkway to the north of SR-78 and to Barham Drive to the south of SR-78. The current span length of 43 feet is insufficient to accommodate future traffic volumes on SR-78 and Woodland Parkway.

The existing structure is to be demolished and replaced with an undercrossing structure that is 174 feet wide and 174 feet long. The new structure would be built with

precast/prestressed (PC/PS) rectangular girders and would be able to accommodate eight general purpose lanes and two managed lanes on SR-78. Woodland Parkway would be widened to four lanes, two lanes in each direction, with left turn lanes and a bicycle lane under the UC structure. The westbound ramps would also be realigned to reconnect the ramps to SR-78.

During construction, the proposed demolition of the existing structure and the new bridge replacement is to be phased over several construction stages to maintain traffic flow on SR-78. The phasing is needed to avoid impacting the Sprinter's light rail structure, which is located just east of the Woodland Parkway UC and which crosses over SR-78 in a northwesterly direction.

The current cost of this structure replacement is estimated at $6.3 million.

The City of San Marcos is at the design phase for the proposed Barham Drive/Woodland Parkway interchange and local street improvement project, which has a total estimated current cost of $35 million to $40 million. Improvements include the replacement of the existing Woodland Parkway Undercrossing, BR No. 57-389, the widening and realigning of local streets in the immediate interchange area, realigning the westbound and eastbound off-ramps, and signalizing ramp and local street intersections

.

Although the construction and structure cost of this bridge is anticipated to be covered by the proposed City of San Marcos Barham Drive/Woodland Parkway project, the cost has been included in this project's estimate in the event that City's project encounters issues that would delay or postpone this bridge replacement. This structure's replacement is an essential part of constructing the proposed managed lanes from the 15/78 Separation to Twin Oaks Valley Road. The local street widening and realignment improvements proposed for Rancheros Drive (east of the westbound off-ramp), Barham Drive and Woodland Parkway are not included in this project's estimate since these project features are not within the scope of this project.

State Route 78 Improvements

The proposed roadway improvements include roadway widening within the median and towards the outside of the SR-78 facility, realignment of ramps, ramp relocation, and realignment of local streets within the proposed roadway prism. Construction of these roadway improvements include activities such as clearing and grubbing, new pavement, new retaining walls, concrete channel modifications, utility relocations, irrigation line modifications, landscaping improvements, additional right-of-way (including construction and noise wall easements), and electrical modifications. Existing Caltrans facilities, within the project area, will be evaluated for possible rehabilitation, repair or replacement as part of this project.

The SR-78 roadway improvements for this project include the addition of two managed lanes, one lane in each direction. These lanes would be constructed along the existing median of SR-78 and will be run from the Twin Oaks Valley Road interchange to just

west of the I-15/SR-78 Separation, where each lane would connect to the proposed new I-15/SR-78 managed lane connector. Extending the lanes to Twin Oaks Valley Road would bypass those SR-78 segments with the highest traffic volumes and would allow for an unimpeded traffic flow pattern as the managed lane transitions to/from a general purpose lane. These two lanes serving opposing directions of travel would be separated from one another by the existing concrete median barrier and by standard inside shoulder widths. In each single direction, the managed lane would be separated from the general purpose lanes by providing a buffer separation. The typical cross section of the managed lane would be a 10-foot inside shoulder and a 12-foot lane. A 4-foot striped buffer would separate this lane from the general purpose lanes.

With one exception, all of the existing on- and off-ramps at the SR-78 interchanges of Twin Oaks Valley Road, Woodland Parkway/Barham Drive, and Nordahl Road would be realigned to reconnect with the widened roadway. The eastbound on-ramp from Barham Drive would be relocated from its current location, which is approximately one mile east of the Woodland Parkway UC, to its new location just east of the Woodland Parkway/Barham Drive eastbound off-ramp.

Operational improvements in both directions of SR-78 would handle traffic volumes forecasted for 2040 are included in this project. These improvements include the following:

- Extending the existing westbound (WB) auxiliary lane from Nordahl Road on-ramp to the Twin Oaks Valley off-ramp;
- An eastbound auxiliary lane between the Twin Oaks Valley Road on-ramp and the Woodland Parkway/Barham Drive off-ramp;
- An eastbound auxiliary lane between the Nordahl Road on-ramp and the existing I-15 southbound connector;
- A westbound auxiliary lane at the Nordahl Road on-ramp to the I-15 southbound connector, and
- An eastbound acceleration lane from the Mission Road to the Nordahl Road off-ramp.

Construction of the proposed direct connector, the two managed lanes along the median and operational improvements would require the SR-78 roadway to be widened approximately 25-40 feet to the outside in each direction. Several retaining walls would be needed to minimize impacts to local properties and streets.

During the Woodland Parkway/Barham Drive undercrossing replacement, a portion of Barham Drive would be realigned to accommodate the relocated eastbound Barham Drive on-ramp and improve local traffic circulation. Portions of Rancheros Drive and Carmel Street would also be realigned to accommodate the SR-78 roadway improvements.

Interstate 15 Improvements

The segment of I-15 Express Lanes within the project limits, incorporated additional widths in the median to facilitate the construction of the proposed two-lane managed connector. Although outside widening on I-15 is not currently proposed, subsequent and more in-depth geometric studies may determine that additional width on I-15 is needed.

Alternatives

The two build alternatives studied for this project are each based on the Managed Lane system management practice.

In California, the concept of a managed lane was first put into practice in 1962. Managed lanes, as defined in the 2011 Traffic Operations Policy Directive (TOPD) 11-02, are lanes that are proactively managed in response to changing conditions and are increasingly used nationwide to deal with congestion and limited resources. The strategic goals of a managed lane project are:

- Decrease congestion duration and reduce congested locations
- Increase person-throughput on a corridor by increasing vehicle occupancy, whether through carpooling, vanpooling, or transit
- Provide time savings that would provide incentives for HOV and FasTrak users to utilize the facility
- Decrease per-person air quality impacts
- Increase predictability of travel by reducing variations in delay
- For Express Lanes, generate revenue for corridor transportation improvements that include transit and closing gaps in the managed lane network.

The term "managed lane," in this document, refers to two lane management strategies listed in TOPD 11-02: high occupancy vehicles (HOV) and express lanes, which refers to either high occupancy/toll (HOT) lanes or express toll lanes.

The two lane management strategies studied as build alternatives for this proposed I-15/SR-78 connector project are HOV lanes and HOT lanes, which will, from this point on, be referred to as "Express Lanes" in this report to avoid potential confusion between the HOV and HOT acronyms.

A No Build alternative was also considered as a part of this project.

A summary of the three alternatives is shown in the following table.

Alternative Comparison Summary

	Alternative 1 HOV Only	Alternative 2 Express Lanes	No Build
Pros:			
Provides HOV Only connectivity between the existing I-15 Express Lanes facility and the proposed future managed lanes facilities on I-5 and SR-78	✓	✓	
Encourages ridesharing	✓	✓	
Increases person-throughput on a facility	✓	✓	
Lessen demand on the general purpose lanes	✓	✓	
Mass transit use is promoted	✓	✓	
HOVs are not required to pay a fee to use the facility	✓	✓	
FasTrak users can access the system by electing to pay a fee.		✓	
Available unused capacity is utilized by FasTrak users		✓	
Ability to utilize other lane management strategies by using pricing equipment installed during construction.		✓	
Generates revenue through a pricing scheme.		✓	
Cons:			
Excess available capacity is underutilized.	✓		
FasTrak vehicles traveling NB on I-15 Express Lanes must exit the facility to travel to WB SR-78	✓		
As traffic demand changes, future use of other managed lane strategies, such as Express Lanes or Express Tolling, would require installation of equipment and signage.	✓		

For the two build alternatives, the proposed roadway and structure geometry is identical, which establishes this project's preliminary footprint for future engineering and environmental studies that will occur in the next project phase.

Alternative 1: High Occupancy Vehicle (HOV) Lanes

For Alternative 1, vehicle occupancy is the lane management strategy utilized to provide connectivity for managed lane traffic between the Interstate 15 (I-15) Express Lanes to the future proposed managed lanes facility along State Route 78 (SR-78) between Interstate 5 (I-5) and I-15. Sometimes referred to as a carpool lane, HOV lanes are a special lane reserved for the use of carpools, vanpools and buses, which allow these higher occupancy vehicles to bypass lower occupancy traffic in the adjacent, unrestricted "general purpose" lanes.

HOV traffic, with a minimum occupancy of two or more people, would be allowed to utilize the proposed I-15/SR-78 managed lane connector structure to travel between the I-15 Express lanes and the future SR-78 managed lanes, without having to exit the managed lanes and access the existing connectors, which are operating near congestion levels during peak hours. Mass transit, motorcycles and other vehicles approved by California state law are also granted access to the proposed connector. All other vehicles must use the general purpose lanes and existing connectors of the I-15/SR-78 Separation.

This alternative would require a new two lane connector structure, one lane for each freeway to freeway movement, to be constructed between I-15 and SR-78. The proposed structure would be built just north of the Hale Direct Access Ramp and would connect to SR-78 just east of the SR-78/Nordahl Road interchange and west of the I-15/SR-78 Separation. Additional signage and striping would be required along both I-15 and SR-78.

Alternative 2: Express (HOT) Lanes

For Alternative 2, vehicle occupancy and value (congestion) pricing are the lane management strategies utilized to provide connectivity for managed lane traffic between the I-15 Express Lanes to the future proposed managed lanes along SR-78 between I-5 and I-15. Value pricing is a management tool where the cost to use a managed lane facility is varied during certain time periods in order to managed the demand on the facility. Examples of value pricing include peak-period surcharges or off-peak discounts.

In addition to HOV traffic, this express lanes alternative would allow vehicles with lower occupancy than the minimum needed for HOV eligibility to utilize the proposed I-15/SR-78 managed lane connector structure to travel between the I-15 Express lanes and the future SR-78 managed lanes by paying a fee that is adjusted based on the demand on the managed lanes to keep these lanes free-flowing or at a predetermined acceptable level of service (LOS).

Northbound I-15 Express Lanes traffic traveling to westbound SR-78 would not have to exit the managed lanes facility and will have continuous path to the proposed future SR-78 managed lanes facility, which is being studied as a separate project. Eligible eastbound SR-78 traffic will also have a continuous route to the I-15 Express Lanes facility. Mass transit, motorcycles and other vehicles approved by California state law are also granted access to the proposed connector.

By allowing vehicles equipped with FasTrak transponders to pay a fee to access the managed lane facility, any unused available capacity within the system would be fully utilized. When HOV demand is low, prices are adjusted to encourage these vehicles to use the system. When HOV demand is high, prices are readjusted to maintain free-flow conditions and/or other predetermined operational goals by discouraging FasTrak vehicles from entering the facility during these high capacity periods.

This alternative would require a new two lane connector structure, one lane for each freeway to freeway movement, to be constructed between I-15 and SR-78. The proposed structure would be built just north of the Hale Direct Access Ramp and would connect to SR-78 just east of the SR-78/Nordahl Road interchange and west of the I-15/SR-78 Separation. Additional signage and buffer striping would be required along both I-15 and SR-78. New managed lane pricing equipment would be needed along the proposed express lanes connector and along the proposed SR-78 managed lanes.

No Build Alternative

A No Build alternative was considered for this project but eliminated since current and future traffic deficiencies would not be addressed and it and would not meet the purpose and need of the project. This alternative would not meet the goals of SANDAG's 2050 Regional Transportation Plan (RTP) or of the TransNet Extension and Ordinance. Regional connectivity between the current managed lanes facility along I-15 and future managed lanes facilities proposed for I-5 and SR-78 would not be provided.

Alternatives Considered But Rejected

SANDAG's 2050 RTP is formulated to encourage alternative modes of transportation such as carpooling and mass transit. Voters approved the TransNet Extension and Ordinance in 2004, which includes a funding allocation for the construction a managed lane connector. These alternatives below would not improve the HOV system connectivity between the I-15 and SR 78. No further design studies or other future studies would be required. Preliminary design studies have been performed on these alternatives..

Rejected--Widen Existing I-15/SR-78 Connectors

This alternative would require major reconstruction of the existing I-15/SR-78 Separation connectors to widen the NB15/WB78 connector and the EB78/SB15 connector. To accomplish the widening of these two existing connectors, these proposed structures

would be constructed within a tightly constrained footprint due to the existing adjacent structures and roadways that comprise the remainder of the I-15/SR-78 Separation. Additional widening to both sides of I-15, south of the Separation, and to both directions of SR-78 would be needed to realign traffic with the widened connectors. Construction staging activities would cause significant impacts and delays to traffic along both the I-15 and SR-78 roadways.

Widening the existing connectors would add capacity, which would lessen the congestion on each of the connectors, but it would not address the weaving movements through the general purpose lanes from traffic that utilize the I-15 Express Lanes. Future connectivity between the I-15 Express Lanes and the future SR-78 managed lanes between I-5 and I-15 would not be provided. This alternative would exceed the total project costs of the other proposed alternatives, and right of way and environmental impacts would increase.

Rejected--Operational Improvements Only

This alternative would construct only operational improvements along SR-78. These improvements may improve traffic operations in isolated point locations or segments, but as a whole they would not address the need and purpose of this project to minimize congestion on the existing I-15/SR-78 connectors and to provide future connectivity between the I-15 Express Lanes and the future SR-78 managed lanes between I-5 and I-15.

Rejected—Convert Existing Connector Lanes to a Managed Lane

This alternative would convert one of the two lanes along each connector structure to a managed lane. Changing the lane configuration on the connectors to one managed lane and one general purpose lane would create longer queues during the peak hours as the capacity for general purpose vehicles is decreased. Longer queues would impact the operation on both I-15 and SR-78 roadways as queued traffic blocks ramp and/or through movements along both facilities. Traffic that uses the I-15 Express Lanes would continue to weave through the I-15 general purpose lanes to enter or exit the existing managed lane facility. In order for this alternative to function properly, the converted managed lanes would need to connect directly to the I-15 Express Lanes, which would require major reconstruction.

The need and purpose of this project would not be fulfilled because this alternative would decrease capacity on the existing connectors and increase congestion, delays and queues. Future connectivity between the I-15 Express Lanes and the future SR-78 managed lanes between I-5 and I-15 would not be provided.

Rejected—Express Toll Lanes

This alternative would construct a tolled managed lane connector between the I-15 Express Lanes and the future proposed managed lanes on SR-78. All HOV and FasTrak vehicles, excluding transit, would be charged a fee to use the connector. Vehicles that are traveling northbound on the I-15 Express Lanes would need to make a decision before reaching Citracado Parkway to remain on the facility and pay the pricing fee at the proposed connector or to exit at the existing IAP to utilize the existing connector to SR-78. In the eastbound SR-78 direction, traffic wanting to connect to southbound I-15 would also need to use the existing southbound I-15 connector or choose to pay the pricing fee.

Although future connectivity would be provided, full capacity on the proposed connector would not be reached with this alternative, as most drivers would most likely elect to use the existing I-15/SR-78 connectors.

3. *Anticipated Environmental Approval*

CEQA		NEPA	
Environmental Determination			
Statutory Exemption	☐		
Categorical Exemption	☐	Categorical Exclusion	☐
Environmental Document			
Initial Study or Focused Initial Study with proposed Negative Declaration (ND) or Mitigated ND	☒	Routine Environmental Assessment with proposed Finding of No Significant Impact Complex Environmental Assessment with proposed Finding of No Significant Impact	☒ ☐
Environmental Impact Report	☐	Environmental Impact Statement	☐
CEQA Lead Agency (if determined):		Caltrans	
Estimated length of time (months) to obtain environmental approval:		30 months	
Estimated person hours to complete identified tasks:		11,090	

4. *Special Environmental Considerations*

For all viable alternatives, no special environmental considerations are anticipated at this time.

5. Anticipated Environmental Commitments

A Visual Impact Assessment (VIA) consistent with FHWA guidelines will be completed that includes avoidance/or minimization measures for the following features: HOV flyover connectors, retaining and sound walls, concrete barriers and gore paving. Design features such as preferred material type, textures and hue for individual features will be recommended.

Any graded areas within the project limits must be seeded with an appropriate native erosion control mix. Specific native seed mixes will be recommended for bioswales, detention basins, and their associated slopes. Any native trees, including oaks, removed will be replaced. Any vegetation clearing including tree removal will be limited to a time of year that is outside the breeding season to avoid impacts to nesting birds. Temporary or permanent automatic irrigation systems will be installed to sustain the health and integrity of the replacement plant material. A three year plant establishment period will be funded as part of the project.

North of the proposed alignment there are 5 single family houses built in 1967 that are in an area that is zoned commercial. Regardless of this they are 'Grandfathered In,' as legal residences and their backyards can be legally considered as frequent outdoor human use areas of single-family residential dwellings. As such, they need to be evaluated for noise issues. The noise study includes short-term and long-term noise measurements, roadway traffic noise modeling using Federal High Administration's (FHWA) Traffic Noise Model (TNM), and traffic noise impact analysis. The estimated cost for this study is $189,720 and will take approximately 1,860 hours to complete. The cost of abatement for a 106,200 square foot masonry block wall is estimated to be $2.66 million. Total cost of the noise study and abatement is estimated to be $2.85 million.

These preliminary Environmental Commitments are preliminary. Additional mitigation measures may be determined during detailed environmental studies.

6. Permits and Approvals

After review of the project plans, biological memo, and project mapping it was determined that permits will be required for this project. Impacts may occur to Waters of the U.S. and to Waters of the State which will require a Section 401 from the Regional Water Quality Control Board and a Section 404 from the Army Corps of Engineers. If the riparian area and the jurisdictional waters of the state and federal government that flow into Escondido Creek and will be impacted this work will require a 1602, Streambed Alteration Agreement. Any wetland impacts will require mitigation which would increase costs for a Section 404 permit.

Permits: Permits can take anywhere from 3 to 9 months to obtain. The costs are based on the project cost for a 1602 and cut/fill for a Section 401. The 404, Army Corps of Engineers has no fee for permit; however, they may require mitigation based on their

determination for wetland impacts. This cost can range anywhere from $175,000/acre on up.

7. Level of Effort: Risks and Assumptions

The noise study presents a high/moderate risk to the project budget and schedule due to the expense & time required to complete it. If noise abatement is required it would add a huge increase to project costs. Total cost of the noise study and abatement is estimated to be $2.85 million.

Hazardous Waste/Materials pose a moderate risk to the project. Caution should be taken in acquiring right of way parcels because of the potential costs to remediate contaminated parcels. A list of parcels that would be best not to acquire has been provided by the Environmental Engineering division.

Community impacts to the Grace International Churches and Ministries Incorporated property as a result of a partial (corner) right of way take pose a low/moderate risk. It is not needed for freeway improvements but is needed by the City of San Marcos to widen the Woodland Parkway undercrossing and to realign Barham Drive. This parcel is currently used by Grace International for overflow parking during their church services. After the construction work is completed, the eastern portion of the parcel could be given back to Grace International as improved, with paved parking replacing the current dirt lot. This parcel also serves as a park and ride facility for the state.

8. PEAR Technical Summaries

As part of the preliminary environmental analysis conducted for the project, the following environmental resources were considered but no adverse impacts were identified at this time: Land Use, Growth, Farmlands/Timberlands, Cultural Resources, Hydrology and Floodplain, Geology, Soils, Seismic and Topography, Paleontology, Energy and Climate Change, Cumulative Impacts and Context Sensitive Solutions. These environmental issues will be readdressed during the preparation of the environmental document.

8.1 Community Impacts:

A mid-level Community Impacts Analysis (CIA) will be required for this project, depending on the severity of access and right of way impacts. The following community impacts may result from this revised project:

- Public service delivery, such as fire, ambulance, police, or education would be disrupted. (temporary- during construction)
- Businesses would lose opportunities because of changes in traffic patterns. (temporary-during construction)
- Detours and access to businesses in the area may impact the local economy. (temporary-during construction).
- The proposed toll lanes (Alternative 1) may have socioeconomic impacts to low income freeway users. Additional public outreach and analysis may be required for this alternative.

8.2 Visual/Aesthetics:

The project will provide the highway facility with the necessary enhancements to accommodate anticipated operational and capacity requirements and include significant structural features. These features include, but are not limited to: high occupancy connector (flyover); retaining and sound walls; concrete barriers; gore paving. The features, while necessary, will increase the quantity of structures in the corridor and result in additional urbanization of the highway facility. These urban elements will adversely impact the existing visual character and visual quality of the corridor. These adverse visual impacts should be identified, within the context of the existing conditions, and analyzed in a Visual Impact Assessment (VIA). The level of analysis will be determined by the District Landscape Architect and should be consistent with assessment standards stipulated in FHWA and Caltrans guidance. Consistent with this guidance, the assessment will include recommended avoidance and/or minimization measures for the proposed project features. This section of the document will include a description and/or depiction of recommended design alternatives including preferred material type, textures, and hue (color). In addition, the information will be reiterated in the approved Project Report document.

The proposed project will require excavation and grading to accommodate the proposed project. Generally, these graded areas require revegetation, with highway planting and/or erosion control measures, to meet project requirements prior to project approval. In addition, the planting areas will require a temporary or permanent automatic irrigation system to sustain the health and integrity of the material. As a result, highway planting and/or erosion control plans will be required for approval of this project. If the necessary project highway planting and irrigation improvements cannot be installed within the Caltrans capital cost limitation, a separate Highway Planting project will be programmed for this project area. If a separate project is necessary, the Caltrans Project Manager will initiate the programming during the project development of the roadway construction project.

In addition, whether or not separate highway planting project is programmed, the proposed project will require an extended plant establishment period beyond the maximum one (1) year period associated with the development of a roadway

construction project. The highway planting will require a minimum three (3) year plant establishment period.

8.3 Water Quality and Storm Water Runoff:

All alternatives will require preparation of a Storm Water Data Report (SWDR) Long Form with a complete Appendix E checklist. The SWDR will include documentation of pollutant potential and appropriate Best Management Practices ((BMPs). Prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared.

8.4 Hazardous Waste/Materials:

Widening activities may invoke the Department of Toxic Substances Control (DTSC) lead variance for soil excavated within the shoulders. Soil in the shoulders along Route 78 to a depth of 3 feet and at a distance of 30 feet from the traveled way may be at hazardous levels with regard to soluble Aerially Deposited Lead (ADL) concentrations. This soil may be reused onsite (within the Department of Transportation right-of-way) by being placed beneath 1 foot of clean fill material or beneath pavement, at least 5 feet above the maximum groundwater level, or disposal of ADL soil will be necessary as an option if the soil cannot be reused onsite. The estimated cost for transport and disposal of lead impacted soil to a class I landfill is $250.00 per cubic yard. The estimated cost for handling soil containing aerially deposited lead will be approximately double the roadway excavation cost for the project. Prior to the PS&E a project specific ADL study will need to be completed.

Hazardous waste concerns include service stations located at intersections. Petroleum hydrocarbons may be encountered in soil and groundwater at intersections during trenching to move utilities and during bridge reconstruction/widening at abutments and bents. A NPDES permit shall be obtained for handling and disposal of groundwater for the intersections. If soil from abutment excavations at any of the over and under crossings is to be exported, the soil may require further characterization for petroleum hydrocarbons, volatile organic compounds, or semi-volatile organic compounds to evaluate the proper disposal method.

Below is a table that shows the potential for encountering hazardous waste issues/materials along the corridor. These are properties adjacent to the corridor that would be best not to acquire.

Properties with Potential for Encountering Hazardous Waste

PENSKE TRUCK LEASING CO LP 2130 MISSION RD ESCONDIDO, CA 92029	UST	low
CONTRACTORS EQUIPMENT 1960 MISSION RD ESCONDIDO, CA 92029	UST	low
ASTREA HELICOPTER PAD 182 SANTAR PL SAN MARCOS, CA 92069	Case closed	low
CITY OF SAN MARCOS-PUBLICWRKS 201 MATA WAY SAN MARCOS, CA 92069	UST	low
PACIFIC HANDRAIL & FENCE CO 1312 BARHAM DR SAN MARCOS, CA 92069	Case closed	low
CONTRACTORS EQUIPMENT 1600 E MISSION RD SAN MARCOS, CA 92069	UST	low
Valero 553 Nordahl Rd San Marcos	UST	low
ARCO AM/PM 5263 538 NORDAHL RD ESCONDIDO, CA 92029	UST	low
TEXACO REFINING & MARKETING 2110 W MISSION RD ESCONDIDO, CA 92029-101	UST	low
HDS AUTO PARTS & MACHINE 1960 W MISSION RD ESCONDIDO, CA 920291118	Case closed	low
SEMPRA ENERGY 1623 MISSION RD	UST	low

ESCONDIDO, CA 92029		
SUPERIOR READY MIX CONCRETE LP 1508 W MISSION RD ESCONDIDO, CA 920291105	Case closed	low
ESCONDIDO CARDLOCK 1726 W MISSION RD ESCONDIDO, CA 920291111	UST	low
SKS INC 1730 W MISSION RD ESCONDIDO, CA 920291111	Case closed	low
INTERNATIONAL MARBLE & ONYX 1914 W MISSION RD ESCONDIDO, CA 920291116	Case closed	low
NATIONSRENT, INC. 1600 E MISSION RD SAN MARCOS, CA 92069	Case closed	low
PACIFIC HANDRAIL & FENCE CO 1312 BARHAM DR SAN MARCOS, CA 92069	Case closed	low
UNOCAL SVC Station #7337-3107 102 E Carmel St San Marcos	UST	low

Costs of remediating a typical service station site with leaking underground storage tanks range from $300,000.00 (soil cleanup only) to $2,000,000.00 (soil and groundwater cleanup). Costs associated with non-hazardous excavated soil containing petroleum hydrocarbons, pesticides, herbicides, or lead is $82.00 per ton. Costs for California hazardous excavated soil containing petroleum hydrocarbons, pesticides, herbicides, or lead is $105.00 per ton. Costs for Resource Conservation Recovery Act (RCRA) federal regulated excavated soil containing petroleum hydrocarbons in excess of 100 parts per million is $580.00 per ton. Costs for RCRA federal regulated excavated soil containing petroleum hydrocarbons below 100 parts per million is $295.00 per ton. Costs for RCRA federal regulated excavated soil containing pesticides, herbicides, or lead is $175.00 per ton. These fees include transportation and disposal. Note that these costs apply to the date of this memo, and may increase in the future.

Costs for non-hazardous groundwater containing petroleum hydrocarbons, pesticides,

herbicides, or lead are $0.46 per gallon. Costs for California hazardous excavated groundwater containing petroleum hydrocarbons, pesticides, herbicides, or lead is $0.83 per gallon. Costs for RCRA federal regulated groundwater containing petroleum hydrocarbons in excess of 100 parts per million is $1.28 per gallon. Costs for RCRA federal regulated groundwater containing petroleum hydrocarbons below 100 parts per million is $0.85 per gallon. Costs for RCRA federal regulated groundwater containing pesticides, herbicides, or lead are $1.13 per gallon. These fees include transportation and disposal. Note that these costs apply to the date of this memo, and may increase in the future.

Service stations with a partial or full take at most likely have petroleum hydrocarbons in soil and/or groundwater as a result of leaking underground storage tanks. Avoidance of these stations is recommended.

Treated wood waste is wood that has been treated with a chemical preservative, such as the wood guardrail posts and wood signposts. These must be managed as a non-hazardous designated waste by being disposed at a composite-lined solid waste landfill facility permitted to accept such wastes.

The existing yellow and white paint striping is not at hazardous levels but does contain lead, which is a health and safety concern. A Lead Compliance Plan will be required in order to handle the paint stripe removal and soil excavation. One Lead Compliance Plan can handle both items.

Further hazardous waste environmental investigation may be necessary on individual parcels to be acquired for the widening activities. Therefore, Environmental Engineering shall be kept informed of parcel takes and changes in scope or design. Since there are chemical constituents present in soil and groundwater within the Route 78/15 corridors, soil excavation activities shall be performed under the guidelines of a site specific Soil Management Plan and Health and Safety Plan.

A Phase I environmental site assessment shall be performed for the subject project.. The report shall include the potential for encountering aerially deposited lead, lead based paint in traffic stripe and pavement marking material, treated wood waste, and asbestos containing materials that may be removed during construction.

8.5 Air Quality:

The project site is located in the San Diego Air Basin (SDAB), which currently meets federal standards for all criteria air pollutants, except ozone (O_3). The SDAB has been designated as nonattainment/marginal for the 8-hour O_3 standard. The SDAB is designated as a federal maintenance area for carbon monoxide (CO) following its redesignation from nonattainment to a CO attainment area. At the Federal level, the SDAB is currently in attainment for Particulate Matter with an aerodynamic diameter of 10 microns or less (PM_{10}) and Particulate Matter with an

aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). However, at the State level the SDAB is currently in non-attainment for PM_{10} and $PM_{2.5}$.

Regionally this project would have to be listed in San Diego Association of Government's (SANDAG) approved Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) and be consistent with the design concept and scope.

At the project level a "Hot Spot" analysis would be performed for Carbon Monoxide (CO), using the approved 1997 CO Protocol. Particulate Matter ($PM_{2.5}$ and PM_{10}) will be analyzed using Federal Highway Administration's (FHWA) Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (PM Guidance). Also, Mobile Source Air Toxics (MSATs) will be evaluated using the approved FHWA Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA, dated December 6, 2012.

8.6 Noise and Vibration:

North of the proposed alignment there are 5 single family houses built in 1967 that are in an area that is zoned commercial. Regardless of this they are 'Grandfathered In,' as legal residences and their backyards can be legally considered as frequent outdoor human use areas of single-family residential dwellings. As such, they need to be evaluated for noise issues. The noise study includes short-term and long-term noise measurements, roadway traffic noise modeling using Federal High Administration's (FHWA) Traffic Noise Model (TNM), and traffic noise impact analysis. The estimated cost for this study is $189,720 and will take 1,860 hours to complete. The cost of potential abatement for a 106,200 square foot masonry block wall is estimated to be $2.66 million. Total cost of the noise study and abatement is estimated to be $2.85 million.

8.7 Biological Environment:

Much of the area within the project limits consists of disturbed habitat and is surrounded by mixed commercial and residential urban development in the City of San Marcos and the City of Escondido comprised of buildings, parking lots, associated landscaping, and other areas of pavement/asphalt surfaces with graded and disturbed soils. Any graded areas within the project limits must be seeded with an appropriate native erosion control mix. Specific native seed mixes will be recommended for bioswales, detention basins, and their associated slopes. Any native trees, including oaks, removed will be replaced. Any vegetation clearing including tree removal will be limited to a time of year that is outside the breeding season to avoid impacts to nesting birds.

Right-of-way will be required for this project.

The California Department of Fish and Game and U.S. Army Corps of Engineers would regulate any impacts to state or federal jurisdictional waters flowing into and including Escondido Creek under the California Fish and Game Code 1602 Lake and Streambed Alteration Agreement and Section 404 of the Clean Water Act, respectively. The Environmental Stewardship Branch shall be consulted with on timing/funding for permits and agreements if impacts to drainages flowing into Escondido Creek will occur as a result of the project.

The preferred mitigation for permanent impacts to Diegan coastal sage scrub habitat would be to debit credits from a mitigation bank, which would reduce the mitigation ratio. However, if Diegan coastal sage scrub is not mitigated at a bank, mitigation at a ratio of at least 1:1 with an acquisition cost of approximately $60,000-$70,000/acre will be required. Other habitat communities such as non-native grassland and native grassland can sometimes require mitigation at a 1:1 to 2:1 ratio depending on project impacts. Mitigation for temporary impacts to Diegan coastal sage scrub habitat include using an appropriate hydroseed mix or native plant installation to revegetate an impacted area at a 1:1 ratio.

Impacts to jurisdictional waters of the United States, including wetlands, that occur within the project area would require mitigation at a 2:1 or 3:1 ratio with a cost of $175,000/acre excluding the costs involved with right-of-way acquisition. Right of way costs will vary and could increase the cost of mitigation.

Impacts to sensitive plant species excluding oak trees may be mitigated at a cost of $10,000/taxon.

Any graded areas within the project limits must be seeded with an appropriate native erosion control mix. Specific native seed mixes will be recommended for bioswales, detention basins, and their associated slopes. Any native trees, including oaks, removed will be replaced. Oak trees are generally replaced with seedlings or liners on-site at a 10:1 replacement ratio. Landscape and Caltrans NPDES Erosion Control Specialists can provide you with an estimate of the costs associated with erosion control and tree replacement. In addition, any vegetation clearing including tree removal will be limited to a time of year that is outside the breeding season to avoid impacts to nesting birds.

Less than 10% of the total project cost may be required for biological mitigation for this project.

8.8 Cultural Resources:

The current proposed project requires compliance with Section 106 of the National Historic Preservation Act (NHPA), California Environmental Quality Act (CEQA), and California Public Resources Code (PRC) Section 5024. A record search and a literature review of the California Historical Resources Information System (CHRIS)

database (WBS 165.20.05.15) was conducted to identify previously recorded cultural resources within the project footprint. The results of this search indicated that several cultural resources were identified within the proposed project limits. An updated record search will be required when this project is in the PA/ED phase. This step is expected to be approximately four hours. Also required in the PA/ED phase is an archaeological survey report (WBS 165.20.05.25) and a historical resources evaluation report (WBS 165.20.20.15). Both an archaeological survey report (ASR) and a historical resources evaluation report (HRER) are expected to require approximately 160 hours each to complete.

Although several cultural resources are present within the project limits, no historic properties (NHPA) or historical resources (CEQA and PRC Section 5024) are expected to be impacted by the proposed project. As such, a negative historic property survey report (WBS 165.20.25.15) will be required to be completed and submitted to the State Historic Preservation Officer (SHPO) for their concurrence. A historic property survey report (HPSR) will require approximately 120 hours to complete, including consultation with the SHPO. In addition to the consultation with the SHPO, consultation with Native American communities will be required. This consultation (WBS 165.20.10.05) is expected to require approximately 80 hours.

In addition, the proposed project may be situated within sensitive geological formations containing paleontological resources. In the PA/ED phase, a qualified paleontologist must be consulted to identify the potential for paleontological resources and their assessment. This consultation and assessment are expected to require approximately 160 hours.

9. Summary Statement for PSR or PSR-PDS

Community Impacts

A mid-level Community Impact Analysis would be prepared. Community Impacts anticipated for this project include temporary construction impacts such as traffic detours and closures of on or off-ramps, noise and dust. Public service delivery such as fire, ambulance, police or education would be disrupted. Business would lose opportunities because of changes in traffic patterns. Detours and access to business in the area may impact the local economy. The proposed express lanes (Alternative 2) may have socioeconomic impacts to low income freeway users. Additional public outreach and analysis may be required for this alternative.

Visual/Aesthetic

A Visual Impact Assessment (VIA) consistent with FHWA guidelines would be required.

Water Quality and Storm Water Runoff

A Storm Water Data Report (SWDR) Long Form with a complete Appendix E checklist will be required. The SWDPR will include documentation of pollutant potential and appropriate Best Management Practices ((BMPs). Prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared.

Hazardous Waste/Materials

A Phase I environmental site assessment will be performed for the subject project. It will include study of the project location and immediate vicinity and address the potential for encountering aerially deposited lead, lead based paint in traffic stripe and pavement marking material, treated wood waste, and asbestos containing materials that may be removed during construction. These items will be addressed prior to construction.

Air Quality

The project proposes two alternatives in the County of San Diego, which is located in the San Diego Air Basin (SDAB). The U.S. Environmental Protection Agency (EPA) designated the SDAB as non-attainment for the federal 8-Hour Ozone standard. An Air Quality Study will be conducted that will measure CO, $PM_{2.5}$, PM_{10} and MSATs levels. It is not anticipated that the project will increase the frequency or severity of any existing exceedances.

Noise and Vibration

North of the proposed alignment there are 5 single family houses built in 1967 that are in an area that is zoned commercial. Regardless of this they are 'Grandfathered In,' as legal residences and need to be evaluated for noise issues. The noise study includes short-term and long-term noise measurements, roadway traffic noise modeling using Federal High Administration's (FHWA) Traffic Noise Model (TNM), and traffic noise impact analysis.

Biology

A Natural Environment Study (Minimal Impacts) (NESMI) describing the existing biological environment of the project setting and how the project alternatives will affect that environment will be completed. This study summarizes technical studies such as biological assessments, wetland assessments and focused species studies for inclusion in the final environmental document and forms the basis for discussions with the resource agencies to establish mitigation measures and whether permits will be required.

10. Disclaimer

This Preliminary Environmental Analysis Report (PEAR) provides information to support programming of the proposed project. It is not an environmental determination or document. Preliminary analysis, determinations, and estimates of mitigation costs are based on the project description provided in the Project Study Report (PSR). The estimates and conclusions in the PEAR are approximate and are based on cursory analyses of probable effects. A reevaluation of the PEAR will be needed for changes in project scope or alternatives, or in environmental laws, regulations, or guidelines.

11. List of Preparers

Cultural Resources specialist Koji Tsunoda	Date: Oct. 31, 2013
Biologist Michael Galloway	Date: Aug.15, 2013
Community Impacts specialist Michelle Madigan	Date: Nov. 13, 2013
Permit specialist Pauline Lamphere	Date: Nov. 26, 2013
Noise and Vibration specialist Azar Habibafshar	Date: Nov. 18, 2012
Air Quality specialist Paul Swearingen	Date: Oct. 18, 2013
Paleontology specialist/liaison Koji Tsunoda	Date: Oct. 31, 2013
Water Quality specialist Tony Araullo	Date: Sept. 5, 2013
Hazardous Waste/Materials specialist Diane Vermeulen	Date: Nov.7, 2013
Visual/Aesthetics specialist Tim Mann	Date: Nov. 26, 2013
PEAR Preparer Dennis Jung, Associate Environmental Planner	Date: March 5, 2015

12. Review and Approval

I confirm that environmental cost, scope, and schedule have been satisfactorily completed and that the PEAR meets all Caltrans requirements. Also, if the project is scoped as a routine EA, complex EA, or EIS, I verify that the HQ DEA Coordinator has concurred in the Class of Action.

Olga Estrada _____ Date: 3-11-15
Environmental Branch Chief

Karen Jewel
Project Manager

Date: 3/12/15

REQUIRED ATTACHMENTS:

Attachment A: PEAR Environmental Studies Checklist
Attachment B: Estimated Resources by WBS Code
Attachment D: PEAR Environmental Commitments Cost Estimate (Standard PSR)

Attachment A: PEAR Environmental Studies Checklist

Rev. 11/08

Environmental Studies for PA&ED Checklist					
	Not anticipated	Memo to file	Report required	Risk* L M H	Comments
Land Use	☐	☒	☐	L	
Growth	☐	☒	☐	L	
Farmlands/Timberlands	☒	☐	☐	L	
Community Impacts	☐	☐	☒	M	
Community Character and Cohesion	☒	☐	☐	L	
Relocations	☒	☐	☐	L	
Environmental Justice	☐	☒	☐	L	
Utilities/Emergency Services	☐	☒	☐	L	
Visual/Aesthetics	☐	☐	☒	M	
Cultural Resources:	☐	☐	☒	L	
Archaeological Survey Report	☐	☐	☒	L	
Historic Resources Evaluation Report	☐	☐	☒	L	
Historic Property Survey Report	☐	☐	☒	L	
Historic Resource Compliance Report	☒	☐	☐	L	
Section 106 / PRC 5024 & 5024.5	☐	☐	☒	L	
Native American Coordination	☐	☐	☒	L	
Finding of Effect	☒	☐	☐	L	
Data Recovery Plan	☒	☐	☐	L	
Memorandum of Agreement	☒	☐	☐	L	
Other:	☒	☐	☐	L	
Hydrology and Floodplain	☒	☐	☐	L	
Water Quality and Stormwater Runoff	☐	☐	☒	L	
Geology, Soils, Seismic and Topography	☒	☐	☐	L	
Paleontology	☒	☐	☐	L	
PER	☒	☐	☐	L	
PMP	☒	☐	☐	L	
Hazardous Waste/Materials:	☐	☐	☒	M	
ISA (Additional)	☐	☐	☒	M	
PSI	☐	☐	☒	M	
Other:	☒	☐	☐	L	
Air Quality	☐	☐	☒	L	
Noise and Vibration	☐	☐	☒	H	
Energy and Climate Change	☒	☐	☐	L	
Biological Environment	☐	☐	☒	L	
Natural Environment Study	☐	☐	☒	L	
Section 7:	☒	☐	☐	L	
Formal	☒	☐	☐	L	
Informal	☒	☐	☐	L	
No effect	☒	☐	☐	L	
Section 10	☒	☐	☐	L	
USFWS Consultation	☐	☐	☒	L	
NMFS Consultation	☒	☐	☐	L	
Species of Concern (CNPS, USFS, BLM, S, F)	☒	☐	☒	L	

Environmental Studies for PA&ED Checklist					
	Not anticipated	Memo to file	Report required	Risk* L M H	Comments
Wetlands & Other Waters/Delineation	☐	☐	☒	L	
404(b)(1) Alternatives Analysis	☒	☐	☐	L	
Invasive Species	☒	☐	☐	L	
Wild & Scenic River Consistency	☒	☐	☐	L	
Coastal Management Plan	☒	☐	☐	L	
HMMP	☒	☐	☐	L	
DFG Consistency Determination	☒	☐	☐	L	
2081	☒	☐	☐	L	
Other:	☒	☐	☐	L	
Cumulative Impacts	☒	☐	☐	L	
Context Sensitive Solutions	☒	☐	☐	L	
Section 4(f) Evaluation	☒	☐	☐	L	
Permits:					
401 Certification Coordination	☐	☐	☒	L	
404 Permit Coordination, IP, NWP, or LOP	☐	☐	☒	L	
1602 Agreement Coordination	☐	☐	☒	L	
Local Coastal Development Permit Coordination	☒	☐	☐	L	
State Coastal Development Permit Coordination	☒	☐	☐	L	
NPDES Coordination	☐	☐	☒	L	
US Coast Guard (Section 10)	☒	☐	☐	L	
TRPA	☒	☐	☐	L	
BCDC	☒	☐	☐	L	

ATTACHMENT B - Resources by WBS Code

Project ID: 1112000131
EA: 2T240K
Description: Construct Direct Connector Lanes

WBS Task Activity Code	Division Chief	Office Chief	Senior	Generalist	Biology	Cultural	Haz Waste	Community Impacts Analysis	NPDES	Environmental Construction Liason	Steward-ship	Air	Noise	Administrative Assitant	Graphics	Visual Analysis	Total
Assigned Unit			2727	2727	2735	2733	2819	2736	2810	2813	2730	2812	2814	2719	2728	2817	
Project Management																	
100.10 – Project Management - PA&ED			120														120
100.15 – Project Management - PS&E																	-
100.20 – Project Management - Construction																	-
100.25 – Project Management - Right of Way																	-
Total Project Management	-	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	120
Perform Preliminary Engineering Studies and Draft Project Report																	
160.05 – Updated Project Information									8								8
160.10 – Engineering Studies																	-
160.15 – Draft Project Report									8								8
160.30 – Environmental Study Request																	-
160.40 – NEPA Assignment																	-
Total Perform Prelim Eng Studies & Draft PR	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-	-	16
Perform Environmental Studies and Prepare Draft Environmental Document - Task Management Activities																	
165.05 – Env Scoping of Alternatives				240	16												256
165.10 – General Env Studies			120	350		160	260	80	8		24	320	1,860			560	3,742
165.15 – Biological Studies					300												300
165.20 – Cultural Resource Studies						524											524
165.25 – Draft Env Document			370	900	24	80						80		120	80	40	1,694
165.30 – NEPA Assignment																	-
Total Perform Env Studies & Prepare DED	-	-	490	1,490	340	764	260	80	8	-	24	400	1,860	120	80	600	6,516
Obtain Permits, Licenses, Agreements and Certifications (PLACs) and Route Adoptions during PA&ED Component - Task Management Activities																	
170.05 – Reqired PLACs																	-
170.10 – PLACs											100						100
170.15 – Railroad Agreements																	-
170.20 – Freeway Agreements																	-
170.25 – Agreement for Material Sites																	-
170.30 – Executed Maintenance Agreements																	-
170.40 – Route Adoptions																	-
170.45 – MOU from TERO																	-
170.55 – NEPA Assignment																	-
Obtain PLACS & Rte Adoptions during PA&ED	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	100
Circulate Draft Environmental Document and Select Preferred Project Alternative - Task Management Activities																	
175.05 – DED Circulation				72			12								16		100
175.10 – Public Hearing			48	48	16		60	10				160			128		470
175.15 – Public Comment Responses & Corr			160	240											120		520
175.20 – Project Preferred Alternative																	-
175.25 – NEPA Assignment																	-
Total Circ DED & Select Preferred Proj Alt	-	-	208	360	16	-	72	10	-	-	-	160	-	-	264	-	1,090
Prepare and Approve Project Report and Final Environmental Document																	
180.05 – Final Project Report			24	24			12		88			40					188
180.10 – Final Env Document			100	200	32							40			120		492
180.15 – Completed Env Document			80	120				2				8					210
180.20 – NEPA Assignment																	-
Total Prep and Approve PR & FED	-	-	204	344	32	-	12	2	88	-	-	88	-	-	120	-	890

Exhibit 12

Project ID: 1112000131
EA: 2T240K
Description: Construct Direct Connector Lanes

WBS Task Activity Code	Division Chief	Office Chief	Senior	Generalist	Biology	Cultural	Haz Waste	Community Impacts Analysis	NPDES	Environmental Construction Liason	Steward-ship	Air	Noise	Administrative Assitant	Graphics	Visual Analysis	Total
Assigned Unit			2727	2727	2735	2733	2819	2736	2810	2813	2730	2812	2814	2719	2728	2817	
Prepare Base Maps and Plan Sheets for PS&E Development																	
185.05 – Updated Project Information																	-
185.15 – Preliminary Design																	-
Total Prep Base Maps & Plan Sheets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Right of Way Property Management and Excess Land																	
195.40 – Property Management																	-
195.45 – Excess Land																	-
Total RW Property Mgmt and Excess Land	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Relocation																	
200.15 – Approved Utility Relocation Plan																	-
200.20 – Utility Relocation Package																	-
Total Utility Coordination	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Obtain Permits, Licenses, Agreements, and Certifications (PLACs) during PS&E Component - Task Management Activities																	
205.05 – PLACs Determination																	-
205.10 – PLACs					16						800						816
205.15 – Railroad Agreements																	-
205.25 – Agreement for Material Sites																	-
205.30 – Executed Maintenance Agreements																	-
205.45 – MOU from TERO																	-
205.55 – NEPA Delegation																	-
Total Permits & Agreements during PS&E	-	-	-	-	16	-	-	-	-	-	800	-	-	-	-	-	816
Obtain Right of Way Interests for Project Right of Way Certification																	
225.75 – Right of Way Clearance																	-
Total Obtain RW Interests for Proj RW Cert	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prepare Draft PS&E																	
230.05 – Draft Roadway Plans																	-
230.10 – Draft Highway Planting Plans																	-
230.30 – Draft Drainage Plans																	-
230.35 – Draft Specifications									32								32
230.60 – Updated Project Info for PS&E Pkg									64								64
230.90 – NEPA Assignment																	-
230.99 – Other Draft PS&E Products																	-
Total Prepare Draft PS&E	-	-	-	-	-	-	-	-	96	-	-	-	-	-	-	-	96
Mitigate Environmental Impacts and Clean-up Hazardous Waste - Task Management Actitivities																	
235.05 – Environmental Mitigation					96						24						120
235.10 – Detailed Site Investigation for HW							30										30
235.15 – HW Management Plan							170										170
235.20 – HW PS&E							20										20
235.25 – HW Clean-up																	-
235.30 – Haz Substances Disclosure Doc							60										60
235.35 – Long Term Mitigation Monitoring					40												40
235.40 – Updated Env Commitments Record			4	8			4										16
235.45 – NEPA Assignment																	-
Total Mit Env Impacts & Clean-up HW	-	-	4	8	136	-	284	-	-	-	24	-	-	-	-	-	456
Post Right of Way Certification Work																	
245.75 – Right of Way Clearance																	-
Total Post RW Clearance Work	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Exhibit 12

Project ID: 1112000131
EA: 2T240K
Description: Construct Direct Connector Lanes

WBS Task Activity Code	Division Chief	Office Chief	Senior	Generalist	Biology	Cultural	Haz Waste	Community Impacts Analysis	NPDES	Environmental Construction Liason	Steward-ship	Air	Noise	Administrative Assitant	Graphics	Visual Analysis	Total
Assigned Unit			2727	2727	2735	2733	2819	2736	2810	2813	2730	2812	2814	2719	2728	2817	
Circulate, Review and Prepare Final District PS&E Package																	
255.05 – Circ. & Rev. Draft Dist PS&E Package			4	16	8	8	10	4	16	16	4	8	8			16	118
255.10 – Updated PS&E Package				8	8	8	8										32
255.15 – Environmental Reevaluation			4	16	8	8	8	4	8		4	8	8				76
255.20 – Final District PS&E Package																8	8
255.40 – Resident Engineer's Pending File																	-
255.45 – NEPA Assignment																	-
Total Circ, Rev and Prepare Final Dist PS&E Pkg	-	-	8	40	24	24	26	8	24	16	8	16	16	-	-	24	234
Contract Bid Documents "Ready to List"																	
260.75 - Env Cert at RTL			2	8													10
Total Contract Bid Documents "RTL"	-	-	2	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction Engineering and General Contract Administration																	
270.15 – Construction Stakes																	-
270.33 – Construction Inspection																	-
270.66 – Technical Support			8	24	36	160			16								244
Total Const Engineering & Gen Contract Admin.	-	-	8	24	36	160	-	-	16	-	-	-	-	-	-	-	244
Administration of Permits, Licenses, Agreements and Certifications (PLACs) and Environmental Stewardship																	
280.10 – PLAC Compliance											20						20
280.40 – PLAC Violations											20						20
280.50 – Other Environmental Compliance										4	20						24
280.60 – Other Environmental Violations										4							4
280.70 – Updated ECR			8	72													80
280.75 – Environmental Reevaluation			16	16	8	8	8		8	16	8	8	8			8	112
280.80 – Updated PLACs											20						20
Total Admin of PLACs and Env Stewardship	-	-	24	88	8	8	8	-	8	24	88	8	8	-	-	8	280
Change Order Administration																	
285.05 – Change Order Process																	-
285.10 – Functional Support					4					120							124
Total Change Order Administration	-	-	-	-	4	-	-	-	-	120	-	-	-	-	-	-	124
Disputes and Claims																	
290.40 – Potential Claim Record																	-
Total Disputes and Claims	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accept Contract/Prepare Final Construction Estimate and Final Report																	
295.35 – Certificate of Environmental Compliance			8	24	4					16							52
295.40 – Long Term Env Mit/Mont after CCA					40					16							56
Total Accept Contract	-	-	8	24	44	-	-	-	-	32	-	-	-	-	-	-	108
Total Project Hours	-	-	1,076	2,386	656	956	662	100	256	192	1,044	672	1,884	120	464	632	11,090

Exhibit 12

Attachment D: PEAR Environmental Commitments Cost Estimate

Standard PSR Only

(Prepare a separate form for each viable alternative described in the Project Study Report)

PART 1 PROJECT INFORMATION *rev. 11/08*

District-County-Route-Post Mile 11-SD-15/78(R30.6-R32.0)(12.6/16.7)	EA: 2T240K
Project Description: Construct Direct Connector Lanes	
Form completed by (Name/District Office): Dennis Jung/11	
Project Manager: Karen Jewel	Phone Number: 619-688-6803
Date:10-28-14	

PART 2 PERMITS AND AGREEMENTS

	Permits and Agreements **($$)**
☒ Fish and Game 1602 Agreement	8,000
☐ Coastal Development Permit	0
☐ State Lands Agreement	0
☒ Section 401 Water Quality Certification	7,000
☒ Section 404 Permit – Nationwide (U.S. Army Corps)	0
☐ Section 404 Permit – Individual (U.S. Army Corps)	0
☒ CEQA Filing Fee (Fish & Wildlife)	3.000
☒ County of San Diego	50
☒ Public Notice	6,000
Total (enter zeros if no cost)	24.050

PART 3. ENVIRONMENTAL COMMITMENTS FOR PERMANENT IMPACTS

To complete the following information:

- Report costs in $1,000s.
- Include all costs to complete the commitment:
  - O.K. to break down by phase: Design, ROW, Construction, and/or provide Sub-Total.
  - Capital outlay and staff support. Refer to Estimated Resources by WBS Code. For example, if you estimated 80 hours for biological monitoring (WBS 235.35 Long Term Mitigation Monitoring), convert those hours to a dollar amount for this entry. For current conversion rates from PY to dollars, see the Project Manager.
  - Cost of right of way or easements.
  - If compensatory mitigation is anticipated (for wetlands, for example), insert a range for purchasing credits in a mitigation bank.
  - Long-term monitoring and reporting
  - Any follow-up maintenance
  - Use current costs; the Project Manager will add an appropriate escalation factor.
  - This is an estimating tool, so a range is not only acceptable, but advisable.

Environmental Commitments Alternative					
	Estimated Cost in $1,000's				Notes
	Phases				
	Design	ROW	Construction	Sub-Total	
Noise abatement or mitigation	189		2,066	2, 085	Noise study/abatement
Special landscaping					
Archaeological resources					
Biological resources				Place holder	< 10% Total Project Cost
Historical resources					
Scenic resources					
Wetland/riparian resources					
Res./bus. relocations					
Other:					
Total (enter zeros if no cost)	189			2,085	

APPENDIX E

Long Form - Storm Water Data Report

Dist-County-Route: 11-SD-15/78

Post Mile Limits: R30.6/R32.0 & 12.6/R16.7

Project Type: Build HOV Direct Connector

Project ID (or EA): 11-12000131; EA 2T240K

Program Identification: HB5

Phase: ☒ PID ☐ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): Region 9 San Diego

Is the Project required to consider 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 30 days prior to the projects RTL date. List RTL Date: _____

Total Disturbed Soil Area: 16 acres Risk Level: 2

Estimated: Construction Start Date: 1/2024 Construction Completion Date: 1/2025

Notification of Construction (NOC) Date to be submitted: 12/2023

Erosivity Waiver	Yes ☐	Date: _____	No ☒ TBD
Notification of ADL reuse (if Yes, provide date)	Yes ☐	Date: _____	No ☐ TBD
Separate Dewatering Permit (if yes, permit number)	Yes ☐	Permit # _____	No ☐ TBD

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 date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Rachel Mueller, Registered Project Engineer — 1/13/15 Date

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

Karen Jewel, *Project Manager* — 1/13/15 *Date*

Terry Kloepfer, *Designated Maintenance Representative* — 1/15/15 *Date*

Steve Alvarez, *Designated Landscape Architect Representative* — 1/20/15 *Date*

[Stamp Required for PS&E only)

Carl Savage, *District/Regional Design SW Coordinator* — 2/5/15 *Date*

STORM WATER DATA INFORMATION

1. Project Description

This project proposes the construction of direct connector lanes between Interstate 15 (I-15) and State Route 78 (SR-78) for Managed Lane (ML) vehicular traffic, which would utilize either the High Occupancy Vehicle (HOV) or Express Lanes lane management systems. This ML direct connector will interconnect the existing I-15 Express Lanes with the proposed Managed Lane facility on SR-78 from the Twin Oaks Valley Road Overcrossing (OC) to the I-15/SR-78 Separation. SR-78 would be widened to the outside within the project limits to construct managed lanes within the existing median. Operational improvements within the project limits are also proposed, which include auxiliary lane construction, bridge replacement, bridge widening, ramp relocations, and street realignments.

Portions of the SR-78 freeway between I-5 and I-15 currently experience traffic congestion and delay at peak periods. There has been significant growth in population, employment, and housing in the jurisdictions adjacent to the SR-78 corridor and the northern section of I-15, which has contributed to an increase in commuter and commercial trips along both corridors. An increased number of traffic generators along the SR-78 corridor, such as schools, hospitals and both local and regional shopping and recreational activities have further contributed to traffic congestion. Currently, there are limited north/south and east/west arterial networks, which lack sufficient connectivity with SR-78, particularly along the section of SR-78 near I-15.

The project limits were set at the eastern end of the Twin Oaks Valley Road interchange in order to minimize the congestion along the SR-78 main lanes. By providing eligible managed lane traffic the option of using the proposed managed lanes and connector, these vehicles could avoid the weaving and queuing that occurs on the main lanes as vehicles enter and exit the facility at the existing interchanges between Twin Oaks Valley Road and the I-15/SR-78 Separation. The project limits for I-15 start at the Valley Parkway interchange and end north of the I-15/SR-78 Separation. Exhibit 1 provides an overview of project area and its limits.

Alternatives

Two lane management strategies are studied as build alternatives for this project. Alternative 1 is based on the High Occupancy Vehicle strategy, and Alternative 2 is based on the Express Lanes strategy. A No Build alternative is also studied.

Alternative 1: High Occupancy Vehicle (HOV) Lanes

For Alternative 1, vehicle occupancy is the lane management strategy utilized to provide connectivity for managed lane traffic between the Interstate 15 (I-15) Express Lanes to the proposed managed lanes facility along State Route 78 (SR-78) between Twin Oaks Valley Road OC and I-15. Sometimes referred to as a carpool lane, HOV lanes are a special lane reserved for the use of carpools, vanpools and buses, which allow these higher occupancy vehicles to bypass lower occupancy traffic in the adjacent, unrestricted "general purpose" lanes.

HOV traffic, with a minimum occupancy of two or more people, will be allowed to utilize the proposed I-15/SR-78 managed lane connector structure to travel between the I-15 Express lanes and the future SR-78 managed lanes, without having to exit the managed lanes and access the existing connectors, which are operating near congestion levels during peak hours. Mass transit, motorcycles and other vehicles approved by California state law are also granted access to the proposed connector.

All other vehicles must use the general purpose lanes and existing connectors of the I-15/SR-78 Separation. Non-eligible vehicles traveling northbound on the I-15 Express Lanes would need to exit these lanes at the Citracado Parkway intermediate access point to rejoin the general purpose traffic using the existing NB I-15 to WB SR-78 connector. HOV traffic from SR-78 that want to use the I-15 Express Lanes must weave through the general purpose lanes to enter at the Citracado Parkway access point.

Alternative 2: Express Lanes

For Alternative 2, vehicle occupancy and value (congestion) pricing are the lane management strategies utilized to provide connectivity for managed lane traffic between the I-15 Express Lanes to the future proposed managed lanes along SR-78 between Twin Oaks Valley Road OC and I-15. Value pricing is a management tool where the cost to use a managed lane facility is varied during certain time periods in order to managed the demand on the facility. Examples of value pricing include peak-period surcharges or off-peak discounts.

In addition to HOV traffic, this express lanes alternative would allow vehicles with lower occupancy than the minimum needed for HOV eligibility to utilize the proposed I-15/SR-78 managed lane connector structure to travel between the I-15 Express lanes and the future SR-78 managed lanes by paying a fee that is adjusted based on the demand on

Exhibit 13

the managed lanes to keep these lanes free-flowing or at a predetermined acceptable level of service (LOS).

Northbound I-15 Express Lanes traffic traveling to westbound SR-78 would not have to exit the managed lanes facility and will have continuous path to the proposed future SR-78 managed lanes facility, which is being studied as a separate project. Eligible eastbound SR-78 traffic will also have a continuous route to the I-15 Express Lanes facility. Mass transit, motorcycles and other vehicles approved by California state law are also granted access to the proposed connector.

By allowing vehicles equipped with FasTrak transponders to pay a fee to access the managed lane facility, any unused available capacity within the system would be fully utilized. When HOV demand is low, prices are adjusted to encourage these vehicles to use the system. When HOV demand is high, prices are readjusted to maintain free-flow conditions and/or other predetermined operational goals by discouraging FasTrak vehicles from entering the facility during these high capacity periods.

No Build Alternative

A No Build alternative was considered for this project. This alternative would maintain the existing geometry, lane configurations and system management operation for both I-15 and SR-78 freeways. Current and future traffic deficiencies would not be addressed in this alternative and would not fulfill the need and purpose of this project.

This alternative would not meet the goals of SANDAG's 2050 Regional Transportation Plan (RTP) or of the TransNet Extension and Ordinance. Therefore, regional connectivity between the current managed lanes facility along I-15 and future managed lanes facilities proposed for I-5 and SR-78 would not be provided.

Project Geometrics

Both of this project's build alternatives use the same roadway geometry and project features. Therefore, there is a single project footprint with one cost estimate that applies to both alternatives, as shown in Exhibit 2.

Below is a summary of the proposed project features:

- A new managed lane connector structure between I-15 and SR-78 would connect the existing I-15 Express Lanes to the proposed managed lanes on SR-

78. This proposed cross section of this structure will accommodate two 12-foot lanes, standard 10-foot outside shoulders, and 5-foot inside shoulders. A Type 60 concrete barrier will separate the opposing directions of travel, and Type 736 bridge railing will be used on the outside shoulders. The nominal width of the structure is 59 feet, and its proposed length of 3,461feet.

- The existing Mission Road Overhead (BR No. 57-0135) structure would be widened by 30 feet in the westbound direction to accommodate one additional general purpose lane and one managed lane.

- Full bridge replacement of the existing Woodland Parkway Undercrossing (BR No. 57-0389). The existing structure is to be demolished and replaced with an undercrossing structure that is 174 feet wide and 174 feet long. The new structure will be built with precast/prestressed (PC/PS) rectangular girders and will be able to accommodate eight general purpose lanes and two managed lanes on SR-78. Woodland Parkway would be widened to four lanes, two lanes in each direction, with left turn lanes and a bicycle lane under the UC structure.

- The SR-78 roadway improvements for this project include the addition of two managed lanes, one lane in each direction. These lanes will be constructed within the existing median of SR-78 and will be constructed from the Twin Oaks Valley Road interchange to just west of the I-15/SR-78 Separation, where each lane connect to the proposed I-15/SR-78 managed lane connector.

- The Twin Oaks Valley Road Overcrossing (OC) and Nordahl Road OC will accommodate the proposed roadway improvements and will remain in place.

- The eastbound on-ramp from Barham Drive will be relocated from its current location, which is approximately one mile east of the Woodland Parkway UC, to its new location just east of the Woodland Parkway/Barham Drive eastbound off-ramp.

- To provide for the additional width needed to construct the proposed direct connector, two managed lanes in the median and the operational improvements, the SR-78 roadway will be widened to the outside by approximately 25-40 feet in each direction.

- Retaining walls will be needed along several segments of SR-78 to minimize impacts to local properties and local streets.

- When the Woodland Parkway/Barham Drive UC is replaced, a portion of Barham Drive would be realigned to accommodate the relocated eastbound Barham Dr on-ramp and to improve local traffic circulation..

- Portions of Rancheros Drive and Carmel Street will be realigned to accommodate the roadway improvements on SR-78

- In addition to the construction of the managed lanes, operational improvements are proposed for both directions of SR-78, which include the following:

    - Extending the existing westbound (WB) auxiliary lane from Nordahl Road on-ramp to the Twin Oaks Valley off-ramp;
    - An eastbound auxiliary lane between the Twin Oaks Valley Road on-ramp and the Woodland Parkway/Barham Drive off-ramp;
    - An eastbound auxiliary lane between the Nordahl Road on-ramp and the existing I-15 southbound connector;
    - A westbound acceleration lane at the Nordahl Road on-ramp; and
    - An eastbound acceleration lane from the Mission Road OH to Nordahl Road off-ramp.

Disturbed Soil Area and Project Location

The total disturbed soil area (DSA) for the project is 16.0 acres. The DSA was calculated based on the project side slopes to be disturbed, construction staging work and areas that are anticipated to be used by the contractor for equipment. Furthermore, the existing side slopes would be disturbed by the inclusion of new pavement areas, new cut/fill slopes, construction access, ditch excavation, installation of signs, etc. The existing impervious area is 56.39 acres. The proposed added impervious area is 14.7 acres. The total impervious area after construction is 71.09 acres.

The project is located within the cities of Escondido and San Marcos in San Diego County. The Municipal Separate Storm Sewer System (MS4) within the project limits is Escondido MS4.

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

The project is located within the Region 9, San Diego Regional Water Quality Control Board (RWQCB) jurisdiction. There are no RWQCB special requirements/concerns, including TMDLs or effluent limits except as shown here. There are no known local agency requirements or concerns at this time. The Section 401 Water Quality Certification will be determined at a later phase.

Hydrologic Unit

The project is within the Carlsbad Hydrologic Unit, San Marcos Hydrologic Area, and Richland Hydrologic Sub-Area 904.52 and is also within the Carlsbad Hydrologic Unit, Escondido Creek Hydrologic Area, and Escondido Hydrologic Sub-Area 904.62

Receiving Water Bodies

As shown in Exhibit 3, the San Marcos Creek and Escondido Creek are the major receiving water within the project area. San Marcos Creek is approximately 0.2 miles east of the westernmost SR-78 project limit, and Escondido Creek is approximately 3.9 miles south of the I-15 project limit.

There are no drinking water reservoirs or recharge facilities within project limits.

CWA Section 303(d) List

San Marcos Creek and Escondido Creek are both listed on the 2010 Clean Water Act 303(d) List of Water Quality Limited Segments.

San Marcos Creek is identified as being impaired with:

- DDE (Dichlorodiphenyldichloroethylene)
- Phosphorus
- Sediment Toxicity
- Selenium.

Escondido Creek is identified as being impaired with:

- DDT (Dichlorodiphenyltrichlorothane)
- Enterococcus
- Fecal Coliform
- Manganese
- Phosphate
- Selenium
- Sulfates
- Total Dissolved Solids
- Total Nitrogen as N
- Toxicity

The project lies within a High Risk Receiving Watershed, Hydrologic Unit Code (HUD) Level 12, that drains to water bodies that are on the 303(d) list as being impaired for sediment/siltation or turbidity; have a U.S. Environmental Protection Agency-approved, sediment-related Total Maximum Daily Load (TDML); and/or have the existing beneficial uses of SPAWN, MIG and COLD according to the most recent applicable Regional Board Basin Plan. (See Exhibit 4)

Land Use

Currently, the land use is primarily commercial with light residential.

Right-of-Way Requirements

Project improvements are generally within the existing right of way. Parcel takes are required at Woodland Parkway, Barham Drive and Rancheros Drive. Temporary construction easements (TCE's) are concentrated just to the east of Twin Oaks Valley

Road and the segment between Mission Road Overhead (OH) and the Nordahl Road interchange. Utility relocations involve mainly electrical lines.

Within the project limits, the existing SPRINTER heavy rail passenger line crosses SR-78 at four locations. The rail lines cross over the SR-78 roadway at two locations: east of Twin Oaks Valley Road and east of Woodland Parkway. The SPRINTER line then crosses under SR-78 at Mission Road Overhead and crosses under the I-15 roadway at Washington Avenue.

Special Construction Consideration

All areas determined as Environmentally Sensitive Areas (ESA) will be delineated in the PS&E and Design phases. ESAs will be appropriately fenced off and will be protected through the use of best management practices (BMPs). Work will be prohibited in these areas.

Soil Characteristics

Soil type, (HSG) D, Placentia Sandy Loam, with slope gradients of 2 to 9 percent, is called out as moderately well drained.

Climate

The basic climate is Southern California Coastal. Overall rainfall is 17.3 inches per year.

Hazardous Waste

The original roadway was built in 1933. Further testing will be needed for Aerially Deposited Lead (ADL).

Risk Assessment

The project is risk level 2.

Measures for Avoiding or Reducing Potential Storm Water Impacts

The project team will coordinate with Caltrans Maintenance to determine if there are any historical slope failures within the project corridor and determine the necessary mitigation measures to be proposed during the design phase.

The work along SR-78 will result in the creation of new slopes and/or the modification of existing slopes. When possible, slopes within the project will be proposed to be 4:1 (H:V) or flatter, with a maximum 2:1 (H:V) slope rate in areas where right of way or existing slopes do not allow for flatter slopes. The project, when possible, will attempt to maintain or match existing slopes to reduce any slope stabilization and erosion concerns. Retaining walls are proposed along SR-78 to reduce DSA and stabilize slopes.

The project design allows for ease of maintaining all BMPs, and the project can be scheduled or phased to minimize soil-disturbing work during the periods of inclement weather.

Within the project limits, there is an existing Treatment BMP. A detention basin is located within the southwest quadrant of the I-15/SR-78 Separation, which will remain in place, as shown in Exhibit 5.

3. Regional Water Quality Control Board Agreements

According to the NPDES Branch, at this phase of the project, there are no negotiated understandings or agreements with the Regional Water Quality Control Board (RWQCB) pertaining to this project.

4. 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

The proposed improvements will increase the impervious area, which will increase velocity and volume of downstream flow. This increase will be accounted for in the project design and mitigated through the use of BMPs.

Based on preliminary flows and conceptual design information, increased flows within the project limits should have a negligible impact on downstream flow. Efforts to mitigate the increases in velocity and volume may include the use of rock slope protection, channel lining, energy dissipation devices, and/or attenuation basins. The intent of these mitigation measures is for post-construction flows to equal pre-construction flows.

The design and calculations related to these measures will be completed during the design phase of the project.

The addition of the HOV lanes along SR 78 and the resulting work could potentially result in an increase in sediment load of the downstream flow. These increases will be mitigated through the use of treatment BMPs, discussed in Section 5 of this report.

This project will incorporate low impact development (LID) efforts to maintain or restore pre-project hydrology, as well as provide overall water quality improvement of discharges. These LID efforts will be incorporated in the development and placement of permanent BMPs during the design phase to the maximum extent practicable. Potential LID measures that will be considered for this project to improve water quality include:

- Minimizing impervious surface area and using pervious material for hardened surfaces outside of the roadway prism,
- Grading slopes to blend with the natural terrain and decrease the need for dikes, promoting sheet flow to vegetated areas that can provide water quality benefits and promote infiltration;
- Designing permanent drainage facilities that mimic the existing drainage pattern of the area through the use of permanent check dams for attenuation of flow and disconnected drainage facilities;
- Constructing permanent vegetated drainage ditches to decrease the velocity of discharge, plus decreasing the volume of discharge by promoting infiltration and allowing for pollutant removal; and
- Maintaining existing vegetated areas.

The project does not propose to encroach, cross, realign or cause other hydraulic changes to the San Marcos Creek, to the Escondido Creek, or to any other bodies of water that will affect downstream channel stability.

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

The work along SR-78 will result in the creation of new slopes and/or the modification of existing slopes. When possible, slopes within the project will be proposed to be 4:1 (H:V) or flatter, with a maximum 2:1 (H:V) slope rate in areas where right of way or existing slopes do not allow for flatter slopes. The project, when possible, will attempt to

maintain or match existing slopes to reduce any slope stabilization and erosion concerns. Measures to address slope stabilization concerns during construction are discussed in Section 6.

At this phase of the project, a general lump sum for design pollution prevention measures is calculated from the total construction cost. Individual design pollution prevention measures, including slope stabilization measures, will be identified during the design phase. The minimum anticipated erosion control measures for this project include:

- Move-in/Move-out (Erosion Control)
- Fiber rolls
- Erosion control (Hydroseed)
- Rolled Erosion Control Product (Netting)

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

Existing slopes will be created and modified to satisfy roadway widening drainage and erosion control needs. The existing roadway drainage systems will be either modified to fit with new drainage items or be abandoned and replaced by new systems. The change in drainage will result in changes in the interception of surface runoff. To ensure that the proposed drainage systems do not result in downstream erosion or scour, the project will consider energy dissipation devices at the end of culvert systems and appropriate lining material within proposed ditches.

The proposed drainage and related calculations for this project will be completed during the design phase. The design of the proposed systems and system components will be done to meet recommendations and requirements that minimize impacts due to scour and erosion, as presented in the Caltrans Highway Design Manual, resulting in insignificant effects to downstream water.

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

Clearing and grubbing is anticipated to be limited to two areas: (1) within the existing outside shoulder areas of SR 78 where the widening will occur, and (2) within the immediate vicinity of Woodland Parkway/Barham Road realignment. All areas

determined to be an environmentally sensitive areas (ESA) will be enclosed by a Temporary Fence (Type ESA).

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

Treatment BMP Strategy, Checklist T-1

This project is required to consider treatment BMPs in accordance with the July 2010 Project Planning and Design Guide (PPDG). As previously stated in Section 2 of this report, the soils are mainly classified as HSG D.

Based on this information, at this phase of the project, to be conservative, it is assumed that the estimated infiltration ranking will be less than 90% for biofiltration and infiltration devices. Detailed studies to determine the infiltration capacity, soil amendments to increase infiltration capacity and to calculate the actual infiltration ranking will be investigated during the design phase.

It is the goal of the project team to treat all the added impervious area created by the project, which is 14.7 acres. The preferred treatment method for this project will be determined at a later phase.

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

Preliminary investigation into the climate and site conditions of the project area demonstrates favorable conditions for the establishment of vegetation necessary for the use of biofiltration devices. A single Checklist T-1, Part 1 is completed for sub-watersheds because the consideration for BMPs is similar at all locations within the project. A single Checklist T-1, Part 2 is completed for all biofiltration devices because the feasibility and design elements for all biofiltration devices are similar. Further geotechnical and design investigation into these sites will be completed during the design phase.

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

Infiltration devices are not feasible for this project because the soils within the project are mainly classified as HSG D.

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

An existing detention basin is located at the southwest quadrant of the I-15/SR-78 Separation, as shown in Exhibit 5. This detention basin will be protected in place. During the subsequent project phases, the storage capacity of this existing detention basin will be further evaluated to determine if this basin's size is sufficient to handle any additional treatment needs created by this project.

Additional detention devices are not proposed for this project, at this time, due to the inability to meet the design criteria for a detention device or to construct maintenance access to the devices, and no additional right of way can be acquired to meet these criteria. During subsequent phases, this treatment BMP may be revisited once further design and environmental studies are initiated.

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

Further information will be provided during the next phase.

There is no impact to receiving bodies of water.

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

Detailed studies will be provided during future phases of the project.

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

More information will be provided at a later phase.

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

MCTTs were not proposed for the project because there are no critical source areas within the project limits.

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

Further information will be provided during the next phase.

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

As previously mentioned in Section 2 of this report, this is a Risk Level 2 project. This section presents the temporary construction site BMP strategy to be implemented for this project. Project specific BMP measures will be specified and quantified during the design phase. The cost estimate for construction site BMPs was calculated using the Percent of Total project Cost.

Storm Water Pollution Prevention Plan

This project will disturb more than one acre of soil; therefore, a Storm Water Pollution Prevention Plan (SWPPP) must be submitted by the Contractor prior to the start of construction. The SWPPP shall include a Construction Site Monitoring Program (CSMP) that presents procedures and methods related to the visual monitoring and sampling analysis plans for non-visible pollutants, sediment, turbidity, and pH.

Rain Event Action Plan

Risk Level 2 projects are required to prepare a Rain Event Action Plan (REAP). The quantities and costs for REAP will be determined during the design phase.

Construction Site BMP Strategy

Construction of this project is scheduled over one year. Whenever possible, the scheduling of earth-disturbing construction activities should not be made during anticipated rain events. To mitigate any potential runoff or run-on within the project area, construction site BMPs should be installed prior to the start of construction or as early as possible during construction.

7. Maintenance BMPs (Drain Inlet Stenciling)

The project will require drain inlet stenciling in areas where there is pedestrian access, primarily along Barham Woodland Dr. Stenciling will not be required along SR 78 as there will be no pedestrian access. The stenciling detail in the Caltrans Standard Plans will be used for drain inlet stenciling. Other types of maintenance BMPs will be considered during the design phase and coordinated with the Caltrans Maintenance Area Manager.

Exhibits

Exhibit 1	Vicinity and Project Limits Map
Exhibit 2	11-Page Engineer's Estimate (Front Page and NPDES Section only)
Exhibit 3	303(d) Receiving Water Bodies
Exhibit 4	High Risk Receiving Watersheds
Exhibit 5	Existing Treatment BMP—Detention Basin
Exhibit 6	Evaluation Documentation Form (EDF)
Exhibit 7	Risk Level Determination Documentation
Exhibit 8	Storm Water BMP Cost Summary – PID Phase Only
Exhibit 9	Checklist SW-1, Site Data Sources
Exhibit 10	Checklist SW-2, Storm Water Quality Issues Summary
Exhibit 11	Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts
Exhibit 12	Checklist DPP-1, Design Pollution Prevention BMPs, Parts 1 to 5

INDEX OF PLANS

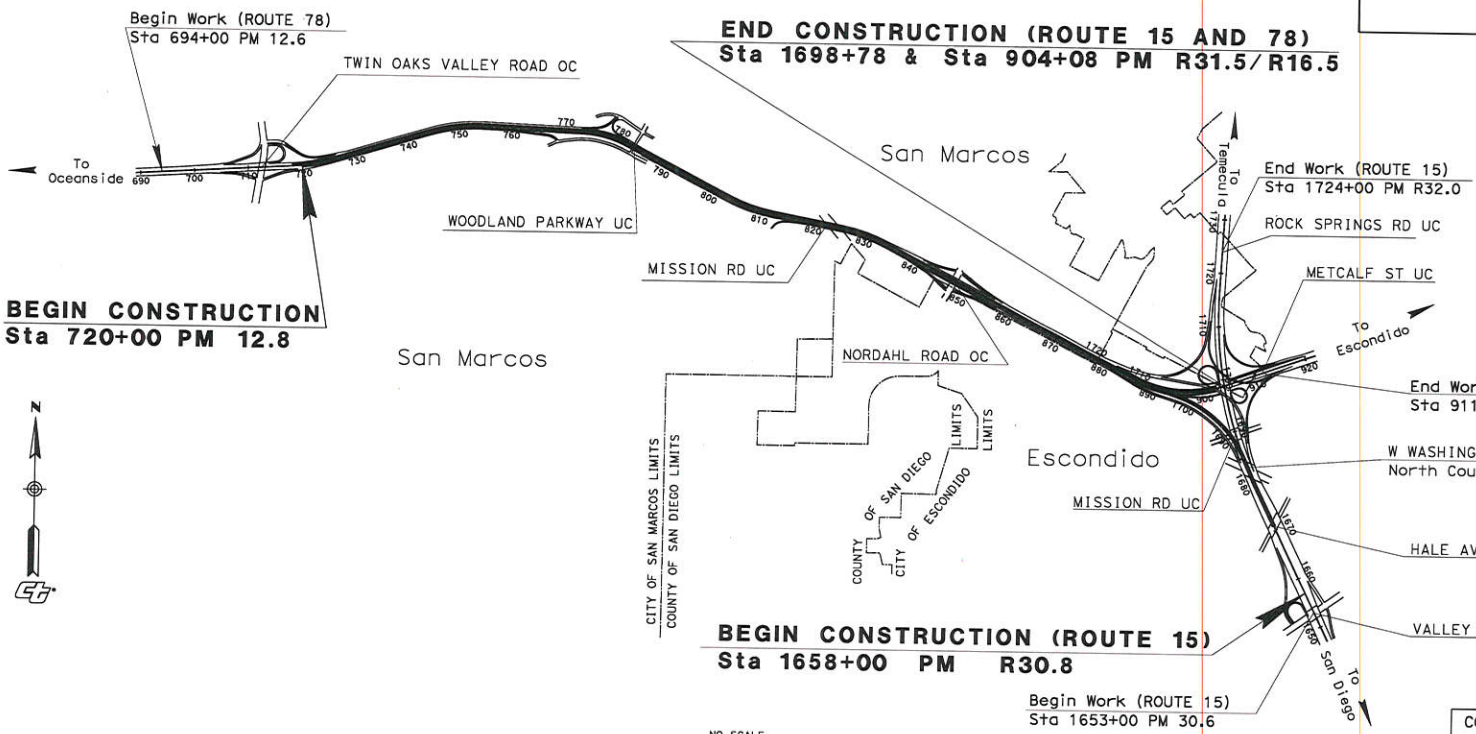
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN SAN DIEGO COUNTY
IN AND NEAR ESCONDIDO AND SAN MARCOS
ON ROUTE 15 FROM 0.4 MILE SOUTH OF HALE AVENUE UNDERCROSSING
TO 0.5 MILE NORTH OF THE ROUTE 15/78 SEPARATION AND
ON ROUTE 78 FROM 0.3 MILE WEST OF TWIN OAKS VALLEY ROAD OVERCROSSING
TO 0.2 MILE WEST OF THE ROCK SPRINGS OVERCROSSING.

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	15,78	R30.8/ R32.0, R12.6/R16.7	1	1



NO SCALE

DESIGN MANAGER	PROJECT MANAGER
RACHEL MUELLER	KAREN JEWEL

EXHIBIT 1

CONTRACT No.	11-2T240K
PROJECT ID	1112000131
UNIT 2765	PROJECT NUMBER & PHASE 1112000131K

LAST REVISION 01-06-15
DATE PLOTTED => 07-JAN-2015
TIME PLOTTED => 10:34

BORDER LAST REVISED 10/4/2013 | CALTRANS WEB SITE IS: HTTP//WWW.DOT.CA.GOV/ | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s127584 DGN FILE => Title_2T240K_150106.dgn

Exhibit 13

DISTRICT 11
PRELIMINARY
PROJECT COST ESTIMATE

11- PAGE ESTIMATE

EA 11-2T240K PID 1112000131

Type of Estimate : Project Study Report/ Project Development Support
Program Code : HB5
Project Limits : PM R30.6 - R32.0/PM R12.6 - R16.7
Description: **In San Diego County in and near Escondido and San Marcos On Route 15 From 0.4 Mile South of Hale Avenue Undercrossing to 0.5 Mile North of the Route 15/78 Separation and On Route 78 from 0.3 Mile West of Twin Oaks Valley Road Overcrossing to 0.2 Mile West of the Rock Springs Road**
Scope : Build HOV connector, one lane in ea direction, widen SR78
Alternative : Alternative 1 or Alternative 2

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 144,601,900.00	$ 188,672,682.00
STRUCTURE ITEMS	$ 47,993,629.13	$ 62,620,801.00
SUBTOTAL CONSTRUCTION COST	$ 192,595,529.13	$ 251,293,483.00
RIGHT OF WAY	$ 17,335,590.00	$ 22,027,000.00
TOTAL CAPITAL COST	**$ 209,932,000.00**	**$ 273,321,000.00**
PA/ED SUPPORT		$ 6,192,700.00
PS&E SUPPORT		$ 16,500,000.00
RIGHT OF WAY SUPPORT		$ 124,500.00
CONSTRUCTION SUPPORT		$ 14,000,000.00
TOTAL SUPPORT COST		**$ 36,817,200.00**
TOTAL PROJECT COST	**$ 210,000,000.00**	**$ 311,000,000.00**

	month	year
Date (Month/Year) of Estimate	2	/ 2015
Estimated Date (Month/Year) of Construction	2	/ 2024
Number of Months of Escalation	108	
Number of Years of Escalation	9.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	260	
Number of Plant Establishment Days	750	

Estimated Project Schedule

PID Approval	February-15
PA/ED Approval	May-20
PS&E	June-23
RTL	October-23
Begin Construction	February-24

Reviewed by District 0.E. (619) 688-6735

Leon G. Edmonds District 11 Office Engineer **Date** **Phone**

Approved by Project Manager (619) 688-6803

Karen Jewel, Project Manager **Date** **Phone**

Escalation rates used in this estimate for Highway Construction Capital Costs are 3.0% compounded annually to Construction year. The decision to use 3.0% for this estimate was as per the Office of Office Engineer. (REV03/12/14)

Section 5 ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Price		Amount
	Biological Mitigation	LS	1	x	15,000,000.00	=	$ 15,000,000
141000	Temporary Fence (Type ESA)	LF	800	x	10.00	=	$ 8,000

Subtotal Environmental *$ 15,008,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Price		Amount
20XXXX	Highway Planting	LS	1	x	70,000.00	=	$ 70,000
20XXXX	Irrigation System	LS	1	x	110,000.00	=	$ 110,000
204099	Plant Establishment Work	LS		x		=	$ -
204101	Extend Plant Establishment Work	LS		x		=	$ -
20XXXX	Follow-up Landscape Project	LS	1	x	2,204,000.00	=	$ 2,204,000
150685	Remove Irrigation Facility	LS		x		=	$ -
20XXXX	Maintain Existing (Irrigation or Planted Areas)	LS		x		=	$ -
206400	Check and Test Existing Irrigation Facilities	LS		x		=	$ -
21011X	Imported Topsoil (X)	CY/TON		x		=	$ -
20XXXX	Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD		x		=	$ -
200122	Weed Germination	SQYD		x		=	$ -
208304	Water Meter	EA	2	x	40,000.00	=	$ 80,000
2087XX	XX" Conduit (Use for Irrigation x-overs)	LF		x		=	$ -
20890X	Extend X" Conduit *(Use for Extension of Irrigation x-overs)*	LF		x		=	$ -

Subtotal Landscape and Irrigation *$ 2,464,000*

5C - EROSION CONTROL

Item code		Unit	Quantity		Price		Amount
210010	Move In/Move Out (Erosion Control)	EA	4	x	800.00	=	$ 3,200
210350	Fiber Rolls	LF	19,536	x	7.00	=	$ 136,752
210360	Compost Sock	LF		x		=	$ -
2102XX	Rolled Erosion Control Product (X)	SQFT		x		=	$ -
21025X	Bonded Fiber Matrix	SQFT/ACRE	16	x	8,000.00	=	$ 128,000
210300	Hydromulch	SQFT		x		=	$ -
210420	Straw	SQFT		x		=	$ -
210430	Hydroseed	SQFT		x		=	$ -
210600	Compost	SQFT	696,960	x	0.40	=	$ 278,784
210630	Incorporate Materials	SQFT	696,960	x	0.20	=	$ 139,392

Subtotal Environmental *$ 686,128*

5D - NPDES

Item code		Unit	Quantity		Price		Amount
130300	Prepare SWPPP	LS	1	x	40,000.00	=	$ 40,000
130200	Prepare WPCP	LS		x		=	$ -
130100	Job Site Management	LS	1	x	1,200,000.00	=	$ 1,200,000
130330	Storm Water Annual Report	EA	5	x	2,000.00	=	$ 10,000
130310	Rain Event Action Plan (REAP)	EA	27	x	500.00	=	$ 13,500
130320	Storm Water Sampling and Analysis Day	EA	18	x	6,250.00	=	$ 112,500
130520	Temporary Hydraulic Mulch	SQYD	75,000	x	0.25	=	$ 18,750
130550	Temporary Hydroseed	SQYD		x		=	$ -
130505	Move-In/Move-Out (Temporary Erosion Control	EA		x		=	$ -
130640	Temporary Fiber Roll	LF	80,000	x	3.00	=	$ 240,000
130900	Temporary Concrete Washout	LS	1	x	10,000.00	=	$ 10,000
130710	Temporary Construction Entrance	EA		x		=	$ -
130610	Temporary Check Dam	LS	1	x	50,000.00	=	$ 50,000
130620	Temporary Drainage Inlet Protection	LS	1	x	100,000.00	=	$ 100,000
130730	Street Sweeping	LS	1	x	130,000.00	=	$ 130,000
Supplemental Work for NPDES							
066595	Water Pollution Control Maintenance Sharing*	LS	1	x	30,000.00	=	$ 30,000
066596	Additional Water Pollution Control**	LS	1	x	8,400.00	=	$ 8,400
066597	Storm Water Sampling and Analysis***	LS	1	x	8,400.00	=	$ 8,400

Subtotal NPDES (Without Supplemental Work) *$ 1,924,750*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.
**Applies to both SWPPPs and WPCP projects.
*** Applies only to project with SWPPPs.

TOTAL ENVIRONMENTAL $20,082,900

Exhibit 13

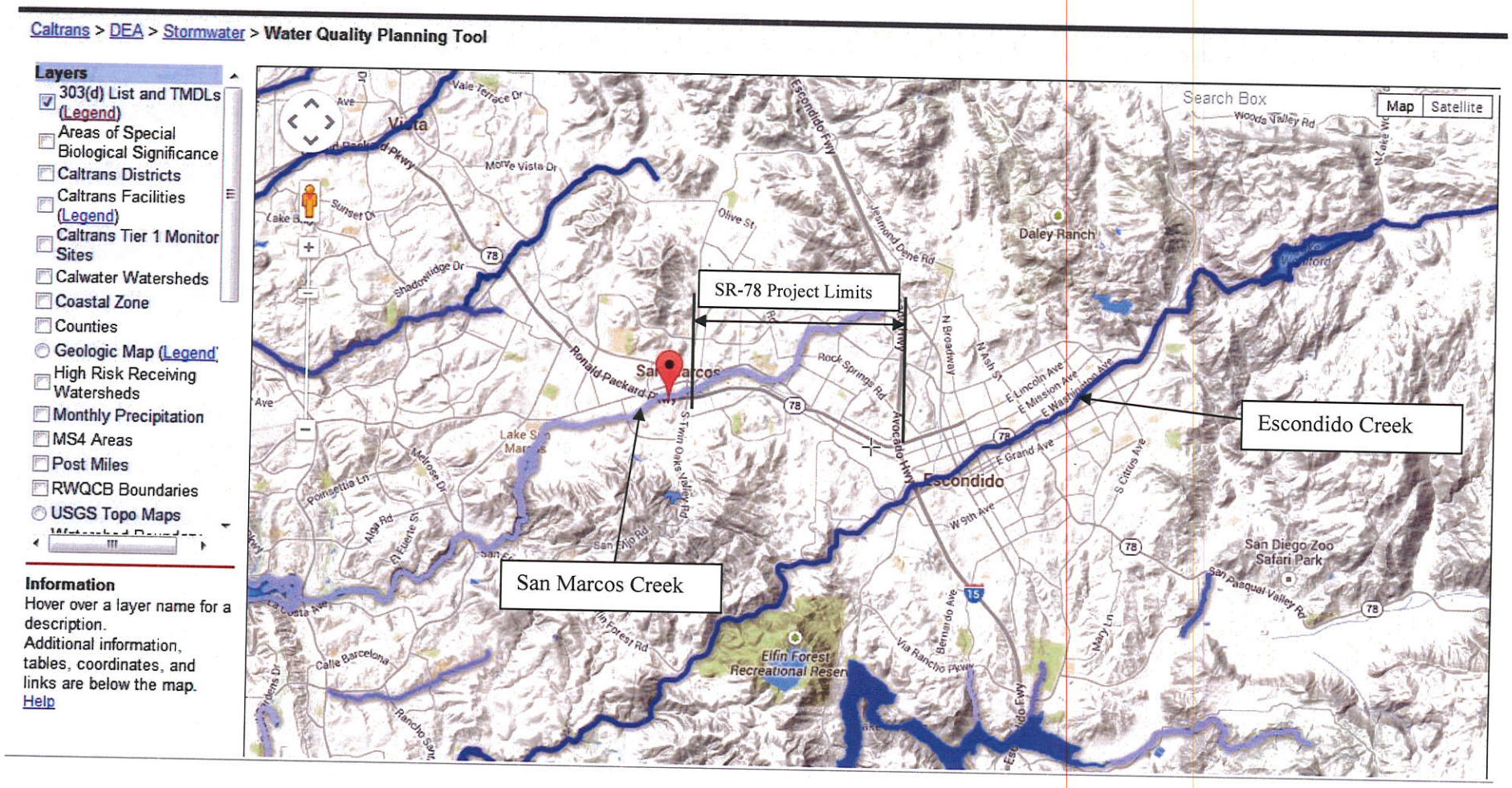


Exhibit 3: 303(d) List of Receiving Water Bodies Just Outside the Project Limits

Exhibit 13

Exhibit 3

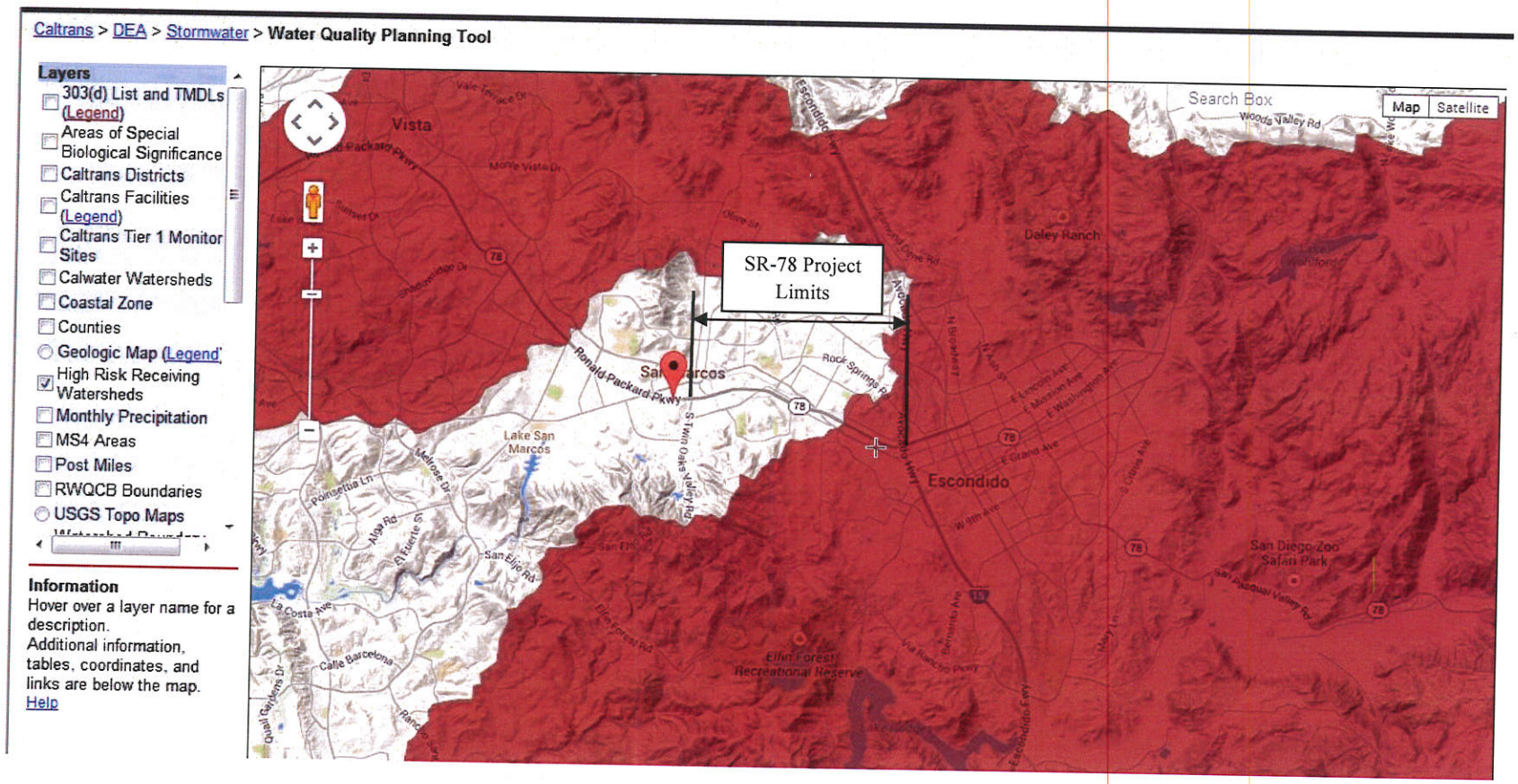


Exhibit 4: High Risk Receiving Watersheds

Exhibit 4

Exhibit 13

Exhibit 5: Existing Treatment BMP—Detention Basin

Exhibit 13

Exhibit 5

DATE: 3/07/14

Project ID (or EA): 11-12000131

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If **Yes**, go to 10. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.		✓	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 9 or 4. _____ *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If **Yes**. (Escondido), go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If **Yes**, continue to 6. If **No**, go to 10.
6.	Is it 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 10.
8.	Does the project result in a net increase of one acre or more of new impervious surface?	✓		If **Yes**, continue to 9. If **No**, go to 10. 14.7 *(Net Increase New Impervious Surface)*
9.	Project is required to consider approved Treatment BMPs.	✓	See Sections 2.4 and either Section 5.5or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
10.	Project is not required to consider Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*		Document for Project Files by completing this form, and attaching it to the SWDR.	

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

Risk Level Determination Document

Project Name:	Build HOV Direct Connector
District:	11
County:	SD
Route:	15/78
Postmile:	R30.6/R32.0 & R 12.6/R16.7
Project ID:	11-12000131

SEDIMENT RISK FACTOR

Sediment Risk Factor Worksheet	**Entry**
A) R Factor	
Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site. http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm	
R Factor Value	52.95
B) K Factor (weighted average, by area, for all site soils)	

The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.

Site-specific K factor guidance

K Factor Value	0.43

C) LS Factor (weighted average, by area, for all slopes)

The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.

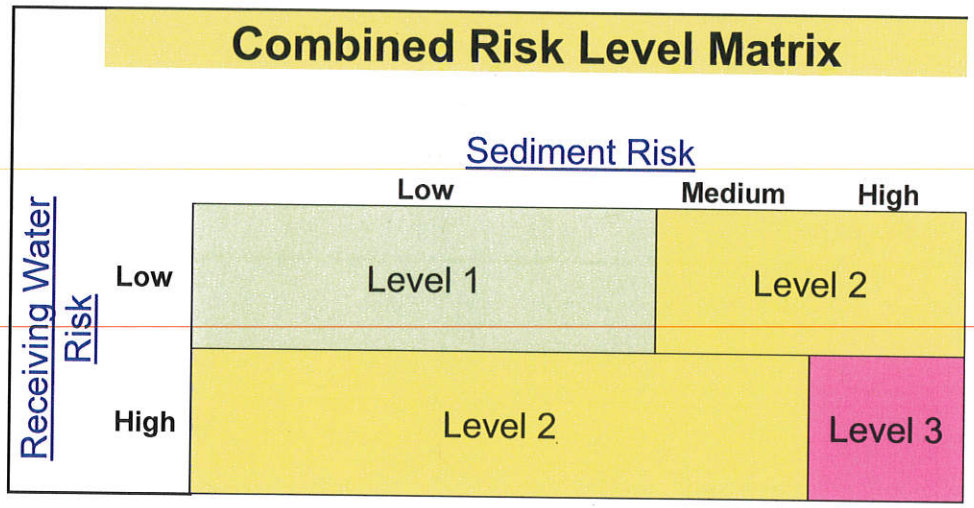
LS Table

LS Factor Value	2.3
Watershed Erosion Estimate (=RxKxLS) in tons/acre	52.37
Site Sediment Risk Factor Low Sediment Risk: < 15 tons/acre Medium Sediment Risk: >=15 and <75 tons/acre High Sediment Risk: >= 75 tons/acre	**Medium**

RECIEVING WATER RISK FACTOR

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml	NO	LOW
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml		

RISK LEVEL DETERMINATION



Project Sediment Risk: Medium

Project RW Risk: Low

Project Combined Risk: Level 2

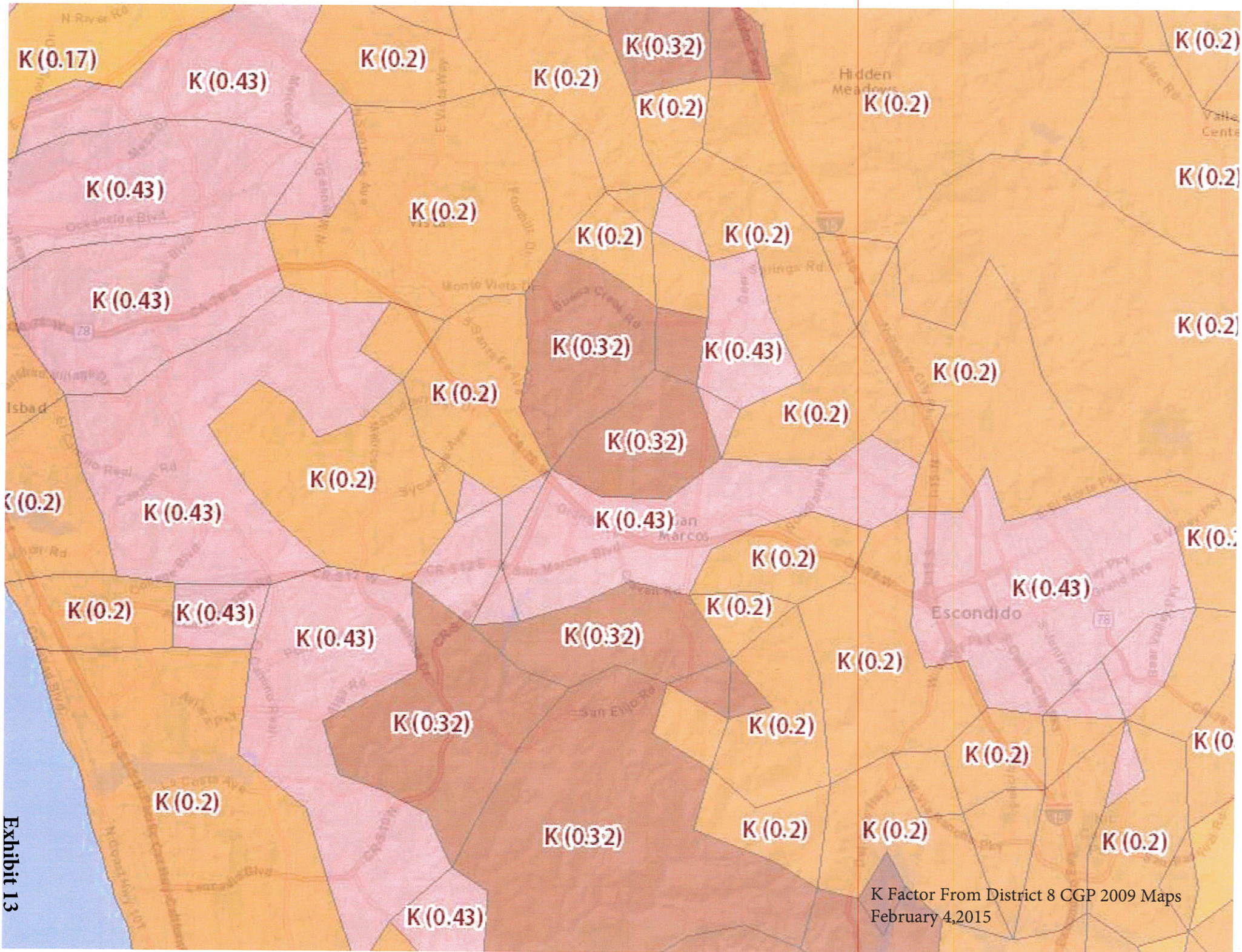


Exhibit 13

K Factor From District 8 CGP 2009 Maps
February 4,2015

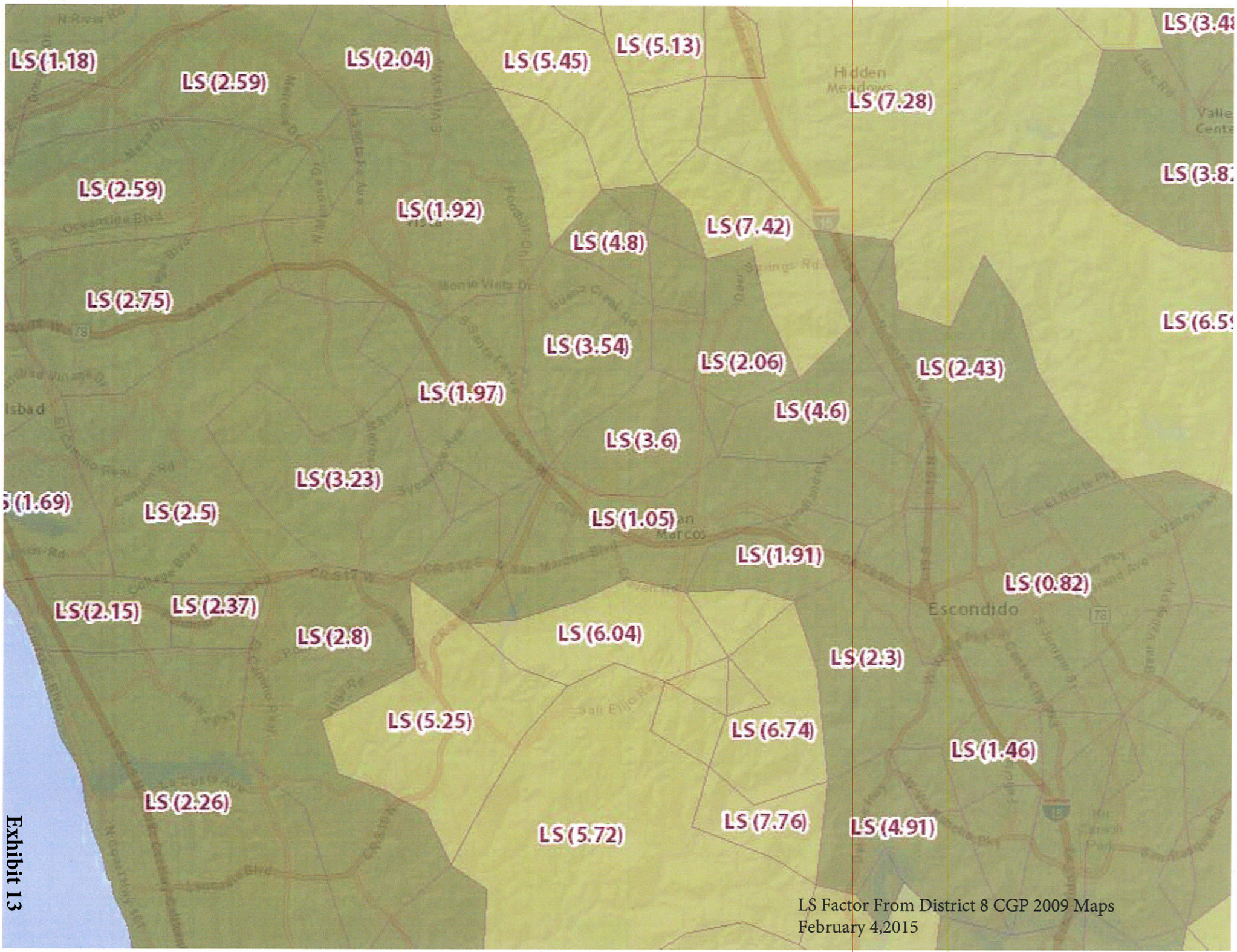


Exhibit 13

LS Factor From District 8 CGP 2009 Maps
February 4,2015

Strom Water BMP Cost Summary - PID Phase Only

This information is for Caltrans Internal use only

Project Name:	Build HOV Direct Connector
District:	11
County:	SD
Route:	15/78
Postmile:	R30.6/R32.0 & R12.6/R16.7
Project ID:	11-12000131

BMP Cost reflected here was based on an agreed value with NPDES Coordinator. The preliminary estimate for BMPs at the PID phase will reflect one percent of total construction cost. A more detailed breakdown will be provided during the Design phase.

Total Cost For Storm Water BMPs: $1,930,000.00

Checklist SW-1, Site Data Sources

Prepared by: R Mueller Date: 3/10/14 District-Co-Route: 11/SD/15-78

PM :R30.6-R32.0/R12.6-R16.7 Project ID (or EA): 11-12000131K RWQCB: Region 9 San Diego

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	
• Office of water CSU Sac	1/7/13
• Google Earth	1/7/13
• Project Strip Maps	1/7/13
Hydraulic	
• California State University, Sacramento. Water Quality Planning Tool. <http://stormwater.water-programs.com/>	1/7/13
•	
•	
Soils	
• Natural Resource Conservation Service. Natural Resource Conservation Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/	1/7/13
•	
•	
Climatic	
• *California Department of Transportation. Statewide Storm Water Management Plan. CTSW-RT-02-008*	1/7/13
•	
•	
Water Quality	1/7/13
• State Water Resources Control Board. 2006 State Water Resources Control Board 303(d) List for Water Quality Limited	1/7/13
•	
•	
Other Data Categories	
• California Department of Transportation. Storm Water Quality	

Handbooks–Construction Site Best Management Practices (BMPs) Manual.	

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: R Mueller Date: 3/10/14 District-Co-Route: 11-SD-15/78

PM : R30.6/R32.0 R12.6/16.7 Project ID (or EA): 11-12000131K RWQCB: Region 9 San Diego

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 TBD
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 TBD
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 soils within the project area.	☐Complete	☐NA TBD
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 TBD
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: R Mueller Date: 3/10/14 District-Co-Route: 11-SD-15/78

PM : R30.6/R32.0 R12.6/R16.7 Project ID (or EA):11-1200131 RWQCB: Region 9 San Diego

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: R Mueller Date: 03/10/14 District-Co-Route: 11-SD-15/78_

PM : R30.6/R31.8; R12.9/R16.5 Project ID (or EA): 11-12000131 RWQCB Region 9 San Diego

Consideration of Design Pollution Prevention BMPs

Additional Information will be provided at the PS&E phase.

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

Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
Will the project discharge to unlined channels?	☐Yes	☒No	☐NA
Will project increase potential sediment load of downstream flow?	☒Yes	☐No	☐NA
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.

Slope/Surface Protection Systems

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.

Concentrated Flow Conveyance Systems

Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
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.

Preservation of Existing Vegetation

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

Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: R Mueller Date: 03/10/14 District-Co-Route: 11-SD-15/78_

PM : R30.6/R31.8; R12.9/R16.5 Project ID (or EA): 11-12000131 RWQCB Region 9 San Diego

Additional Information will be provided at the PS&E phase.

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 or devices to reduce peak discharges.
6. Calculate the water quality volume infiltrated by DPP BMPs within the project limits. Include the percentage of the water quality volume for each BMP and subwatershed, as appropriate, for site conditions. These calculations will be used later in the T-1 checklist. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

Prepared by: R Mueller Date: 03/10/14 District-Co-Route: 11-SD-15/78_

PM : R30.6/R31.8; R12.9/R16.5 Project ID (or EA): 11-12000131 RWQCB Region 9 San Diego

Additional Information will be provided at the PS&E phase.

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 ☒NA
5. Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)?	☒Yes ☐No
If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.	
6. Are new or disturbed slopes > 2:1 (h:v)?	☐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 2:1 (h:v).	
7. Estimate the net new impervious area that will result from this project. 14.7acres	☒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
Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems.	☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: R Mueller Date: 03/10/14 District-Co-Route: 11-SD-15/78_

PM : R30.6/R31.8; R12.9/R16.5 Project ID (or EA): 11-12000131 RWQCB Region 9 San Diego

Additional Information will be provided at the PS&E phase.

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Topics 813, 834.3, and 835, and Chapter 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 4:1 h:v. ☒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: R Mueller Date: 03/10/14 District-Co-Route: 11-SD-15/78_

PM : R30.6/R31.8; R12.9/R16.5 Project ID (or EA): 11-12000131 RWQCB Region 9 San Diego

Additional Information will be provided at the PS&E phase.

Preservation of Existing Vegetation

1. Review Preservation of Property, (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

RISK REGISTER CERTIFICATION (ACCOUNTABILITY CHECKPOINTS)

Ver. 1.3

Form PM-001 (Rev. 4/2013)

The risk register is to be approved and signed-off by the district deputies* listed below for all scalability levels. By signing this form, you are certifying that you have reviewed the risks documented in the register and agree that they have been managed to the extent possible by the PDT.

Project Information

☑ Capital Project ☐ Major Maintenance Project (check one)

Project ID 1112000131 District-EA 2T240 Risk Level 2 Parent EA (if applicable)

Project Description: IN SD CTY IN ESCDIDO AND SAN MARCOS ON RTE 15 F/0.2 S/O HALE AVE UNDRCRSNG TO RTE 15/78 SEPARATION AND ON RTE 78 F/0.2 W/O NORDAHL RD OVRCRSNG TO RTE 15/78 SEPARATION

Project Manager: JEWEL, KAREN M

Project Risk Manager (For Risk Level 3 Projects)

☐ No Risk Register Certification Required -- Check Box if project is less than $1 million in total cost and risk register not prepared. Sign below and submit this form with PID, PA&ED, PS&E submittal, and RE Handoff File (as applicable).

Project Manager Date

PID (Recommended for Capital Projects Only excluding Minor Projects)		Date
Project Manager	Karen M. Jewel	2/11/2015
Deputy District Director, Planning	[signature]	3-9-15
Deputy District Director*, Design**	[signature]	3/9/15
Deputy District Director, Project Management:	[signature]	3-18-15

PDF Risk_Register_Level II EA 2T240 150206.pdf Adobe Acrobat Documer 31.8 KB

PA&ED (Required for Capital Projects Only)		Date
Project Manager		
Deputy District Director*, Environmental		
Deputy District Director*, Design**		
Deputy District Director, Project Management		

File Attachment

Prior to PS&E (Required for Capital Projects Only and Major Maintenance Projects)		Date
Project Manager		
Deputy District Director*, Design**		
Deputy District Director*, Construction		
Deputy District Director*, Right of Way		
Deputy District Director*, Environmental		
Deputy District Director, Project Management		

File Attachment

RE File Hand-off (Required for Capital Projects Only and Major Maintenance Projects)		Date
Project Manager		
Deputy District Director*, Design**		
Deputy District Director*, Construction		
Deputy District Director, Project Management		

Closeout (Required for Capital Projects Only and Major Maintenance Projects)		Date
Project Manager		

File Attachment

*or the respective Project Delivery Division Chief signatures

**or Deputy District Director, Maintenance signature for HM Projects designed by the District Maintenance Division

EXHIBIT 14

LEVEL 2 - RISK REGISTER				Project Name:	I-15/SR-78 HOV CONNECTOR		DIST- EA	11- 2T240K	Project Manager	Karen Jewel						
Risk Identification							Risk Assessment						Risk Response			
Status	ID #	Type	Category	Title	Risk Statement	Current status/assumptions	Probability	Cost Impact	Cost Score	Time Impact	Time Score	Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	1	Threat	PM	Project funding	Unsecured project funds could delay the project delivery and this could cause increase in costs due to future market conditions.	Project requesting support cost funds from the 2016 STIP to proceed to PAED. Funding sources for future phases is unknown at this time.	3-Moderate	2 -Low	6	4 -Moderate	12		Accept	It is important to further investigate funding options for this project and to coordinate with SANDAG. Review the project cost estimate in PAED.	Project Manager	1/29/2015
Active	2	Threat	Environmental	Hazardous waste	Contaminated material could be encountered or the level of contamination could be greater than anticipated which may increase project cost.	The Preliminary Environmental Analysis Report (PEAR) has identfied potential locations where hazardous waste may be encountered.	2-Low	4 -Moderate	8	8 -High	16		Mitigate	During PAED phase, a Phase I environmental site assessment will be performed.	Environmental	1/29/2015
Active	3	Threat	Design	Unidentified utilities	Unidentified utilities (Electrical power lines, gas lines, etc) may increase the project cost and delay the execution.	Known utilities documented in the PSR-PDS. More detailed study to be done in subsequent phases.	3-Moderate	4 -Moderate	12	8 -High	24		Mitigate	Conduct field investigation to identify utilities before construction and revise design for any potential impacts. Relocate the utilities during construction with a CCO.	Design	1/29/2015
Active	4	Threat	Design	Soundwalls design	Due to the lack of design data at this point, the soundwall design is undefined and this could cause an increased in costs.	Prelimiinary Environmental Assessment Report provided potenital locations that may require noise abatment and an estimated total cost for soundwalls.	3-Moderate	4 -Moderate	12	4 -Moderate	12		Mitigate	Detailed noise studies will be prepared during PAED phase. Engineer's Estimate was updated to included soundwall costs.	Design and Environmental	1/29/2015
Active	5	Threat	Design	Traffic closures	Undefined roadway closures due to unknown construction windows, environmental commitments, and/or rainy season requirements may impact the project schedule and increase support cost.	TMP Data Sheet has been obtained which include a list of preliminary TMP elements, such as lane closure charts and COZEEP, and costs.	3-Moderate	4 -Moderate	12	8 -High	24		Mitigate	Obtain and review traffic charts and determine potential workarounds to be implemented during construction. Review potential impacts to construction activities. Undefined weekend closures, etc. would be reviewed as part of the PA/ED.	Design	1/29/2015
Active	6	Threat	ROW	Condemnation delay	If Caltrans goes through the condemnation process there could be a delay to the project delivery including the construction phase.	R/W Data Sheet has been obtained and includes a Condemnation Factor to account for the possibility of a condemnation process in subsequent phases.	2-Low	2 -Low	4	8 -High	16		Mitigate	Provide work-around areas in contract documents suspending the work if an area of work is not available due to R/W delay. Work proactively with RW to identify potential conflicts in acquiring parcels.	Design and Right of Way	1/29/2015
Active	7	Threat	Design	Design exceptions for HOV transition geometry	If design exceptions are required, additional time will be needed it for processing them and obtaining the approvals. This could delay the project and increase support costs.	Identified design exceptions were discussed with the HQ Design Reviewers and were included in the Design Standard Risk Assessment tables within the PSR-PDS.	3-Moderate	8 -High	24	8 -High	24		Mitigate	In PAED, review design alternatives for potential mitigation of design exceptions. Identify the need for additional design exceptions and coordinate with HQ Design Reviewer.	Design	1/29/2015
Active	8	Threat	Design	Construction Staging	Complicated staging of construction activities, especially the proposed structures, could impact the project schedule and increase project costs.	An overall concept of project phasing/staging is presented in the PSR-PDS, which describes the order of major construction activities.	3-Moderate	4 -Moderate	12	8 -High	24		Mitigate	Develop preliminary stage construction plans during PAED to further identify constructability issues and potential increases to project cost.	Design	1/29/2015
Active	9	Threat	Design	Retaining Walls	Due to potential soil issues and constrained areas, selection of alternative retaining wall types and construction methods may increase project costs and impact project schedule.	Combined recommendation from Geotechnical Services and Maintenance during Constructability Review	3-Moderate	8 -High	24	4 -Moderate	12		Mitigate	Begin geotechnical studies at the start of PAED to assist in determining appropriate wall types and construction methods needed.	Design	1/29/2015
Active	10	Threat	DES	Geotechnical Studies	A higher level of geotechnical testing and mitigation for potential soil issues may be required, which could increase project cost and impact the schedule.	Per recommendation from Geotechnical Services during Constructability Review	4-High	4 -Moderate	16	4 -Moderate	16		Mitigate	Begin geotechnical studies at the start of PAED to assist in determining wall types, connector foundation, construction methods and soil conditioning.	Design and Geotechnical	1/29/2015

LEVEL 2 - RISK REGISTER				Project Name:	I-15/SR-78 HOV CONNECTOR		DIST- EA	11- 2T240K	Project Manager	Karen Jewel			Sheet 2 of X			
Risk Identification							Risk Assessment						Risk Response			
Status	ID #	Type	Category	Title	Risk Statement	Current status/assumptions	Probability	Cost Impact	Cost Score	Time Impact	Time Score	Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	11	Threat	Design	HOV Connector Passing Lanes	Per HDM, passing lanes are required, which would increase the amount of roadway widening on both roadways, and impact project cost, scope and schedule.	Recommendation from meeting with Design Reviewer and from Constructability Review.	4-High	8 -High	32	4 -Moderate	16		Mitigate	Feasibility studies have been initiated for wider connector structure and/or a structure that can be widened in the future. Continue with formal study in PAED	Design	1/29/2015
Active	12	Threat	Environmental	Environmental Document Process	New legislation and/or protocols may impact the type of environmental studies needed for this project, which would impact project schedule, scope, and/or cost.	As of this entry, the proposed legislation has not been passed.	3-Moderate	4 -Moderate	12	4 -Moderate	12		Accept	Since it is unknown when the Legislation will be approved and/or what impacts this may have on the project, reevaluate project status once PAED phase has begun.	Environmental	2/5/2015
Active	13	Threat	Environmental	Migratory Birds	If migratory birds are located nesting within or near our R/W, this would require additional studies and potential limitiations on construction activities, which would increase project schedule and cost.	Per January 2015 conversation with Environmental, a migratory bird survey would be needed to determine if there are nesting birds within the project limits.	2-Low	2 -Low	4	2 -Low	4		Mitigate	Begin environmental study at the start of PAED to determine any potential nesting areas in and around the project limits.	Envronmental	2/5/2015
Active	14	Threat	Design	Public Transporation Impacts	Construction staging may impact local public transporation systems requiring coordination with appropriate agencies which may impact project schedule and cost.	Public transportation systems within the project limits, including SPRINTER and BRT routes, have been identified in the PSR-PDS.	3-Moderate	4 -Moderate	12	8 -High	24		Mitigate	Begin interactions with pubilic transporation agencies in PAED to determine appropriate methods to maintain service during construction.	Design	1/29/2015
Active	15	Threat	Design	Contractor Staging Area	Due to limited excess R/W and/or potential environmental constraints, an off-site location may be needed for a contractor staging area, which would increase project costs and project footprint.	Quadrants of the 15/78 interchange may be available potential staging area sites.	3-Moderate	4 -Moderate	12	4 -Moderate	12		Mitigate	Identify potential locations during preliminary design studies of PAED. Work with Environmental and NPDES to determine feasiblity of using one of the interchange quadrants.	Design	1/29/2015
Active	16	Threat	Design	Existing Detention Basin	Impacts to the existing basin would require reconstruction using current standards and/or possible R/W acquisition if existing site is no longer usable, which would impact project schedule and cost.	Preliminary connector structure design avoids impacts to the detention basin.	3-Moderate	8 -High	24	8 -High	24		Mitigate	During subsequent phases, ensure that connector columns and other project features remain outside of the detention basin.	Design and Hydraulics	1/29/2015
Active	17	Threat	Design	Stormwater Design	Roadway widening increases the amount of impervious surface and could impact BMP type selection, which could increase project cost.	Storm Water Data Report (SWDR) has been completed and discusses possible mitigation for stormwater impacts.	3-Moderate	4 -Moderate	12	2 -Low	6		Mitigate	The SWDR is a living document that will be revisited during each subsequent project phase. Treatment BMPs will be studied starting in PAED phase.	Design and NPDES	1/29/2015
Active	18	Threat	Design	Construction Noise Restrictions	Restrictions on construction activities involving excessive noise impacts may increase project schedule and cost.	From preliminary design, bridge columns will use pile foundations and roadway widening will be near or adjacent to existing residential and business structures.	3-Moderate	4 -Moderate	12	2 -Low	6		Mitigate	During PAED, work with Environmental and Construction to determine potential construction noise restrictions and viable work alternatives.	Design and Environmental	1/29/2015
Active	19	Threat	Design	Bridge Column Locations	Subsequent design studies could relocate bridge columns, which would impact project cost and schedule.	Revised Advance Planning Studies avoided column placement in areas that would trigger significant project impacts.	3-Moderate	2 -Low	6	4 -Moderate	12		Mitigate	As bridge design studies continue in PAED, work with Structure Design and functional groups to minimize impacts to identfied areas to avoid.	Design and Structures	1/29/2015
Active	20	Threat	Design	Existing Channel	Existing channel between Nordahl and 15/78 SB Connector cannot be upgraded current standards, which will impact project scope and increase cost.	During a discussion with Hydraulics, impacts to this channel should be avoided, if feasible.	4-High	4 -Moderate	16	4 -Moderate	16		Mitigate	During PAED, future design efforts will explore ways to avoid impacting the channel.	Design and Hydraulics	2/5/2015
Active	21	Threat	Design	New Detention/Retention Basins	New basins may be required to avoid any increase of flow into the San Marcos Creek and its tributaries, which will increase project costs and impact project scope and schedule.	During a discussion with Hydraulics, additional impacts to San Marcos Creek should be avoided .	4-High	8 -High	32	8 -High	32		Mitigate	During PAED, drainage and Hydraulic/Hydrology studies must closely evaluate the potential impacts to the San Marcos Creek and its tributaries.	Design and Hydraulics	2/5/2015

EXHIBIT 14

Revision# & Date: __Start___ 1/30/14_____	***Record of FHWA Involvement***	Co-Route-PM 11-SD-15 PM R30.6/PM32.0 & 11-SD-78 PM 12.6/PM R16.7 District-EA 11-2T240K Prgm. Code 11.12.000.131

Project Personal	**Name**	**Phone # 619**
Project Engineer	Edmund R. Kennedy, PE	(619) 688-3647
Project Manager	Ann Fox, PE	(619) 688-6803
Design Senior / IQA Engr.	Jesus Vargas	(619) 688-3157
FWHA Transportation Engr.	Manual Sanchez	(619) 699-7836

Project Phase

- ☒ Project Initiation Document (PID)
- ☐ Project Approval & Environmental Document (PA&ED)
- ☐ Plans, Specifications & Estimate (PS&E – RTL)
- ☐ Construction Administration
- ☐ Final Acceptance

High Profile Project ☐ **YES** ☒ **NO** ☐ **Preliminary (√ if Yes)**

ITEM OF INTEREST TO FHWA and STEWARDSHIP AGREEMENT	RESPONSIBLE CALTRANS UNIT	Applicable Completed √ (date)	Initial	Date	Guidance	Web site for Guidance
Consultation with FHWA Transportation Engineer (TE) to determine FHWA Involvement and whether project is High Profile per Stewardship Agreement and Supplement.	Project Management	☒ Yes ☐ 1/23/2014	CT FHWA		Project Develop. Procedures Manual (PDPM)	http://www.dot.ca.gov/hq/oppd/pdpm/chap_pdf/chapt02.pdf
Consultation with FHWA TE to determine type of Intelligent Transportation System (ITS) project and level of FHWA involvement, per 23 CFR 940.11. Major ITS projects (new systems, multi-jurisdictional, multi-modal, or software development) are HPP, however even minor ITS projects have procedural requirements. See Stewardship Agreement and Approach to Identifying HPP, and LAPG, Chapter 12.6	Project Management	☐ Yes ☐	CT FHWA		23 CFR 940.11	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
High Profile Project Agreement (HPPA) Date HPPA is executed. Include HPPA as attachment to this form. For Supplemental (HPPA) , See: http://www.dot.ca.gov/hq/oppd/stewardship/Process_for_Identifying_and_Selecting_High_Profile_Projects.pdf	Project Management	☐ Yes ☐	CT FHWA		Division of Design Manuals and Guidance	http://www.dot.ca.gov/hq/oppd/guidance.htm
Administration / Financial Management Included for information only. See Office of Federal Resources http://onramp/hq/budgets/fedres.shtml or for 'Projects Funded by Others', see the Division of Local Assistance: http://www.dot.ca.gov/hq/LocalPrograms/	Budgets and or Accounting	☐ Yes ☐	CT FHWA		Division of Accounting	http://www.dot.ca.gov/hq/asc/
Right of Way Included for information only. See Division of Right of Way at: **http://www.dot.ca.gov/hq/row/index.htm**	Right of Way	☐ Yes	CT		Project Develop. Procedures	http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.ht

Exhibit 15

for current Right of Way Manual.		☐	FHWA		Manual (PDPM)	m
Environmental Included for information only. See Division of Environmental Analysis at: **http://www.dot.ca.gov/hq/env/index.htm** for the Standard Environmental Guidance (SER). Note that FHWA is no longer typically involved.	Environmental Analysis	☐ Yes	CT FHWA		Office of NEPA Delegation	http://www.dot.ca.gov/hq/env/nepa_pilot/index.htm

ITEM OF INTEREST	TYPICAL PROJECT PHASE	Applicable Completed (date)	High Profile Project ☐ YES ☐ NO ☐ Preliminary (√ if Yes) Initial	Date	Guidance	Web site for Guidance
Deign / Project Management						
Consultant Selection/Agreement for procurement of engineering & design services. Must comply with 23 CFR 172 Competitive negotiations using qualifications-based selection process. Includes using consultants in a management role. FHWA approval for HPP only (consultant selection cannot be delegated - see HPPA).	Phase Varies	☐ Yes ☐	CT FHWA		23 CFR 172	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Cost Estimate Review for Major Projects (typically >$500M). Coordinate with FHWA to schedule review – ties in with Major Projects below http://www.fhwa.dot.gov/programadmin/mega/mpguide.cfm	Throughout PDP $960 million	☒ Yes ☐	CT FHWA		Major Projects – Cost Estimating Guidance	http://www.fhwa.dot.gov/programadmin/mega/cefinal.cfm
Annual Financial plan for projects from $100M to $499M. Send plan to FWHA when applicable. Codified in Title 23 US Code Section 106 (i) from US Public Law 109-59 (SAFETEA-LU) Sec 1904 (i) http://www.fhwa.dot.gov/safetealu/legis.htm	Throughout PDP--No	☐ Yes ☐	CT FHWA		Title 23 US Code	http://uscode.house.gov/download/pls/23C1.txt
Major Projects (≥ $500M) and TIFIA Loan Projects. Annual Project Management Plan and Financial Plan Codified in Title 23 US Code Section 106 (i) from US Public Law 109-59 (SAFETEA-LU) Sec 1904 (i) http://www.fhwa.dot.gov/safetealu/legis.htm	Throughout PDP--No	☐ Yes ☐	CT FHWA		FHWA Major Project Guidance and Title 23 US Code (see above link)	http://www.fhwa.dot.gov/programadmin/mega/011907.pdf
Major ITS Project Development, (new systems, multi-jurisdictional, multi-modal, or software development). FHWA approves SERF and SEMP. See Project Management Item of Interest for more information.	Varies--No	☐ Yes ☐	CT FHWA		23 CFR 940.11	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Non-Major (Minor) ITS Project Development (upgrade existing system, add ITS field devices). SERF approval delegated to Caltrans. See Project Management Item of Interest for more information.	PID--No	☐ Yes ☐	CT FHWA		23 CFR 940.11	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
New or Modified Interstate Access Control Change - Determination of Engineering and Operations Acceptability (conceptual & final approval). See also: http://www.fhwa.dot.gov/legsregs/directives/fapg/access.htm, and FR Doc 98-3460 (2/11/1998). http://www.access.gpo.gov/su_docs/fedreg/frcont98.html	PID--Yes? PA&ED	☐ Yes ☐	CT FHWA		Design Information Bulletin 77 Chapter 500 – HDM and 23 CFR 625	http://www.dot.ca.gov/hq/oppd/dib/dib77.htm http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Design Exceptions **non** Interstate. Delegated to Caltrans. For NHS system see 23 CFR 625. Send Fact Sheet to FHWA when indicated. See also: http://www.dot.ca.gov/hq/oppd/pdpm/chap_pdf/chapt21.pdf	PID--Yes PA&ED	☐ Yes ☐	CT FHWA		Highway Design Manual Topic 82	http://www.dot.ca.gov/hq/oppd/hdm/pdf/english/chp0080.pdf
Design Exceptions **on** the Interstate (13 controlling Criteria). See also: http://www.dot.ca.gov/hq/oppd/pdpm/chap_pdf/chapt21.pdf	PID--No PA&ED	☐ Yes	CT		HDM Index 82.2 and	http://www.dot.ca.gov/hq/oppd/hdm/pdf/english/

ITEM OF INTEREST	TYPICAL PROJECT PHASE	Applicable Completed (date)	High Profile Project ☐ YES ☐ NO ☐ Preliminary (√ if Yes) Initial	Date	Guidance	Web site for Guidance
Based on 23 CFR 625.		☐	☐ FHWA		108.3(2)(c)	chp0080.pdf
Design period. Geometric design of new and reconstructed facilities on the Interstate should be based on a 20-year design period. Related to Topic 103.2 of the HDM. See AASHTO *'A Policy on Design Standards Interstate System'* January 2005 and FHWA Memorandum dated 5/8/06 http://www.fhwa.dot.gov/programadmin/standards.cfm	PID--Not yet	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 625 Topic 103.2 HDM	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm
Value Engineering Analysis performed on project where cost is ≥ $25M or for bridge projects where the costs is ≥ $20M (or as required by FHWA). See also (SAFETEA-LU) Sec 1904 (e). Send report to FWHA when indicated. http://www.fhwa.dot.gov/safetealu/legis.htm	PID preferred PA&ED and/or later--pending	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 627 Chapter 19 - PDPM	http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm
Approved PID – copies sent to FHWA. Normally done for all HPP or where indicated.	PID--OK	☐ Yes ☐	☐ CT ☐ FHWA		Chapter 9 - PDPM	http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm
Public Interest Findings See the Office of Federal Resources for PIF guidelines: http://onramp/hq/budgets/federalresources/library/PIF_Guidelines_Nov_2006.pdf PIF form can also be accessed in Appendix B of the RTL Guide: http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide						
Airspace Clearance FAA. Additional notice to FAA required (see Topic 207 – HDM and FAA regulations 14 CFR 77. http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title14/14tab_02.tpl	PID--No	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 620 (A)	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Use of Negotiated Consultant Contracts. HPP only. See 23 CFR 172 for administration of engineering and design related service contracts.	Varies	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 172.5(3)	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Statewide and project specific use of proprietary products and processes. HPP only unless delegated to Caltrans. FHWA approval required for statewide use. See Section 6.10 of the Ready-to-List and Construction Contract Award Guide (RTL Guide). http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/	PS&E	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 635.411	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Use of publically furnished materials and expenses. HPP only unless delegated to Caltrans. FHWA approval required for statewide use. See Section 7.8 of the Ready-to-List and Construction Contract Award Guide (RTL Guide): http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/ The Office of Federal Resources is also involved.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 635.407 Office of Federal Resources	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm http://onramp/hq/budgets/fedres.shtml
Advertising period less than three weeks. FHWA approval required. Typically used for emergency contracts. See Section 12 of the Ready-to-List and Construction Contract Award Guide (RTL Guide). http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/	PS&E	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 635.112	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Use of contracting method other than competitive bidding. HPP only unless delegated to Caltrans. Typically used for emergency contracts where life or health is significantly compromised. See Major Damage Restoration Program, Director Order Guidelines:	PS&E	☐ Yes ☐	☐ CT ☐ FHWA		23 CFR 635.104 and 635.204	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm

ITEM OF INTEREST	TYPICAL PROJECT PHASE	Applicable Completed (date)	High Profile Project ☐ YES ☐ NO ☐ Preliminary (√ if Yes) Initial	Date	Guidance	Web site for Guidance
http://onramp.dot.ca.gov/hq/maint/orway/ha23/do_guide/dog00.html						
Use of Force Account. HPP only unless delegated to Caltrans. Typically used for emergency contracts where life or health is significantly compromised. Also limited use for RR or utility work. Also applies to supplemental work. See Section 1 of the RTL Guide and Major Damage Restoration Program, Director Order Guidelines.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 635.204 and 635.205	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Use of Mandatory Borrow / Disposal Sites. HPP only unless delegated to Caltrans. See Section 1 of the RTL Guide Note that Optional Borrow / Disposal sites operate under different rules (see Section 10 of the RTL Guide).	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 635.407	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Use of Publically Owned Equipment. HPP only unless delegated to Caltrans. See Section 12 of the RTL Guide	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 635.106	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Misc. activities where a PIF is required; • Buy America.23 CFR 634.410 • Convict-produced materials (as State-furnished).23 CFR 635.417 The RTL Guide has additional information throughout	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR as noted	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Approve preliminary plans for major and unusual structures. HPP only unless delegated to Caltrans.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	Title 23 US ode Chapter 1 - Section 106	http://www.access.gpo.gov/uscode/title23/title23.html
Experimental Features, both pilot and demonstration. Includes Design Sequencing. For directions on completing the required Construction Evaluated Work Plan for experimental features, see http://www.dot.ca.gov/hq/oppd/rescons/CEWP_Guidelines_09-28-06.pdf, and FHWA guide on Construction Projects Incorporating Experimental Features http://www.fhwa.dot.gov/programadmin/contracts/expermnt.cfm	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 625 and for Des/Seq; California codes Streets and Highways Code Sec. 217-217.9	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm http://www.leginfo.ca.gov/calaw.html
Use and occupancy of Acquired R/W, including R/W encroachments and access rights. See Index 504.8 of the HDM for a discussion of access rights at interchanges.	PA&ED PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 710	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Emergency Relief and Restoration Damage Assessment Reports (ER – DAF) **on** State Highway System. For DAF sample and instructions, see http://www.fhwa.dot.gov/cadiv/other/emergency.htm and Apex. 'O' of the PDPM http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm	PA&ED PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 668 See also the CT Division of Maintenance Major Damage web page (internal - INTRANET)	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm http://onramp.dot.ca.gov/hq/maint/orway/ha23/index.htm

ITEM OF INTEREST	TYPICAL PROJECT PHASE	Applicable Completed (date)	High Profile Project ☐ YES ☐ NO ☐ Preliminary (√ if Yes) Initial	Date	Guidance	Web site for Guidance
Emergency Relief and Restoration Damage Assessment Reports (ER – DAF) **off** State Highway System. **HPP only**, except where delegated to Caltrans per ER Guidance, question 5 and 8 specifically. See: http://www.fhwa.dot.gov/cadiv/docs/er_qa.htm. For DAF sample and instructions, see http://www.fhwa.dot.gov/cadiv/other/emergency.htm and Apex. 'O'-PDPM http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm	PA&ED PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 668 See also the CT Division of Maintenance Major Damage web page (internal - INTRANET)	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm http://onramp.dot.ca.gov/hq/maint/orway/ha23/index.htm
Design Exceptions not related to the 13 controlling criteria (includes Caltrans only mandatory and Advisory Design standards. For HPP only, send copies to FHWA (no approval required). See also: http://www.dot.ca.gov/hq/oppd/pdpm/chap_pdf/chapt21.pdf	PID PA&ED	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Highway Design Manual Topic 82	http://www.dot.ca.gov/hq/oppd/hdm/pdf/english/chp0080.pdf
Technical studies related to the environmental document (e.g. Air Quality, Noise (includes Noise Abatement Decision Report – see chapter 30 of the PDPM) , Water Quality, Historical property). For HPP only, send copies to FHWA (no approval required). See section 2 of chapter 10 of the PDPM http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm	PA&ED	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Standard Environmental Guidance, (SER) Chapter 1	http://www.dot.ca.gov/ser/vol1/vol1.htm
Authority to Advertise, Award and Administer (AAA). FHWA approval required for HPP only. See chapter 2, section 5 of the PDPM: http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm, the RTL Guide: http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/, and the Local Assistance Manual (Authorization to Proceed –E-76): http://www.dot.ca.gov/hq/LocalPrograms/lam/lapm.htm Includes FHWA approval of major addenda during advertising.	PS&E Construction	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 635.112 & 625.3 Caltrans Divisions of Budgets, Office of Federal Resources	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm http://onramp/hq/budgets/fedres.shtml
NEPA approval delegated to Caltrans*. Send copy of doc. to FHWA *Except for projects listed in the MOU covering FHWA NEPA Delegation dated 6/29/07. For these FHWA retains approval and oversight. http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation/sec6005mou.pdf	PA&ED	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Sec 6005 SAFETEA-LU Caltrans Divisions of Environmental Analysis, Office of NEPA Delegation	http://www.fhwa.dot.gov/safetealu/index.htm http://www.dot.ca.gov/hq/env/nepa_pilot/index.htm
Copies of Draft Project Report and Project Report (Final) to be sent to FHWA. Applies to all HPP and other projects if requested by FHWA.	PA&ED	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Courtesy copy for FHWA regardless of approval status.	
Constructability Review (State Highway System only except for projects funded 100% by others). See Constructability guidance memo http://www.dot.ca.gov/hq/oppd/design/m052098.htm	Varies	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Documentation on RTL Cert. Form that CR did take place as required. See Appendix F of RTL Guide http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/	
Cooperative Agreements (and Cooperative Agreement Reports) for projects funded by others on the State Highway System if the construction phase is to be administered by Caltrans. Send copy to FHWA. HPP only.	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Section 5, Chapter 2 PDPM	http://www.dot.ca.gov/hq/oppd/pdpm/pdpmn.htm
Exceptions for traffic control standards contained in the Manual of Uniform Traffic Control Devises (MUTCD) and the California supplement thereto. See http://mutcd.fhwa.dot.gov/ for the MUTCD and for the CA Sup., see http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 655	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm

Exhibit 15

ITEM OF INTEREST	TYPICAL PROJECT PHASE	Applicable Completed (date)	**High Profile Project ☐ YES ☐ NO ☐ Preliminary (√ if Yes)** Initial	Date	Guidance	Web site for Guidance
Approval of PS&E. HPP only unless delegated to Caltrans. See the Construction Program Guide and the Contract Administration Core Curriculum Participant's Manual and Guidance Guide 2006: http://www.fhwa.dot.gov/construction/cqit/pse.cfm	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 205	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Copy of PS&E Memorandum and related documents (RTL Certificate and others) submitted to FHWA. HPP only unless delegated to Caltrans. See PS&E Memorandum (Appendix E of the RTL Guide). The salient portion is in the distribution section, external offices - FHWA.	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	RTL Guide	http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/RTLGuide.pdf
Copy of Construction Contract Time CPM Schedule and related documents. HPP only unless delegated to Caltrans. See Design Memo dated 2/28/01: http://www.dot.ca.gov/hq/oppd/design/m022801.pdf	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	RTL Guide	http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/RTLGuide.pdf
Copy of Construction Transportation Management Plan and related documents. Significant - HPP only unless delegated to Caltrans. For information, see Deputy Directive 60 (Caltrans INTRANET sites) http://admin.dot.ca.gov/bfams/deputydirectives/Internal/DD-60.pdf and the Caltrans Office of System Management TMP web site:	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 630.1012 See 23 CFR 630.1010 for definition of Significant	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Copy of Environmental Commitments Record, the PS&E / RTL review tool and the (PS&E) Environmental Certification form to FHWA. HPP only unless delegated to Caltrans. For more information, see the Standard Environmental Reverence, Chapter 39 and related links http://www.dot.ca.gov/ser/vol1/sec5/ch39impc/chap39.htm	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 771	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Copy of the Railroad Clearance and associated documents. HPP only unless delegated to Caltrans. See RTL Guide Section 1.3.2(e), and the Right of Way Manual (Section 8.69 and 14.03.03: http://www.dot.ca.gov/hq/row/rowman/. Note that RR Agreements are now the responsibility of the District R/W Railroad Agent – see: http://onramp.dot.ca.gov/hq/esc/sd/documents/railroad/roles_and_responsiblities_for_state_highway_projects_involving_railroads.pdf	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 646.216 and 23 CFR 635 (Subpart C)	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Copy of the Funding package. HPP only unless delegated to Caltrans. See RTL Guide, Sec. 9. The Funds Request form can be downloadad from the Office of Capital Improvement Programming (OCIP) web site: http://www.dot.ca.gov/hq/transprog/allocation_new.htm. Includes Segregated BEES estimate and Cooperative Agreements (if any). See also the PS&E Submittal Memo – FHWA distribution.	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Funding Package Guidelines	http://oe.dot.ca.gov/
Approval of Special Experimental Project – 14, Alternative Contracting. Note that SEP - 14 projects are HPP. See the FHWA web site: http://www.fhwa.dot.gov/programadmin/contracts/sep_a.cfm#s1 for information on Innovative Contracting. FHWA approval required	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 USC 112	http://uscode.house.gov/download/pls/23C1.txt
Approval of Public Private Partnership (PPP) aka Special Experimental Project – 15. Note that SEP – 15 projects are HPP. See the FHWA web site on PPP http://www.fhwa.dot.gov/ppp/index.htm for information on PPP. Enabling legislation required. FHWA approval required	Varies	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	See the Caltrans Office of Innovative Finance web site for the enabling legislation	http://www.dot.ca.gov/hq/innovfinance/Public-Private%20Partnerships/PPP_main.html

ITEM OF INTEREST	TYPICAL PROJECT PHASE	Applicable Completed (date)	High Profile Project ☐ YES ☐ NO ☐ Preliminary (√ if Yes) Initial	Date	Guidance	Web site for Guidance
E76 submittal. This is an electronic process for obtaining Federal Funds. See the Office of Federal resources (Caltrans INTRANET sites): http://onramp/hq/budgets/fedres.shtml and the Division of Accounting, Accounting Manual (Chapter 18 – Federal Program Accounting): http://onramp.dot.ca.gov/hq/accounting/Accounting_Manual/index.htm For projects funded by others, see the Division of Local Assistance: http://www.dot.ca.gov/hq/LocalPrograms/	Varies	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	See the FHWA publication: Financing Federal-aid Highways for additional information	http://www.fhwa.dot.gov/reports/financingfederalaid/financing_highways.pdf
Chapter 2 of the PDPM has an example copy of the E76 form and has additional background material.						
Concurrence by FHWA to award or reject contract. HPP only unless delegated to Caltrans. Normally the Office of Federal Resources prepares and distributes the Federal Detailed Estimate Package and obtains FHWA concurrence See RTL Guide Section 14.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	RTL Guide Section 14	http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/
Bridges w/ US Coast Guard involvement. FHWA may provide exemption from permit –see 23 CFR 650.815. FHWA approves plans where permit is required –see 23 CFR 650.807. Additional material available from US Coast Guard: http://www.uscg.mil/hq/cg5/cg5411/BPAG_2008.pdf	PID--No PA&ED PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 650.805 & 807	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
PS&E shall incorporate those noise abatement measures which are reasonable and feasible. Delegated to Caltrans. Noise abatement studies occurs at the PA&ED stage. This is a final check off that noise abatement measures are incorporated as previously determined.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 772.11(g)	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
FHWA approval/notification required for use of supplemental items or state furnished material/expenses not specifically listed as 'preapproved' by FHWA. May also require a PIF. See RTL Guide, Section 7. HPP require FHWA approval.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	RTL Guide Sec 7	http://www.dot.ca.gov/hq/esc/oe/specifications/rtl_guide/
Utility agreements - 23 CFR 645.113 and Railroad agreements - 23 CFR 646.216 require FHWA approval for HPP only unless delegated to Caltrans.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 645.113 23 CFR 646.216	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Warranties shall be approved by FHWA. See Contract Administration Core Curriculum Participant's Manual and Guidance Guide 2006: http://www.fhwa.dot.gov/programadmin/contracts/cacc.pdf. Previously considered experimental.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 635.413	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
FHWA approval of Liquidated Damages and Incentive/Disincentive payments. HPP only unless delegated to Caltrans. No approval necessary if following liquidated damages guidelines in the RTL Guide. See FHWA Contract Administration Core Curriculum Participant's Manual and Guidance Guide 2006; Time-Related Incentive/Disincentive (I/D) Provisions and Liquidated Damages for guidance: http://www.fhwa.dot.gov/programadmin/contracts/cacc.pdf	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 635.127	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Utility agreements - 23 CFR 645.113 and Railroad agreements - 23 CFR 646.216 require FHWA approval for HPP only unless delegated to Caltrans.	PS&E	☐ Yes ☐	☐ CT ☐ FHWA	☐ ☐	23 CFR 645.113 23 CFR 646.216	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm

ITEM OF INTEREST	TYPICAL PROJECT PHASE	Applicable Completed (date)	High Profile Project ☐ YES ☐ NO ☐ Preliminary (√ if Yes) Initial	Date	Guidance	Web site for Guidance
FHWA approval of significant Floodplain encroachments. See the Standard Environmental Reference (SER) Chapter 38 NEPA Delegation – Floodplains. Consult FHWA to determine significance of encroachment	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 650.105	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
FHWA Approval of Levees and Dams formed by Highway Fills. See the Highway Design Manual Index 805.5 Note that other high risk hydraulic structures may cause project to be a HPP – consult FHWA when in doubt – see first Item of Interest	PS&E	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	23 CFR 650.115	http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm
Construction Included for information only. FHWA continues to be involved during the construction process. See Construction Manual http://www.dot.ca.gov/hq/construc/manual2001/	Construction	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____	Division of Construction	http://www.dot.ca.gov/hq/construc/
Other FHWA involvement If there are other issues not covered they should be listed in a separate document and attached to this form. Typically applies to special projects with a very high degree of exposure.	Varies	☐ Yes ☐ ____	____ CT ____ FHWA	____ ____		

Additional Guidance and Instructions

FHWA
This form is intended as a reminder of those things necessary to be in place in order to secure Federal Funding or to address Federal items of interest. Items checked yes will require additional documentation. Items within the form noted as copy, are intended to remind the engineer to send a completed copy of the item noted to the FHWA. At a minimum, each project will have this form completed for each stage of the project development process. <back>

Project Phase
At a minimum this form should be completed for each project phase. Additional forms will be necessary between phases if there are major project changes. Remember that this form does not replace timely and appropriate communication with the FHWA, it only documents that the communication did take place, and the results of the communication. In most cases additional documentation will be required to complete the requirements of the FHWA policy and regulations pertaining to the Federal Highway Fund and the requirement to oversee this fund in responsible and accountable manner. <back>

HPP
A High Profile Project will require a separate agreement. These are projects of special interest to the FHWA and the Federal Highway Fund. Refer to the Supplemental to the Stewardship Agreement for complete instructions on what constitutes a High Profile Project and the handling of High Profile Projects. <back>

Stewardship
This Section is included as a reminder that many items previously handled by the FHWA are now handled by Caltrans or the local agency. Care should be exercised to verify that items necessary to secure Federal Aid Funding and or comply with other Federal Issues have been attended to. <back>

Responsibility
This is the unit that typically has ownership of the noted activity. Following the first page the Project Manager, the Project Engineer or the Design Senior / IQA Engineer can meet with the FHWA and initial besides the Caltrans box. Since this is a communication tool, all parties, including the FHWA need to be sent copies of this form whenever there are changes. The original form should be kept in the project files. <back>

Applicable and Completed (date)
If the item is applicable check the 'Yes" box. If not, leave the box unchecked. When the item is completed, check the lower box, and insert the date completed. <back>

Initial
The Caltrans and the FHWA representative should initial whenever there is a change in the form. This can come from a change in the project or a change in the project phase. For each change a new form should be prepared. Make note of the revision number and date in the upper left-hand corner of the form. <back>

Date
Insert date the initials are placed in the box to the left. <back>

Typical Project Phase
For each item, the project phase where this item is *typically* applicable is noted for information purposes. The actual Project Phase is indicated on the first sheet. The Project Manager is responsible to see that all items, regardless of typical phase, are addressed in a timely manner. Varies means that typical phase is dependent on project cost, scope and schedule, while Throughout PDP means that the section is applicable for the duration of the Project Development Process.<back>

Consultation
While the goal is to successfully obtain the funds to move forward with the transportation improvement project, this is overshadowed by the larger goal to administer the Federal Highway Funds in a responsible manner. The FWHA has been given the authority to accomplish this and needs to be involved in all projects where Federal Funds are used. In many cases this responsibility has been delegated to Caltrans. This does not diminish the need for clear and timely communication with the FHWA. Communication with the FHWA is paramount to the successful delivery of not only the particular project of interest, but also the entire Transportation Program. <back>

HPPA
Refer to the Supplemental to the Agreement on Identifying High Profile Projects and the template for a High Profile Agreement. Major Projects, those with costs exceeding $500 Million are a subset of High Profile Projects, and require a special type of agreement. The template for this type of agreement is also in the Supplemental. Once completed, send the original agreement to the Office of Federal Resources, Division of Budgets, Attention: Fardad Falakfarsa. For examples of High Profile Agreements and Major Project Agreements, see the Division of Design web page concerning the Stewardship Agreement with the FHWA: http://www.dot.ca.gov/hq/oppd/stewardship/ <back>

Administration
This portion of the Record of FHWA Stewardship form will generally require assistance from Financial Management. Except for Funding Eligibility Determinations, the FHWA has retained Approval Authority for Financial Management decisions. <back>

Right of Way
Many approvals involving Right of Way previously required from the FHWA for projects using Federal Funds have been delegated to Caltrans. The Caltrans Division of Right of Way is typically involved. Attach additional sheets if necessary to document R/W discussions. <back>

Environmental
Under NEPA Delegation, most documents requiring the FHWA approval have been delegated to Caltrans. There are some exceptions. Contact your environmental coordinator for additional information. For specific guidance see Chapter 38 of the Standard Environmental Reverence (SER) http://www.dot.ca.gov/ser/vol1/sec6/ch38nepa/chap38.htm or the noted references. Attach additional sheets if necessary. <back>

Construction
Once a project proceeds to the construction phase, Federal involvement continues. During this phase the Resident Engineer replaces the Project Engineer and the Construction Senior Replaces the Design Senior. In addition to the normal items needing the FHWA approval during this phase, if there are project changes that impact the FHWA involvement they should be addressed. If the project is High Profile, the HPP Agreement will have responsibilities delineated. <back>

APPENDIX B: PROJECT RESPONSIBILITIES LIST

Overview

The Project Responsibility List identifies the responsible agency for project level actions. It is organized by columns listed as High Profile and Delegated Projects. Within each column, activities are listed and the appropriate Approval Authority (FHWA or Caltrans) is identified. The FHWA will maintain approval authority for activities that cannot be delegated and activities that may pose a risk to individual projects. The activities with highlighted ( ) cells under the High Profile projects column, which show FHWA, may be delegated to Caltrans if the particular activity is of low risk to the project or the FAHP.

APPROVAL ACTION	Approval Authority	
	High Profile Projects	Delegated Projects NHS/Non-NHS
ADMINISTRATION		
Financial Management		
All Vouchers (progress payments and final)	FHWA	FHWA
Federal-aid Project Agreement and Modification—Preliminary Engineering through Construction [23 CFR 630.110]	FHWA	FHWA
Funding Eligibility Determinations	FHWA	Caltrans (4)
Obligate funds	FHWA	FHWA
Section 1.9 Waiver [23 CFR Section 1.9]	FHWA	FHWA
PROJECT DEVELOPMENT		
ROW		
Accept ROW certificate 3 as a condition of PS&E approval [23 CFR 635.309(c)(3)]	FHWA	FHWA
Accept ROW certificates 1 and 2 as a condition of PS&E approval [23 CFR 635.309(c)(1)&(2)]	FHWA	Caltrans
Air space agreements / Non-highway use and occupancy not on the Interstate [23 CFR 710.405]	FHWA	Caltrans
Air space agreements / Non-highway use and occupancy on the Interstate [23 CFR 710.405]	FHWA	FHWA
Control of Access [23 CFR 620.203(h)]	FHWA	FHWA
Functional Replacement [23 CFR 710.509]	FHWA	FHWA
Junkyard Control [23 CFR 751.25]	FHWA	FHWA
Outdoor Advertising Sign Removal Projects [23 CFR 750.307]	FHWA	FHWA
Protective Buying and Hardship Acquisition [23 CFR 710.307, 503]	FHWA	FHWA
Public Interest Finding (PIF) - Disposal of federally funded ROW [23 CFR 710.403, 409]	FHWA	FHWA
Railroad Agreement [23 CFR 646.216 (3)(d)]	FHWA	Caltrans
Relinquishment of a Highway Facility for continued highway purposes [23 CFR 620.201, 202, 203]	FHWA	FHWA
Request for Credits for Early Acquisition of ROW [23 CFR 710.501]	FHWA	FHWA
Request for Direct Federal Acquisition [23 CFR 710.603]	FHWA	FHWA

APPROVAL ACTION	Approval Authority	
	High Profile Projects	Delegated Projects NHS/Non-NHS
Request for Federal Land Transfer [23 CFR 710.601]	FHWA	FHWA
Request for Waivers [49 CFR 24.204(b)]	FHWA	FHWA
Utility Agreement [23 CFR 645.113, 119]	Caltrans	Caltrans
Utility Relocation [23 CFR 645 subparts A and B]	FHWA	Caltrans
Withholding of Payments [23 CFR 710.203(c), 23 CFR 1.36]	FHWA	FHWA
Environment		
Categorical Exclusion (CE) [23 CFR771.117 (c) and (d): SAFETEA-LU 6004; 23 CFR 771.117 all other CEs: SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
Certification of Public Hearing [23 CFR 771.111(h)(2)(vi)]	Caltrans	Caltrans
Draft Environmental Impact Statement (DEIS) [23 CFR 771.123; 23 CFR 771.123 (e); SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
Environmental Assessment (EA) Availability to the Public [23 CFR 771.1199(c); SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
Final Environmental Impact Statement (FEIS) [23 CFR 771.125; 23 CFR 771.125(c); SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
FEIS Legal Sufficiency [23 CFR 771.125(b); SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
Finding of No Significant Impact [23 CFR 771.121; SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
Noise Abatement [23 CFR 772]	Caltrans	Caltrans
Project-Level Transportation Conformity for CE processed under SAFETEA-LU 6004 MOU [40 CFR 93]	Caltrans (1)	Caltrans (1)
Project-Level Transportation Conformity for CE, EA and Environmental Impact Statement (EIS) processed under SAFETEA-LU 6005 MOU [40 CFR 93]	FHWA	FHWA
Record of Decision [23 CFR 771.127; SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
Re-evaluation on Approved Environmental Documents [23 CFR 771.129; SAFETEA-LU 6004 & 6005]	Caltrans (1)	Caltrans (1)
Section 4(f) *De Minimis* Determination [SAFETEA-LU 6004, 6005 & 6009, 49 USC 303]	Caltrans (1)	Caltrans (1)
Section 4(f) Individual [23 CFR 771.135; SAFETEA-LU 6004 & 6005]	Caltrans (1)	Caltrans (1)
Section 4(f) Programmatic [23 CFR 771.135; SAFETEA-LU 6004 & 6005]	Caltrans (1)	Caltrans (1)
Supplemental EIS [23 CFR 771.130; SAFETEA-LU 6005]	Caltrans (1)	Caltrans (1)
Preliminary Design		
Consultant Selection [23CFR 172.5]	FHWA	Caltrans (2)
Financial Plans for projects from $100M to $499M [SAFETEA-LU 1904]	Caltrans	Caltrans
Major ITS Project Development [23 CFR 940.11]	FHWA	FHWA
Major Projects and TIFIA Loan Projects - Project Management Plan and Financial Plan Approval [SAFETEA-LU 1904]	FHWA	FHWA
Minor ITS Project Development [23 CFR 940.11]	Caltrans	Caltrans

APPROVAL ACTION	Approval Authority	
	High Profile Projects	Delegated Projects NHS/Non-NHS
New/Modified Interstate Access Determination of Engineering and Operations Acceptability [Feb 1998 Federal Register, Vol#28 - (minor access changes delegated to Caltrans, see letter dated September 15, 1994]	FHWA (Caltrans)	FHWA (Caltrans) / N/A
PIF – Airspace Clearance FAA [CFR 620.104]	FHWA	FHWA / N/A
PIF - Use of Negotiated Consultant Contracts [23 CFR 172.5(3)]	FHWA	Caltrans
Detailed Design		
Approve preliminary plans for major and unusual structures	FHWA	Caltrans
Design Exceptions, non-Interstate (all other projects) [23 CFR 625.3]	Caltrans	Caltrans/ Local (3)
Design Exceptions on the Interstate (13 controlling Criteria) [23 CFR 625.3]	FHWA	FHWA/NA
Experimental Features (Pilot and Demo) aka CEWP, design/sequencing	FHWA	FHWA
New/Modified Interstate Access Control Change - Final Approval [Feb 1998 Federal Register, Vol#28]	FHWA	FHWA
PIF – Statewide and project specific use of proprietary products and processes [23 CFR 635.411]. If statewide, FHWA approval.	FHWA	Caltrans
PIF and Cost Justification Letter - Statewide and Project Specific - Concur in use of publicly furnished materials and expenses [23 CFR 635.407]. If statewide, FHWA approval.	FHWA	Caltrans
ROW encroachments - Use and occupancy of acquired ROW [23 CFR 710.401, HDM 504.8]	FHWA	FHWA
Value Engineering [23 CFR 627, SAFETEA-LU 1904]	Caltrans	Caltrans/ Local (3)
PS&E and Advertising		
Authorize advertising for bids [23 CFR 635.112]	FHWA	Caltrans
Authorize utility or railroad force account work [23 CFR 645.113 & 646.216]	FHWA	Caltrans
Bid Analysis (Engineer Estimates)	FHWA	Caltrans (2)
Consultant Agreements [23 CFR 172.7 - 172.9]	FHWA	Caltrans (2)
Exempt bridge from Coast Guard permit requirements [23 CFR 650.805]	FHWA	FHWA
Hiring of consultant to serve in a "management" role [23 CFR 172.9(d)]	FHWA	Caltrans
Noise - Reasonable and Feasible Determination for PS&E approval [23 CFR 772.11(g)]	Caltrans (1)	Caltrans
PIF - Advertising period less than three weeks [23 CFR 635.112]	FHWA	Caltrans
PIF - Use of contracting method other than competitive bidding [23 CFR 635.104 & 204]	FHWA	Caltrans
PIF - Use of Force Account [23 CFR 635.204, 205]	FHWA	Caltrans
PIF - Use of Mandatory Borrow/Disposal Sites [23 CFR 635.407]	FHWA	Caltrans
PIF - Use of Publicly Owned Equipment [23 CFR 635.106]	FHWA	Caltrans
PS&E [23 CFR 630.205, 23 USC 106]	FHWA	Caltrans (2)
Supplemental Work Item Justification	FHWA	Caltrans

APPROVAL ACTION	Approval Authority	
	High Profile Projects	Delegated Projects NHS/Non-NHS
Utility and railroad agreements [23 CFR 645.113 & 646.216]	FHWA	Caltrans (2)
Warranties [23 CFR 635.413]	FHWA	FHWA
Construction		
Accept Materials Certification [23 CFR 637.207]	FHWA	Caltrans (2)
Addenda during advertising period [23 CFR 635.112(c)]	FHWA	Caltrans (2)
Buy America Waiver [23 CFR 635.410, ISTEA Sec. 1041(a) & 1048(a), 41 CFR 10 (a-d)] Submit to HQ if >$50K.	FHWA	FHWA
Concur in award of contract [23 CFR 635.114]	FHWA	Caltrans (2)
Concur in rejection of all bids [23 CFR 635.114]	FHWA	Caltrans (2)
Concur in settlement of contract claims [23 CFR 635.124; C&M Manual, Chapter 2]	FHWA	Caltrans (2)
Concur in termination of contracts [23 CFR 635.125]	FHWA	Caltrans (2)
Construction engineering by local agency [23 CFR 635.105]	FHWA	Caltrans
Contract time extensions [23 CFR 635.120 & 121]	FHWA	Caltrans (2)
Final inspection/acceptance of completed work [23 USC 114(a)]	FHWA	Caltrans (2)
Incentive/Disincentive Amount Justification [23 CFR 635.127]	FHWA	Caltrans (2)
Innovative Contracting Requirements [SEP 14 & 15]	FHWA	FHWA
Liquidated Damages (rates subject to FHWA approval) [23 CFR 635.127]	FHWA	Caltrans
Major changes and extra work [23 CFR 635.120]	FHWA	Caltrans
Minor changes and extra work [23 CFR 635.120]	FHWA	Caltrans (2)
Subcontracting Requirements [23 CFR 635.116(b)]	FHWA	Caltrans (2)
Research		
Experimental Features [FAPG Ch. 6, Sect G 6042.4]	FHWA	FHWA
Emergency Relief		
ER Damage Assessments and Reports on the SHS [23 CFR 668, 23 USC 120 and 125]	FHWA	FHWA
ER Damage Assessments and Reports off the SHS [23 CFR 668; 23 USC 120 and 125; ER Q&A, Question #5 Revised DAF and #8 Coordination with Other Agencies]	FHWA/ Caltrans	Caltrans

(1) Caltrans has assumed responsibility for these items under the Section 6004 and 6005 MOUs. The FHWA will reassume responsibility should any of the applicable agreements be terminated or expire. Additionally, the FHWA remains responsible for several projects that have been excluded from the assumption of NEPA responsibilities by Caltrans.
(2) Activity is delegated to the local agency.
(3) Caltrans approval for State Highways on the Federal Aid system, local agency approval for non-State Highways on the Federal Aid system.
(4) Subject to the FHWA's Random Sampling Verification Process.

San Diego Regional HOV/Managed Lanes Systems Planning and Implementation Guide: Recommendations for the I-15/SR 78 Connector

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DATE: October 21, 2013

1. Introduction: Need for Design Guidance

The planned Interstate 15/State Route 78 (I-15/SR 78) connector will improve operations and safety at the congested system interchange in Escondido. However, there are many uncertainties to toll elements, due to the connector extending the I-15 Express Lanes (managed lanes) with a new managed lanes connector to another corridor. Key issues include:

- The phasing approach for future projects
- The locations of the Intermediate Access Points (IAPs)
- Considerations for connecting toll facilities, including High Occupancy Vehicle (HOV) requirements
- Signing

After Section 2 (existing conditions), this memorandum is divided into four main sections (3 through 6), following those elements. These sections address those issues, and are intended to provide guidance to designers and others responsible for developing the details of the proposed connectors.

2. Summary of Existing Conditions

The I-15/SR 78 connector is in northern San Diego County, in the northwestern part of the city of Escondido. West of I-15, SR 78 carries approximately 160,000 vehicles a day, on a grade-separated alignment, connecting to I-5 in Oceanside. To the east, SR 78 becomes an at-grade facility, with volumes dropping to approximately 30,000 vehicles a day in Escondido. South of SR 78, I-15 carries approximately 200,000 vehicles a day. Volumes drop to 125,000 vehicles/day north of SR 78.

The I-15 Express Lanes begin near the I-15/SR 163 interchange, and end near SR 78. There is no direct connection to SR 78 via the Express Lanes – drivers must use the general purpose (GP) connectors. Ingress and egress for these drivers is near Citracado Parkway, although there is also a Direct Access Ramp (DAR) at Hale Avenue.

I-15 Express Lane solo drivers must pay a toll. The Express Lanes use a distance-based dynamic pricing system. The toll varies based on the traffic in the Express Lanes, and drivers are charged a flat rate per mile at the time they enter the Express Lanes. Tolls are displayed on Dynamic Message Signs (DMSs) in advance of each entrance. On I-15, static signs with DMS elements are used, as illustrated in Exhibit 1. The DMS information includes the

minimum and maximum toll, plus one or more possible fares for shorter trips to upcoming freeway interchanges, such as SR 56. Not every exit point toll is shown.

Exhibit 1
DYNAMIC MESSAGE SIGNS ON I-15 EXPRESS LANES

Sign locations are south of the Carroll Canyon Parkway exit ramp and south of the Citracado Parkway exit ramp

Table 1 is a summary of occupancy data on the existing I-15 Express Lanes near Hale Avenue. A high percentage of the commuter driver population (particular southbound in the AM) is single-occupant vehicles (SOVs). These vehicles will likely be willing to use a tolled connector to SR 78.

Table 1
VOLUMES AND OCCUPANCY THE I-15 EXPRESS LANES AT HALE AVENUE (APRIL 2013 DATA)

Direction	Peak Period	Total Volume	Mode Split				
			SOV	HOV-2	HOV-3	Motorcycle	Vanpool/Bus
NB	AM Peak	441	27%	56%	9%	7%	1%
	PM Peak	3754	43%	45%	4%	4%	3%
SB	AM Peak	3738	68%	26%	2%	4%	2%
	PM Peak	1065	36%	53%	6%	4%	1%

3. Phasing Approach

Since I-15 is already a managed lanes facility, the approach for phasing the SR 78 improvements is different than most other corridors in the San Diego area. There are two basic options:

- Open the SR 78 connector as an HOV-2 facility, and convert to managed lanes (tolled) later
- Open the SR 78 connector and managed lanes as a tolled facility

The first option appears somewhat easier to design, because it does not require tolling infrastructure. However, since there are efficiencies in building the tolling elements even if it opens as HOV, it would be recommended to install much or all of that infrastructure when the facility is built. Therefore, there won't be significant cost savings with the first option. Also, the signing between an HOV (SR 78) and tolled (I-15) managed lanes system is complicated, especially if it just for an interim period. Therefore, the second option is strongly recommended.

With the second option, it is assumed that the SR 78 improvements will include the I-15 connectors and a short section of median managed lanes. In the short-term, if the SR 78 improvements occur over a relatively short section (i.e., no farther than Twin Oaks Valley Road), the SR 78 connection will effectively be an extended DAR. If managed lanes were implemented on SR 78 to the west, these segments would be tolled separately, so it could be phased as a toll or HOV segment when it is built.

Regardless of the phasing of the SR 78 improvements, the new connector should be opened as a managed lane facility.

4. Intermediate Access Points

This section documents the logic behind the recommended ingress/egress locations or IAPs, for the I-15/SR 78 connector area. The IAP locations are based upon initial discussions at a September 17, 2012 meeting with Caltrans staff, but have been updated based on current design plans. The project limits considered in this memo include the completed section of I-15 and the planned improvements on SR 78. The I-15 study area is from the Citracado Parkway interchange to the El Norte Parkway area. The current I-15 Express Lanes end just north of Valley Parkway, just north of the Hale Avenue DAR. The SR 78 study area is from the Twin Oaks Valley Road interchange to I-15.

The primary design guidance for locating IAPs is based on Caltrans' Traffic Operations Policy Directive (TOPD) 11-02. The key criteria for locating openings for buffer-separated HOV lanes are as follows:

- The start of an IAP (start dashed striping) should be located at sufficient distance from the immediate upstream on-ramp.
- The recommended distance is equal to 800 feet times the number of lane changes that a driver from the upstream on-ramp needs to make to get into the HOV lane by the end of an IAP. For a 2000-foot IAP, the upstream distance is the number of lanes times four, minus 2000 feet.
- A similar criterion applies for the end of an IAP, where the end of the dashed striping should be located at sufficient distance from the closest downstream off-ramp (800 feet per lane change, not counting the lane change out of the IAP).
- The standard length of an IAP is 2000 feet (dashed striping).

The recommended configuration IAPs are illustrated in Exhibit 2. The existing I-15 Express Lanes are shown in red, with proposed IAPs illustrated as green lines.

Four IAPs are shown on I-15 and SR 78. There is an existing IAP at the Citracado Parkway interchange on I-15. The proposed IAP at 9th Avenue/Auto Parkway and I-15 would be installed as a managed lane (Express Lane) IAP. The proposed IAPs at Nordahl Road/SR 78 and Twin Oaks Valley Road/SR 78 would be built for a combination of HOV and managed lane IAP access.

Even though the IAPs are on separate freeways, they are interrelated. Therefore, the discussion of the IAPs is organized by direction (north to west, and east to south). The operational rules for the IAPs for SOVs using the managed lane connector are discussed in Section 5, and details of the assessment of the SR 78 IAPs are included in Appendix A.

Northbound to Westbound

The existing IAP is located at Citracado Parkway, starting at station 1531+80. The length of the IAP is 2000 feet, which meets the TOPD 11-02 guidelines. The distance to the downstream off-ramp is about 5700 feet, which is more than sufficient.

A proposed IAP is located at approximately station 1608+70, immediately north of the 9th Avenue off-ramp. The start of this IAP is approximately 4200 feet north (downstream) of the on-ramp from Citracado Parkway (station 1564+30), sufficient distance for entering traffic per the TOPD 11-02 guidelines. The length of the IAP is only 2000 feet, again meeting the guidelines. Downstream, the off-ramps are 1400 feet (Valley Parkway) and 5400 feet (SR 78). The Valley Parkway distance does not meet the guidelines (4000 feet at that location), but the SR 78 ramp does meet the guidelines (2400 feet). The SR 78 volumes are much higher (combined 50,000 vehicles/day) than Valley Parkway (7700 vehicles/day).

Exhibit 2

CURRENT AND FUTURE IAP LOCATIONS ON SR 78 AND I-15

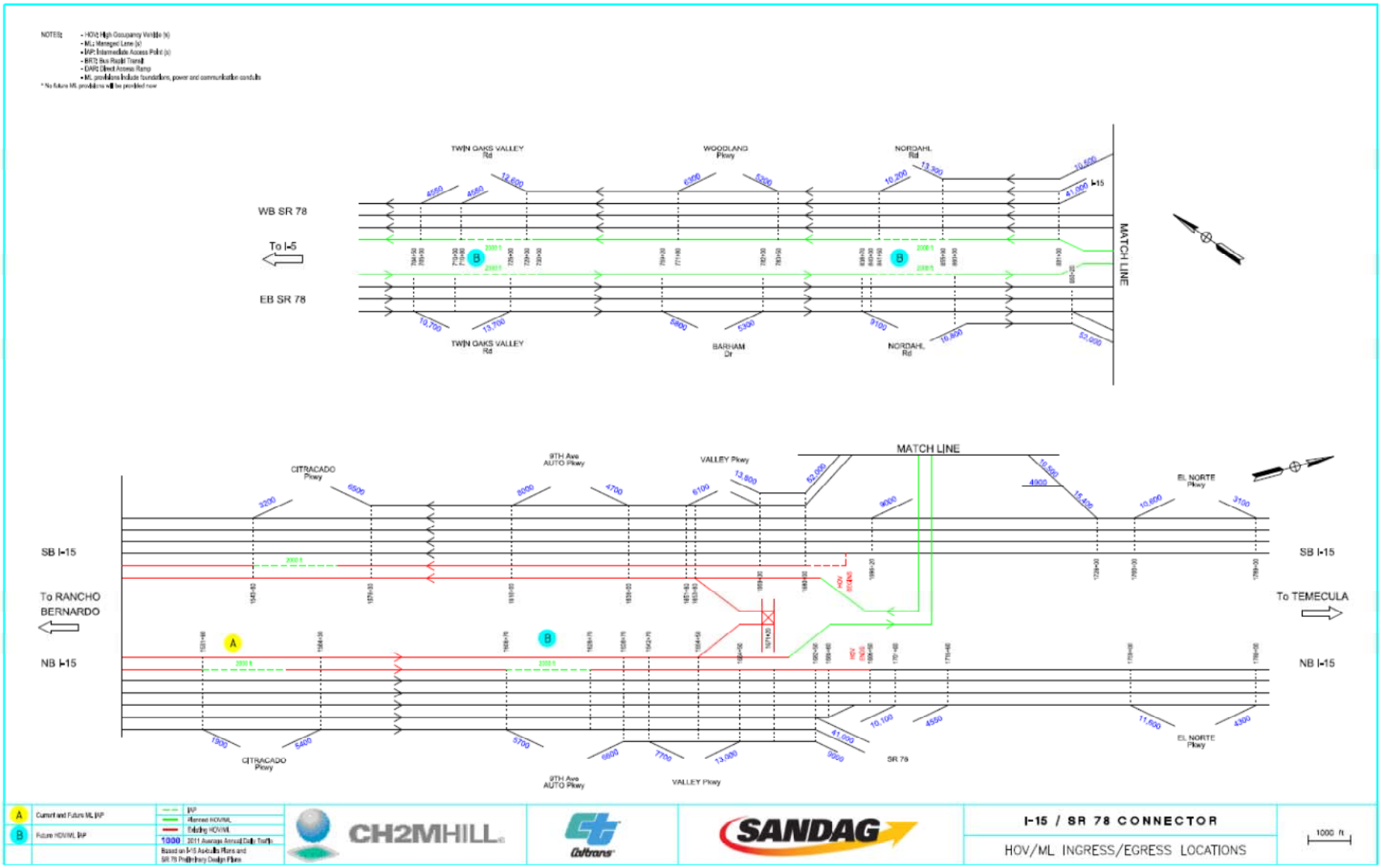


Exhibit 16

Currently, northbound traffic in the I-15 Express Lanes that wants to exit at SR 78 (or 9th Avenue and Valley Parkway) must exit the Express Lanes well upstream. The proposed IAP at 9th Avenue could be installed before the SR 78 connector is built, but that would result in high volumes of weaving traffic to SR78. The majority of the SR 78 ramp traffic is headed westbound. The opening of the connector creates an opportunity to construct a new IAP for traffic exiting to eastbound SR 78, and to allow northbound I-15 traffic to enter the Express Lanes and use the connector. Therefore, this IAP should be opened at the same time as the new I-15/SR 78 connector.

At the SR 78/Nordahl Road interchange, the start of the proposed westbound IAP is located at station 855+90. The start of the IAP is 2500 feet upstream of the I-15 connector, which is sufficient distance, because only three lane changes are needed. The length of the IAP (2000 feet), and the distance from the end of the IAP to the Barham Drive/Woodland Parkway off-ramp also meet the requirements of TOPD 11-02.

The proposed westbound Twin Oaks Valley Road IAP also meets the requirements of TOPD 11-02. The critical distance is from the Barham Drive/Woodland Parkway on-ramp to the end of the IAP (approximately 6100 feet), which is more than sufficient.

These IAPs provide operational benefits, especially coupled with the new connector. They will encourage use of the Express Lanes/HOV lane, and reduce the distance for drivers in the GP lanes. With the new connector, the weaving operations at the I-15/SR 78 interchange will be improved.

Eastbound to Southbound

On eastbound SR 78, IAPs are recommended at the Twin Oaks Valley Road and Nordahl Road interchanges. The Twin Oaks Valley Road IAP is located far enough upstream of the Barham Drive/Woodland Parkway interchange. However, there is a slight overlap (470 feet) between the Twin Oaks Valley Road entrance ramp and the end of the IAP. That overlap should be addressed in final design.

At Nordahl Road, the entry point at station 839+00 will allow for sufficient weaving distance from the Barham Road on-ramp, which is 3500 feet upstream. The 2000-foot IAP meets the TOPD guidelines. Downstream, there is 4200 feet of weaving distance to the I-15 connector, meeting the guidelines for three lane changes. Most of the managed lane traffic will be using the new I-15 connector, so weaving movements will be minimized.

There is no corresponding IAP on southbound I-15, similar to the northbound IAP at the 9th Avenue interchange. An IAP was considered at that location, but there would not be sufficient distance from the (upstream) Valley Parkway on-ramp or the (downstream) Citracado Parkway off-ramp. The lack of a southbound I-15 IAP would primarily affect the on-ramps from westbound SR 78, Valley Parkway, and 9th Avenue. Vehicles destined for the Valley Parkway, 9th Avenue, and Citracado Parkway off-ramps would not be able to use the Express Lanes on new SR 78/I-15 connector.

5. Managing Connecting Toll Facilities

The 2050 Regional Transportation Plan (RTP) includes a project to build an I-15/SR 78 HOV connector by the year 2020. Concepts and timing for building the connector were evaluated as part of the State Route 78 Corridor Study (May 2012) prepared for Caltrans, SANDAG, and the City of San Marcos. Caltrans is currently working on developing concepts for the connector and HOV lanes on SR 78. The current concept is a single-lane median-to-median connector between the two freeways. On eastbound SR 78, the single-lane HOV would trap to the connector to southbound I-15, and form the second lane on the I-15 Express Lanes. On northbound I-15, one of the two Express Lanes would trap to the connector, which would eventually form the single HOV lane on westbound SR 78. Assuming SR 78 is opened as a toll facility, the toll connections between SR 78 and I-15 have to be planned carefully.

5.1 Pricing Scheme

With two lanes in each direction, I-15 is operated as a Highway Occupancy Toll-2 (HOT-2) managed lanes system, where HOV-2s can travel free and single-occupant vehicles (SOVs) can use the Express Lanes if they pay a toll. SR 78 will only have one managed lane in each direction, but demands are expected to be low enough to allow for HOT-2 operations as well.

Since the I-15 Express Lanes work as a linear system under current operations, the pricing scheme is relatively simple. With a cost per mile, the charges to drivers are based only on the length of the segment.

While I-15 is priced "per mile", that might not be as logical for the relatively short segment of SR 78. For example, a driver on northbound I-15 from SR 163 will travel 20 miles. Another driver who starts at SR 163, and takes the I-15/SR 78 connector and leaves the Express Lanes at the Nordahl Road interchange, might travel 21 miles. At even the highest current toll ($8, or 40 cents/mile), the effective toll on the SR 78 connector will only be 40 cents. A solution may be to use a higher rate per mile on SR 78, but that may result in much higher total tolls if the managed lanes on SR 78 extend west of Barham Drive. The best solution will likely be a fixed toll on the relatively short section of SR 78 managed lanes.

5.2 Signing Issues

With higher tolls on SR 78, some drivers may choose to use the general purpose lane connectors, or the Hale Avenue DAR. They need to be informed by adequate signing on I-15. These choices will complicate the signing on I-15. The biggest issue is northbound drivers will now have an additional possible destination, (west on SR 78) with an additional associated charge. If a flat charge for the connector to SR 78 is instituted, those drivers will pay a higher toll than those continuing north on I-15. The difference in toll becomes greater as drivers enter to the north. Section 6 addresses the specifics of signing I-15.

5.3 HOV vs. Managed Lanes

The signage is relatively simple for a connector between two freeways with managed lanes operating at HOT-2. However, if the new lanes on SR 78 are operated as HOV, the system becomes somewhat more complex for occupancy requirements and, to some extent, for signing.

On SR 78, the key issue is where SOVs using the (tolled) connector must exit the HOV lane on SR 78. In the short-term, the connector might end at the Nordahl Road interchange, but if not, SOVs must be forced out of the HOV lanes on SR 78. In Los Angeles, there are direct connectors from the Express Lanes on I-110 to the HOV lanes on I-105. SOVs are allowed to use the connector, but are required to exit at the first IAP. Similar signage would be needed on SR 78.

6. Signing

In developing signing plans for managed lanes on the I-15/SR 78 connector, the key reference is the requirements for managed lanes signing, as described in the California version of the Manual of Uniform Traffic Control Devices (MUTCD). However, the MUTCD does not provide specifics on every situation, so designers must consider how to provide ample information for motorists to make route decisions and enough advance warning to enact those decisions.

This section provides an overview of the applicable MUTCD requirements that designers must take into account, and also describes the recommendations for information to be displayed to drivers using the I-15/SR 78 connector.

6.1 Information to Be Displayed on Managed Lanes Signs

Through a combination of static signs and DMSs, information sufficient to allow motorists to make an upstream decision regarding whether to use the GP or managed lanes[1] will be communicated. Informational signs should be placed well in advance of access/egress points and system interchanges (e.g., I-15/SR 78), in both directions. Sign placement should be guided by MUTCD requirements outlined in Appendix B, as well as Caltrans geometric design criteria. Additionally, guide signs should be placed in advance of, and within, access/egress points and system interchanges. These guide signs are needed to direct vehicles in entering, proceeding through and exiting the managed lanes. Guide sign criteria are also presented in Appendix B.

Information to be displayed will include:

- **Toll Rates** will be displayed on both DMSs and on static signs with a dynamic display element. Toll rates can be displayed from the intermediate access point (IAP) to the next egress point, from the IAP to major (system) interchanges, and from the IAP to the final egress point in the system.
- **Travel Times** will be displayed on both DMSs and on static signs with a dynamic display element. Both toll rates and travel times are shown in Exhibit 1. Travel times will be displayed from the IAP to the same locations where toll rates are displayed.
- **Traveler Information** will be displayed on DMSs placed throughout the freeway corridor. Traveler information could include notification of special events, weather conditions, congestion warning, and notification of diversion routes, work zone warning, and other information that may be of use to motorists
- **Incident Information** will be displayed on DMSs placed through the freeway corridor. Incident information includes notification of an incident ahead; diversion routes, incident response information, and such other information as may be useful in managing traffic during an incident.
- **Emergency Management Information** will be displayed on DMSs placed through the freeway corridor. Emergency management information includes Amber Alerts, evacuation notifications, diversion routes, suspicious activity notifications, severe weather warnings, and such other information as may be useful in managing traffic during an incident.
- **Motorist Guide Information** Guide signs may be post-mounted along the side of the roadway or gantry/mast-mounted above the roadway. Guide information directs the motorist into, through and out of the managed lanes. Multiple examples are provided in Section 3.2. Guide signs may be post-mounted along the side of the roadway or gantry/mast-mounted above the roadway. Guide information directs the motorist into, through and out of the managed lanes. Multiple examples are provided in Section 3.2.
- **Vehicle Occupancy and Restrictions** (e.g., Highway Occupancy Vehicle (HOV)), and vehicle restrictions (e.g., “no trucks”) will be displayed primarily on static signs, both post-mounted and overhead, throughout the project footprint. Signs will be placed well in advance of the point where the requirements or restrictions are in effect. Details of the placement of these signs are provided in Section 3.2.

[1] The generic term “managed lanes” is used to refer to the existing I-15 Express Lanes, and any new managed lanes (HOV or HOT) on SR 78, as well as the I-15/SR 78 connector.

6.2 Guidance for Signing the I-15/SR 78 Connector

The new managed lanes I-15/SR 78 connector will necessitate signing changes at multiple locations:

- An ingress location for the northbound I-15 IAP near the I-15/SR 78 connector
- All ingress points along the northbound I-15 Express Lanes
- The access point for southbound I-15 from the I-15/SR 78 connector, and further upstream on SR 78.

General guidance is provided in Section 6.2.1. The signage for northbound I-15 is addressed in Section 6.2.2, and the signage for SR 78 is addressed in Section 6.2.3.

6.2.1 General Guidance

For guide sign panels identifying destination, a standard positive contrast sign with green background and white lettering is recommended. The color format for the top banner follows the guidelines from the California version of the MUTCD. The toll pricing hybrid panel sign follows the standard regulatory format with black lettering on white background. These signs are consistent with the current signs on the I-15 Express Lanes.

Signs should follow the standard spacing recommended by the MUTCD. During the preliminary design phase, a determination can be made on the feasibility to combine sign infrastructure by co-locating sign supports with existing sign supports. During this phase, the residual capacity of the existing sign structures can be assessed to determine the possibility of co-locating sign structures. A minimum spacing of 800 feet will be required for all overhead signs.

6.2.2 I-15 Express Lanes and the Northbound I-15 to Westbound SR 78 Connector

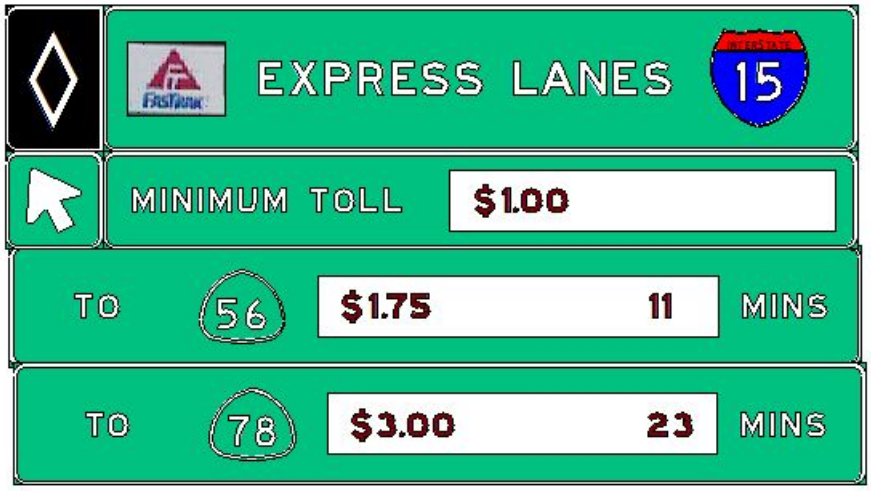
A hybrid design is used for the existing signs at all access points to the I-15 Express Lanes. A minimum toll is displayed on a top panel using a Dynamic Message Sign. The bottom panel displays the destination with the associated pricing and the travel time required to the destination. Due to the addition of I-15/SR 78 connector and the need to toll the connector, existing signing will need to be modified to include the new destination.

Two sets of advance guide signs will be required. The first set of guide signs will direct drivers who will be entering the I-15 Express Lanes, and may be driving to destinations other than SR 78. The second set of guide signs will provide route guidance to northbound I-15 drivers to use either the new SR 78 connector or stay in the I-15 Express Lanes and ultimately transition into the northbound GP lanes.

South End Signs

Exhibit 3 is the proposed guide sign for northbound vehicles entering the Express Lanes south of SR 56. This sign should be used for traffic entering the Express Lanes from I-15 or SR 163; from the IAPs near Miramar Road, Carroll Canyon Road; and from the direct access ramps (DARs) at Sabre Springs and (future) Hilary Drive.

Exhibit 3
SIGNING OPTION FOR MULTIPLE DESTINATIONS (SOUTH END OF I-15)



Drivers destined for the north end of I-15 (i.e., to Escondido or beyond) or SR 78 (via the new connector) will both see the "TO 78" designation as applying to them. The pricing (and to a lesser extent, the travel time) will only be accurate for one of them. Since these drivers will be traveling a relatively long distance (12 to 20 miles) the difference between the prices will be relatively small.

North End Signs

Exhibits 4 and 5 illustrate the proposed guide signs for northbound vehicles entering the Express Lanes north of SR 56. These signs should be used for traffic entering from the IAPs near SR 56, Camino Del Norte, Duenda Road, and Citracado Parkway; and from the DARs at Rancho Bernardo, Del Lago, or Hale Avenue.

Exhibit 4
SIGNING OPTIONS FOR MULTIPLE DESTINATIONS (NORTH END OF I-15)

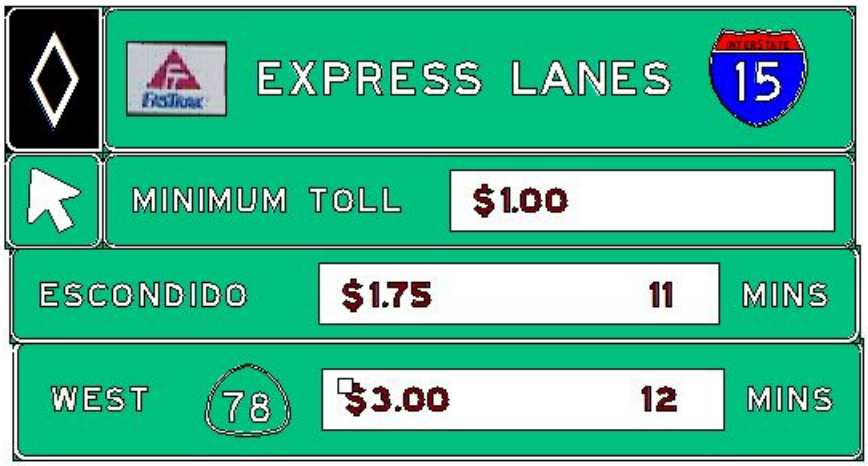
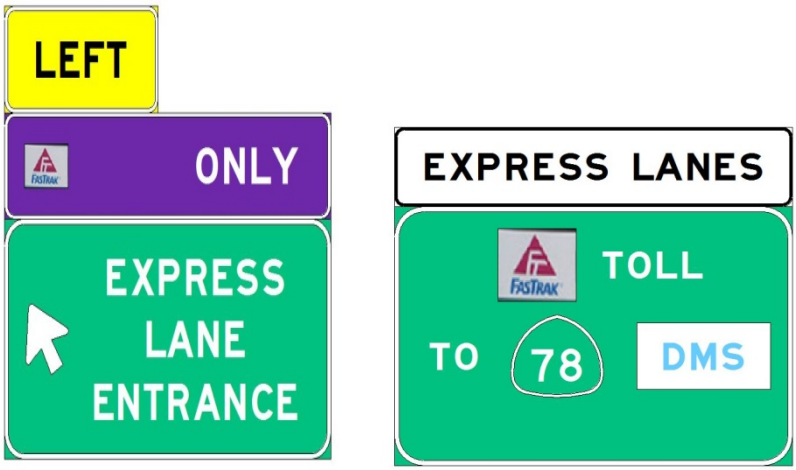


Exhibit 5
SIGNING OPTIONS FOR SINGLE DESTINATIONS (NORTH END OF I-15)

The signs in Exhibits 4 and 5 can be used interchangeably. The two-destination version in Exhibit 4 differentiates the toll between staying on I-15 and using the I-15/SR 78 connector. This sign is preferred, but the sign in Exhibit 5 may be used for locations where less space is available. It will only show the toll and travel time to "Escondido", which could be I-15 or SR 78.

Exhibit 6 shows the signs to the SR 78 connector, at the north end of I-15. The toll for the connector will be shown on a DMS element of a static sign.

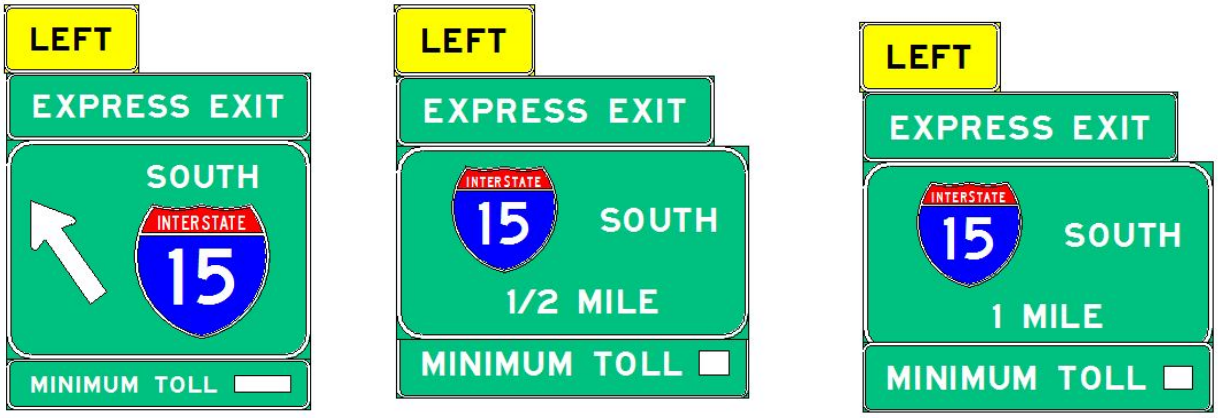
Exhibit 6
SIGNS FOR WESTBOUND SR 78 CONNECTOR



6.2.3 Eastbound SR 78 Connector to the Southbound I-15 Express Lanes

With the I-15/SR 78 connector, a new set of standard Express Lanes access signs will be required. The minimum toll to access the connector to connect to southbound I-15 Express Lanes will be displayed on the bottom panel DMS. Exhibit 7 presents the proposed guide signs approaching the southbound I-15 Express Lanes using the new SR 78 connector.

Exhibit 7
SIGNS FOR EASTBOUND SR 78 CONNECTOR TO SOUTHBOUND I-15



7. Summary of Recommendations

Based on the preliminary assessment of SR 78 managed lanes, and discussions with Caltrans, the following recommendations are offered for consideration in the SR 78 planning documents:

- Include IAPs in both directions on SR 78 at the Nordahl Road and Twin Oaks Valley Road interchanges.
- Include a new IAP on northbound I-15 at the 9th Avenue/Auto Parkway interchange. A similar IAP can be considered in the southbound direction, but is not recommended without further study.
- Toll the I-15/SR 78 connector at opening day, and allow for HOV-2s to ride free.
- Develop a standard flat rate tolling approach for SR 78.
- Identify signing plan requirements for I-15 (throughout the corridor) and the connector. The current I-15 Express Lanes signing approach will need to be updated when SR 78 opens, including changes to existing signs.

Appendix A – IAP Assessment

Caltrans has already identified preliminary locations for IAPs along SR 78. The eastbound locations are at:

- El Camino Real
- Plaza Drive
- Melrose Drive
- Escondido Avenue
- Rancho Santa Fe Road
- Twin Oaks Valley Road
- Nordahl Road

The westbound locations are at:

- Nordahl Road
- Twin Oaks Valley Road
- Rancho Santa Fe Road
- Escondido Avenue
- Melrose Drive
- Vista Way
- El Camino Real

The primary design guidance for locating IAPs is based on Caltrans' Traffic Operations Policy Directive (TOPD) 11-02. The key criteria for locating openings for buffer-separated HOV lanes are as follows:

- The start of an IAP (start dashed striping) should be located at sufficient distance from the immediate upstream on-ramp.
- The recommended distance is equal to 800 feet times the number of lane changes that a driver from the upstream on-ramp needs to make to get into the HOV lane by the end of an IAP. For a 2000-foot IAP, the upstream distance is the number of lanes times four, minus 2000 feet.
- A similar criterion applies for the end of an IAP, where the end of the dashed striping should be located at sufficient distance from the closest downstream off-ramp (800 feet per lane change, not counting the lane change out of the IAP).
- The standard length of an IAP is 2000 feet (dashed striping).

As part of the assessment of IAPs on all the corridors, these IAP locations were reviewed. Exhibit A-1 is a summary of the analysis. There are four parts to the attachments: two tables for the entrance ramps (eastbound and westbound) and two tables for the exit ramps. For the entrance ramps (on the left side), the distance from the ramp to the downstream IAP is determined. For the exit ramps, the distance from the upstream IAP to the exit ramp is determined.

There were two considerations in evaluating the IAPs:

- There should be sufficient IAPs so that these distances are not too large (especially for high-volume ramps). Otherwise, the HOV/managed lanes may be underutilized, because some drivers will not be able to use the HOV/managed lanes efficiently.
- If the distances are too short, the location may not meet the design guidance in TOPD 11-02.

In general, there are a sufficient number of IAPs. The average (volume-weighted) distance between the IAP and the immediate upstream/downstream ramp is approximately 1.3 miles. The only section where an additional IAP could be considered is between Rancho Santa Fe Road and Escondido Avenue IAPs. There are two interchanges and approximately 3.7 miles separating these two IAPs. The Sycamore Road interchange would be a

potential additional location. However, the longest distance any driver will need to take to an IAP is just over 3 miles, so additional IAPs are not critical

Some of the IAPs are too close to upstream and downstream ramps. These are highlighted in blue in Exhibit A-1. For example, the eastbound Escondido Avenue entrance ramp overlaps with the IAP (approximately 260 feet). Entering drivers could weave across four lanes to the IAP. The examples of overlapping IAPs and entrance ramps are:

- Eastbound Escondido Avenue (260 feet)
- Eastbound Twin Oaks Valley Road (470 feet)
- Eastbound Nordahl Road (450 feet)
- Westbound Los Posa Road/Rancho Santa Fe Road (1250 feet)
- Westbound Vista Village Drive (1740 feet)

There are two examples of overlapping IAPs and exit ramps:

- The Plaza Drive IAP starts 1260 feet before the eastbound exit ramp
- The Vista Village Drive IAP starts 1640 feet before the eastbound exit ramp

There are three other issues with exit ramps. The Grand Avenue exit ramp is only 1630 feet downstream from the Rancho Santa Fe Road IAP. Three lanes changes are needed, so that location would not meet the TOPD 11-02 guidance (2400 feet). The volumes at that exit ramp are relatively high (1240 vehicles in the peak hour, but the next IAP is nearly 3 miles upstream (at Escondido Avenue). There are similar issues at the eastbound I-15 connector (too close to the Nordahl Road IAP), and the westbound Vista Village Drive exit ramp (too close to the Escondido Avenue IAP).

A detailed assessment of the IAPs versus the TOPD 11-02 guidance is needed as part of the design process.

Exhibit A-1
IAP Assessment

Eastbound Entrance Ramps

Entrance Ramp	Station	Peak	Downstream IAP	Station	Lane Changes	Distance	Volume-Distance
I-5	43.5	1950	El Camino Real	127	3	8350	3084
Jefferson	87	480	El Camino Real	127	4	4000	364
El Camino Real	122	1350	Plaza	220	4	9800	2506
Plaza	225.3	1190	Melrose	350	4	12470	2810
Emerald	271.8	1280	Melrose	350	4	7820	1896
Vista Village	372.5	1920	Escondido	405	4	3250	1182
Escondido	402.4	1330	Escondido	405	4	260	65
Mar Vista	447.6	380	Rancho Santa Fe	600	4	15240	1097
Sycamore	523	1430	Rancho Santa Fe	600	4	7700	2085
Rancho Santa Fe	599.7	780	Twin Oaks Valley	730	4	13030	1925
Grand	655.5	740	Twin Oaks Valley	730	4	7450	1044
San Marcos	685.3	1400	Twin Oaks Valley	730	4	4470	1185
Twin Oaks Valley	725.3	1330	Twin Oaks Valley	730	4	470	118
Woodland/Barham	782	450	Nordahl	860	4	7800	665
Nordahl	855.5	980	Nordahl	860	4	450	84
	total	**16990**	**(average 1100)**				20110
						Average distance from on-ramp to first IAP:	1.18 miles

Westbound Entrance Ramps

Entrance Ramp	Station	Peak	Downstream IAP	Station	Lane Changes	Distance	Volume-Distance
I-15	881	4700	Nordahl	840	3	4100	3650
Nordahl	840	1020	Twin Oaks Valley	710	5	13000	2511
Woodland/Barham	771.8	600	Twin Oaks Valley	710	4	6180	702
Twin Oaks Valley1	710.8	590	Rancho Santa Fe	580	4	13080	1462
Twin Oaks Valley2	705	470	Rancho Santa Fe	580	4	12500	1113
San Marcos	661.1	400	Rancho Santa Fe	580	4	8110	614
Las Posas/RSF	592.5	780	Rancho Santa Fe	580	3	1250	185
Rancho Santa Fe	573.5	920	Escondido	385	4	18850	3284
Sycamore	495.5	1060	Escondido	385	4	11050	2218
Mar Vista	425	600	Escondido	385	4	4000	455
Escondido	387.9	810	Melrose	330	4	5790	888
Vista Village	347.4	820	Melrose	330	3	1740	270
Melrose	330.5	1070	Vista	200	4	13050	2645
Emerald	252.3	710	Vista	200	4	5230	703
Vista	203.6	370	El Camino Real	107	3	9660	677
Rancho Del Oro	194.7	780	El Camino Real	107	4	8770	1296
	total	**15700**	**(average 1000)**				22673
						Average distance from on-ramp to first IAP:	1.44 miles

470
distances that may be less than required by TOPD 11-02

Eastbound Exit Ramps

Exit Ramp	Station	Peak	Upstream IAP	Station	Lane Changes	Distance	Volume-Distance
College	193.7	1780	El Camino Real	127	3	6670	2249
Plaza	212.6	290	Plaza	220	2	-740	-41
Emerald	249.5	560	Plaza	220	3	2950	313
Melrose	329.9	840	Plaza	220	3	10990	1748
Vista Village	346.4	660	Melrose	350	2	-360	-45
Escondido	383.7	660	Melrose	350	3	3370	421
Mar Vista	429.5	320	Escondido	405	3	2450	148
Sycamore	500.4	1590	Escondido	405	3	9540	2873
Rancho Santa Fe	575.3	1170	Escondido	405	3	17030	3774
Grand	616.3	1240	Rancho Santa Fe	600	3	1630	383
San Marcos	662.7	510	Rancho Santa Fe	600	3	6270	606
Twin Oaks Valley	704.5	1460	Rancho Santa Fe	600	2	10450	2890
Woodland/Barham	759.2	710	Twin Oaks Valley	730	3	2920	393
Nordahl	838.7	1060	Twin Oaks Valley	730	3	10870	2182
I-15	883.2	2660	Nordahl	860	3	2320	1169
	total	**15510**	**(average 1000)**				19062
						Average distance from nearest IAP to exit ramp:	1.23 miles

Westbound Exit Ramps

Exit Ramp	Station	Peak	Upstream IAP	Station	Lane Changes	Distance	Volume-Distance
Woodland/Barham	783.5	450	Norhdahl	840	3	5650	482
Twin Oaks Vzalley	729	1440	Norhdahl	840	3	11100	3027
San Marcos	690.5	1860	Twin Oaks Valley	710	2	1950	687
Grand	636	980	Twin Oaks Valley	710	3	7400	1373
Las Posas/RSF	618.8	1330	Twin Oaks Valley	710	2	9120	2297
Sycamore	521	1290	Rancho Santa Fe	580	2	5900	1441
Mar Vista	449.2	220	Rancho Santa Fe	580	3	13080	545
Escondido	409.8	660	Rancho Santa Fe	580	3	17020	2128
Vista Village	369.7	1530	Escondido	385	2	1530	443
Emerald	275	1060	Melrose	330	3	5500	1104
Vista	222.5	810	Melrose	330	3	10750	1649
Rancho del Oro	121.3	1320	College	200	3	7870	1968
Jefferson	80.5	740	El Camino Real	107	3	2650	371
I-5	42.5	1950	El Camino Real	107	2	6450	2382
	total	**15640**	**(average 1100)**				19898
						Average distance from nearest IAP to exit ramp:	1.27 miles

Exhibit 16

Appendix B –Signing Managed Lanes

B.1 MUTCD Requirements for Managed Lanes Signing

The California version of the MUTCD provides detailed wide-ranging direction for managed lanes signing. The MUTCD uses the term "preferential lane", so that term will be used interchangeably in this section. The exhibits included below are taken from the MUTCD.

B.1.1 General Requirements for Managed Lanes

This section outlines general requirements for all types of managed lanes, including HOV, Highway Occupancy Toll (HOT) and tolled-only lanes.

B.1.1.1 Static Sign Types and Sizes

The MUTCD provides that when a preferential lane is established, the Preferential Lane regulatory signs (shown as Figure 2G-1 in the MUTCD, reproduced in Appendix A) and pavement markings for these lanes shall be used to advise road users. Preferential Lane (R3-15 series, R82B(CA) through R88(CA), R91(CA) series through R94(CA), SR50(CA) series and the SR60(CA) series) regulatory signs consist of several different general types of regulatory signs as follows (see MUTCD Figure 2G-1 and Figure 2G-1(CA) in Appendix A):

- Vehicle Occupancy Definition signs define the vehicle occupancy requirements applicable to an HOV lane (such as "2 OR MORE PERSONS PER VEHICLE") or types of vehicles not meeting minimum occupancy requirement (such as motorcycles or ILEVs) that are allowed to use an HOV lane
- Periods of Operation signs notify road users that a preferential lane restriction begins ahead
- Preferential Lane Advance signs notify road users that a preferential lane restriction begins ahead.
- Preferential Lane Ends signs notify users of the termination point of the preferential lane restrictions.

B.1.1.2 Dynamic Message Signs (Changeable Message Signs)

Dynamic message signs (described in the MUTCD as "Changeable Message Signs") may supplement, substitute for, or be incorporated into static preferential lane regulatory sings where travel conditions change or where multiple types of operational strategies (such as variable occupancy requirements or vehicle types) are used and varied throughout the day or week, or on a real-time basis, to manage the use of, control of, or access to preferential lanes. MUTCD Figure 2G-1 illustrates examples of changeable messages incorporated into static Preferential Lane regulatory signs.

B.1.1.3 Placement of Signs

Regulatory Signs applicable only to a preferential lane, shall be distinguished from regulatory sings applicable to general-purpose lanes, by the inclusion of the applicable symbol(s) and/or word(s) (see MUTCD Figure 2G-1 and Figure 2G-1(CA)). The symbol and word message displayed on a particular Preferential lane regulatory sign will vary based on the specific type of allowed traffic, and on other related operational constraints, that have been established for a particular lane such as an HOV lane, a bus lane, or a taxi lane. Changeable message signs may supplement, substitute for, or be incorporated into static Preferential Lane regulatory signs where travel conditions change, or where multiple types of operational strategies (variable occupancy requirements or vehicle types) are used and varied throughout the day or week, or on a real-time basis, to manage the use of, control of, or access to preferential lanes. MUTCD Figure 2G-1 illustrates examples of changeable messages incorporated into static Preferential Lane regulatory signs.

If used, overhead preferential lane (MUTCD R3-13 series, R3-14 series, and R3-15 series) regulatory signs shall be installed on the side of the roadway where the entrance to the preferential lane is located and any appropriate

adjustments shall be made to the sign message. Where a median of sufficient width is available, the R3-13 series and R3-15 series signs may be post-mounted. The sizes for Preferential Lane regulatory signs will differ to reflect the design speeds for each type of roadway facility. Table 2G-1 the Attachment to Appendix B provides sizes for each type of roadway facility. The edges of Preferential Lane regulatory signs post-mounted on a median barrier, should not project beyond the outer edges of the barrier, including in areas where lateral clearance is limited. If lateral clearance is limited, the post-mounted Preferential Lane regulatory signs on median barriers that are 72 inches or less in width may be skewed up to 45 degrees, in order to fit within the barrier width. Also, they may be mounted higher such that the vertical clearance to the bottom of the sign, light fixture, or structural support—whichever is lowest—is not less than 14 feet above any portion of the pavement and shoulders.

Preferential Lane regulatory signs where lateral clearance is limited, post-mounted on a median barrier, and wider than 72 inches, shall be mounted with a vertical clearance that complies with the provisions provided in Section 2A.18 of the Federal MUTCD. On conventional roadways, Preferential Lane regulatory sign spacing should be determined by engineering judgment based on speed, block length, distances from adjacent intersections, and other site-specific considerations.

B.2.1 Specific Requirements for Toll Lane Facilities

Priced managed lanes that are adjacent to general purpose lanes along the same designated route shall be signed using the legend “EXPRESS” or “EXPRESS LANE(S)”. This provision applies when any of the following operational strategies is used for a managed lane:

- All users of the managed lane are charged a fixed or variable toll;
- GP traffic using the managed lane is charged a fixed or variable toll, but HOV traffic is allowed to travel without being charged a toll on either a full or part-time basis;
- GP traffic using the managed lane is charged a fixed or variable toll, but HOV traffic is offered a discounted toll on either a full or part-time basis; or
- GP traffic using the managed lane is charged a fixed or variable toll, but HOV traffic registered with a local program travels at a discounted toll or without being charged a toll on either a full or part-time basis (a transponder or other identifier is typically required of HOVs to indicate registration in conjunction with electronic or visual enforcement and verification of vehicle occupancy).

The legends “EXPRESS“ and “EXPRESS LANE(S) “ shall not be used on signs for entrances to highways on which all lanes are managed and there are no adjacent GP lanes on the same designated route. The legends “EXPRESS“ and “EXPRESS LANE(S) “ shall not be used on signs for a managed ramp connection that provides an alternative to a GP ramp connection, except where the ramp leads directly to a managed lane. The legends “EXPRESS“ and “EXPRESS LANE(S) “ shall not be used on signs for open-road tolling lanes that bypass a conventional toll plaza.

B.2.1.1 Toll Notification

Regulatory signs shall be used to indicate the toll charged. If the toll varies, regulatory signs that include changeable message elements, such as the R3-48 and R3-48a signs that are shown in MUTCD Figure 2G-17, shall be used to display the actual toll amount in effect at any given time. When only vehicles with a registered electronic toll collection (ETC) account are allowed to use a managed lane where some or all vehicles are charged a toll, regulatory signs to indicate such a restriction shall be provided and shall incorporate the pictograph adopted by the toll facility’s ETC payment system and the word ONLY. When HOV traffic is allowed to use a priced managed lane without paying a toll and registration in a local program is not required to receive the toll exemption, the Vehicle Occupancy Definition (R3-10 or R3-13) signs shall be modified to delete the diamond symbol to create priced managed lane Vehicle Occupancy Definition (R3-40 and R3-43) signs to indicate the minimum occupancy related to the management strategy (see MUTCD Figure 2G-17). A priced managed lane Periods of Operation (R3-44 or R3-44a) sign (see MUTCD Figure 2G-17) shall be installed at the beginning or initial

entry point, and at any intermediate entry points where vehicles are allowed to legally enter an access-restricted priced managed lane. When the vehicle occupancy required for non-toll use of a managed lane is varied as a part of a priced managed lane operational strategy, regulatory signs that include changeable message elements shall be used to display the required vehicle occupancy in effect for non-toll travel. Where registration in a local program or ETC account is required for HOV traffic to travel in a priced managed lane without being charged a toll or by being charged a discounted toll, such information may be displayed on a separate sign within the sequence of the required regulatory and guide signs.

R3-42 Series and R3-45 Series signs (MUTCD Figure 2G-17 is shown in Figure B-2) shall be installed as stated above to indicate the termination of a priced managed lane or restriction. The R3-42, R3-42a, and R3-45 signs shall be used only where the managed lane and restriction end and traffic must merge into the general-purpose lanes. The R3-42b, R3-42c, and R3-45a signs shall be used only where the managed lane restriction ends, and the lane becomes a general-purpose lane.

Comparative travel time can be provided along with toll notification. Exhibit B-1 is an example of a typical travel time sign.

Exhibit B-1
COMPARATIVE TRAVEL TIME SIGN

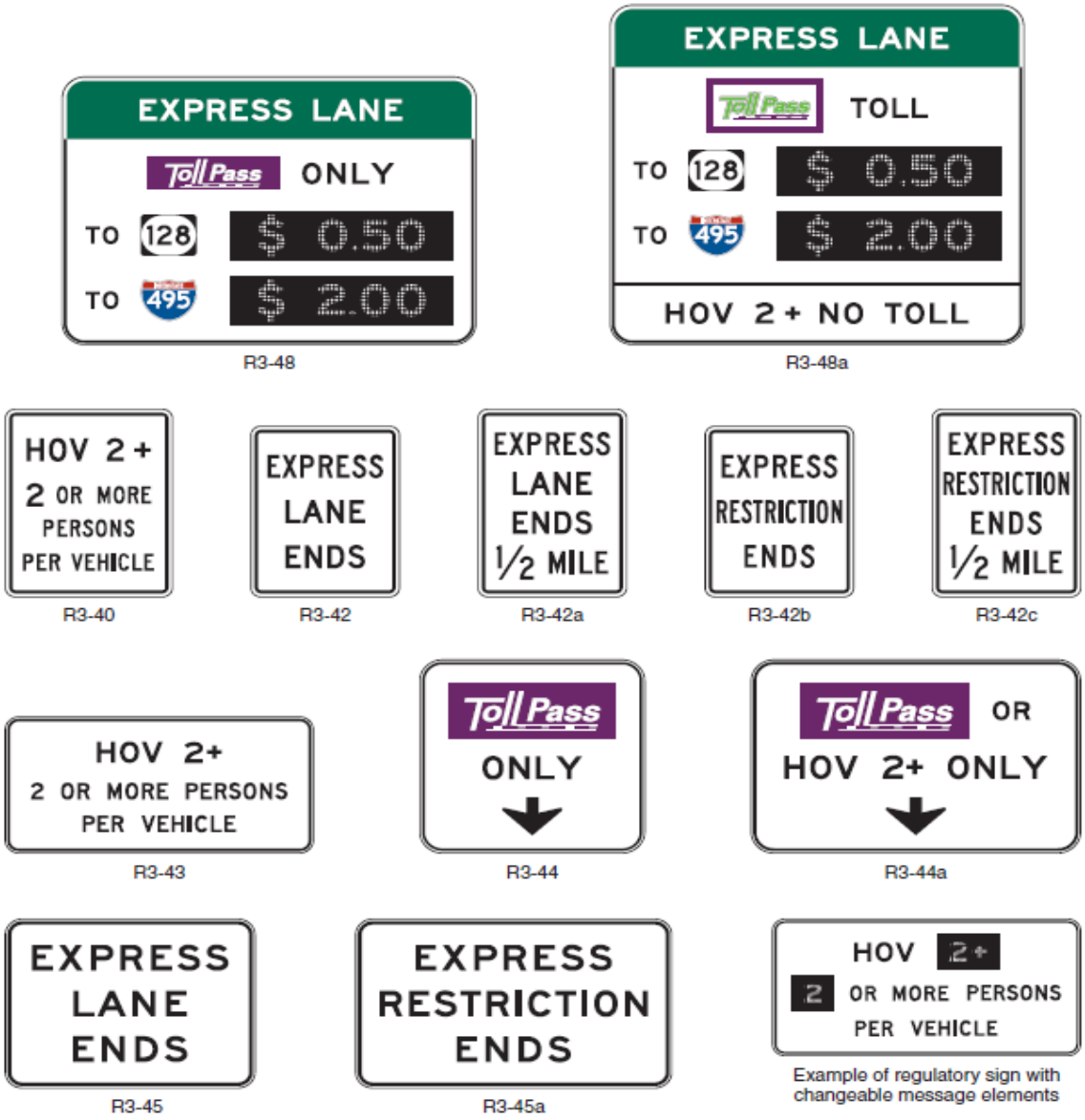
B.2.1.2 Guide Signs

Guide signs help motorists navigate interchange between the GP and managed lanes. Detail on MUTCD requirements for type, size, and appearance of guide signs, along with typical signing plans, can be found in the Attachment to Appendix B.

Exhibit B-3 indicates how guide signing should be applied to indicate a freeway-to-freeway managed lane movement such as will be in place for I-15/SR 78.

Exhibit B-2

MUTCD FIGURE 2G-17: REGULATORY SIGNS FOR MANAGED LANES



Notes:

1. The ETC pictograph shown is an example only. The pictograph for the toll facility's adopted ETC system shall be used.
2. Changeable message sign elements shall be used for the numerals displayed for the variable tolls.

Exhibit B-3

MUTCD FIGURE 2G-27: EXAMPLES OF GUIDE SIGNS FOR A DIRECT ACCESS RAMP BETWEEN MANAGED LANES ON SEPARATE FREEWAYS

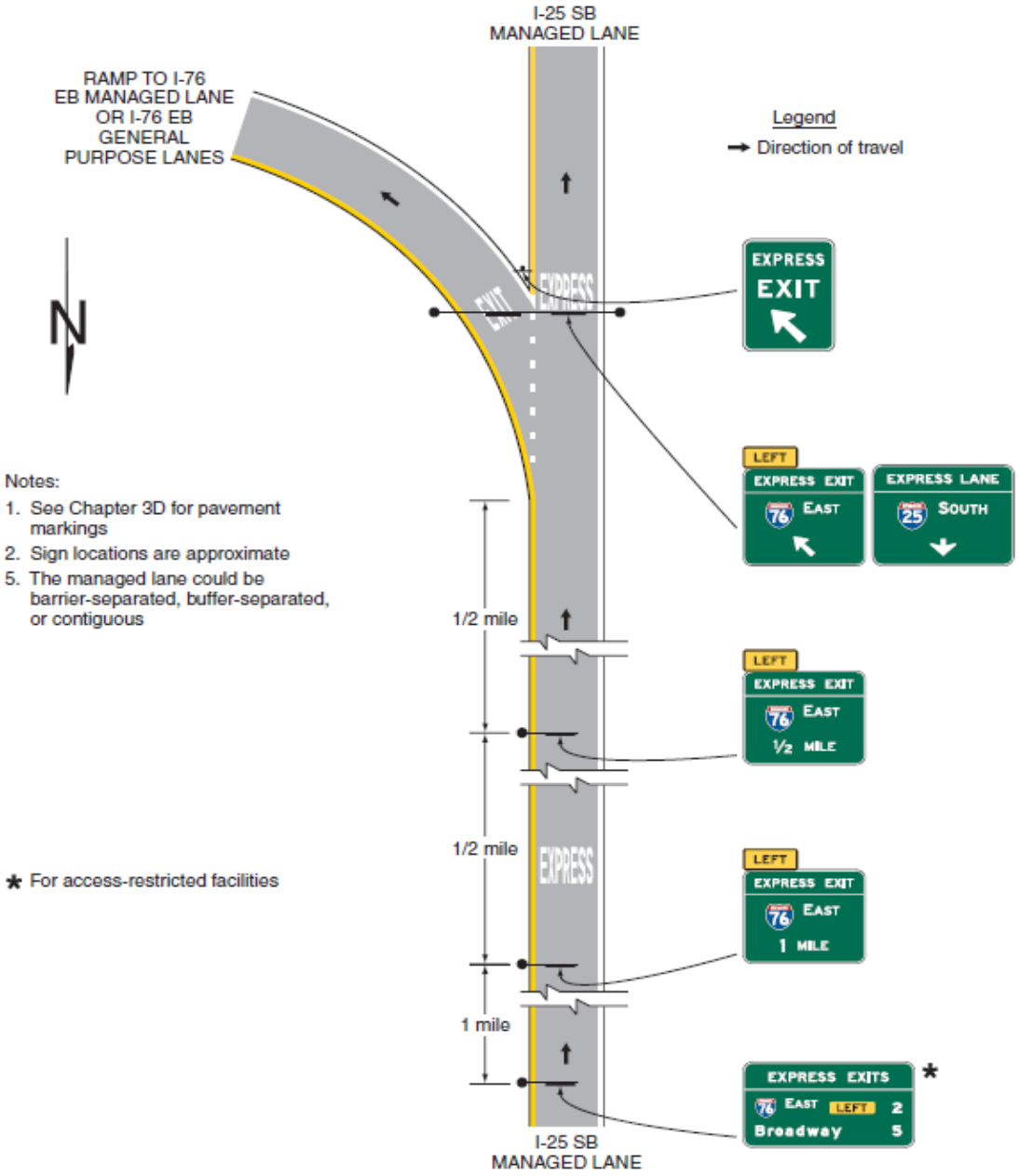


Exhibit 16

B.2 Other U.S. Examples

B.2.1 Springfield Interchange, Northern Virginia

The Springfield interchange connects the Capital Beltway (I-495), I-95 and I-395. The Capital Beltway has two managed lanes that carry through the interchange. Managed lanes on I-95/I-395 are currently under construction and will connect directly with the managed lanes on the Beltway. Exhibit B-4 is the signing plan for the Springfield interchange, providing the direct connection between the managed lanes systems

Exhibit B-4
SPRINGFIELD INTERCHANGE SIGNING PLAN

B.2.2 I-35 Minneapolis Managed Lanes

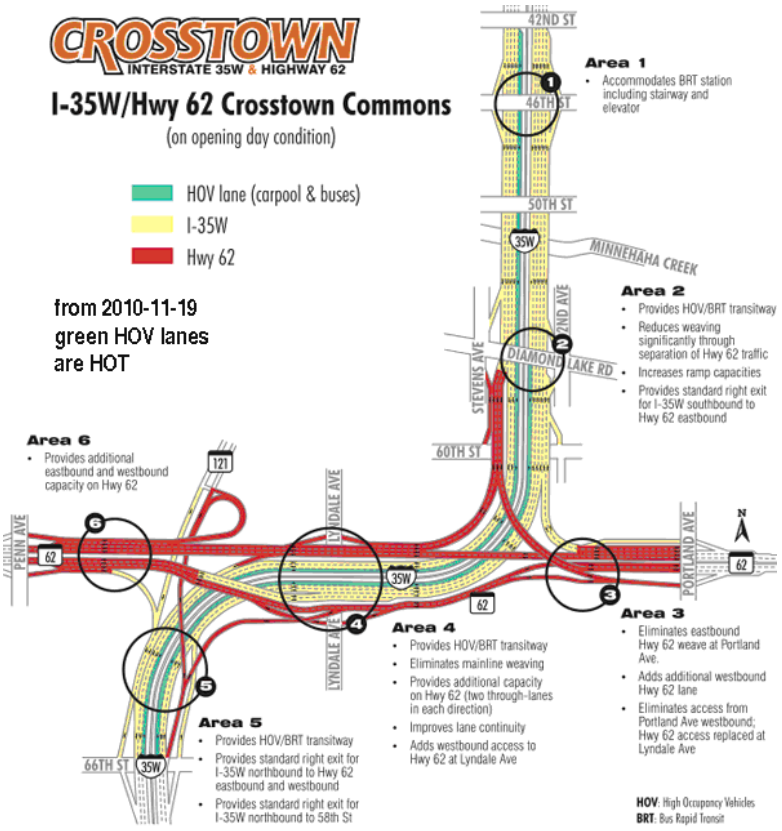
Exhibit B-5 illustrates system information and signing from the managed lane system on I-35 in Minneapolis (additional narrative coming).

B.2.3 I-25 Denver Managed Lanes

Exhibit B-6 illustrates system information and signing from the managed lane system on I-25 in Denver (additional narrative coming).

Exhibit B-5

EXAMPLE SIGNS AND BACKGROUND INFORMATION ON I-35 MANAGED LANES (MINNEAPOLIS)



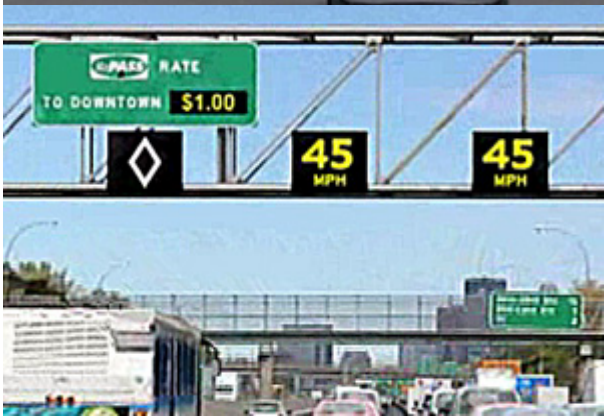


Exhibit 16

Exhibit B-6

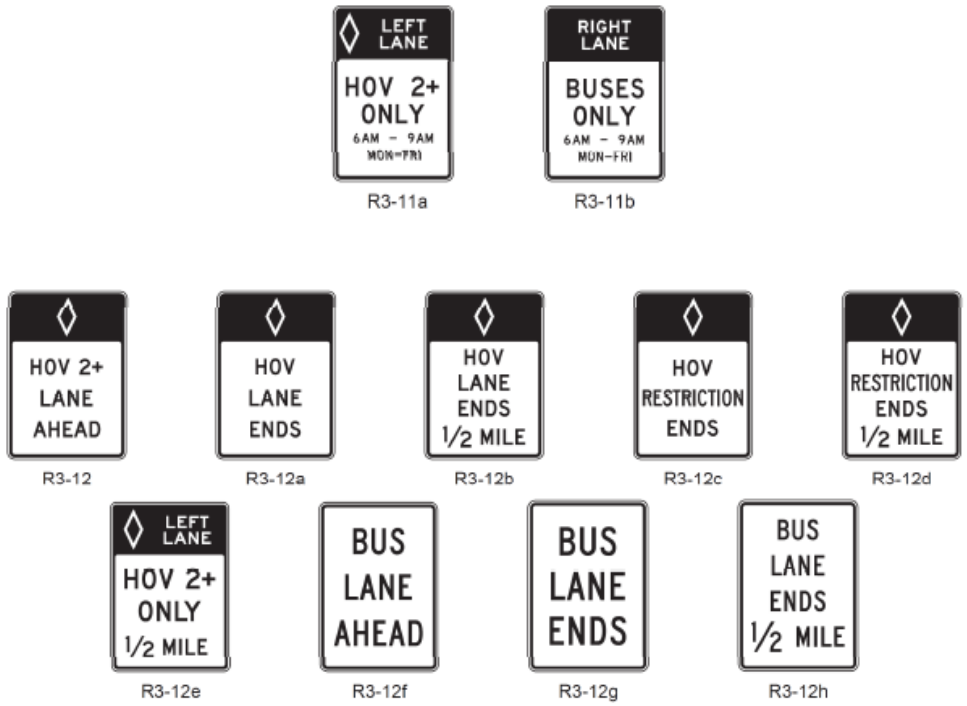
EXAMPLE SIGNS AND BACKGROUND INFORMATION ON I-25 MANAGED LANES (DENVER)

Exhibit 16

Attachment to Appendix B - MUTCD Requirements for Managed Lanes Signing

Supplemental Material

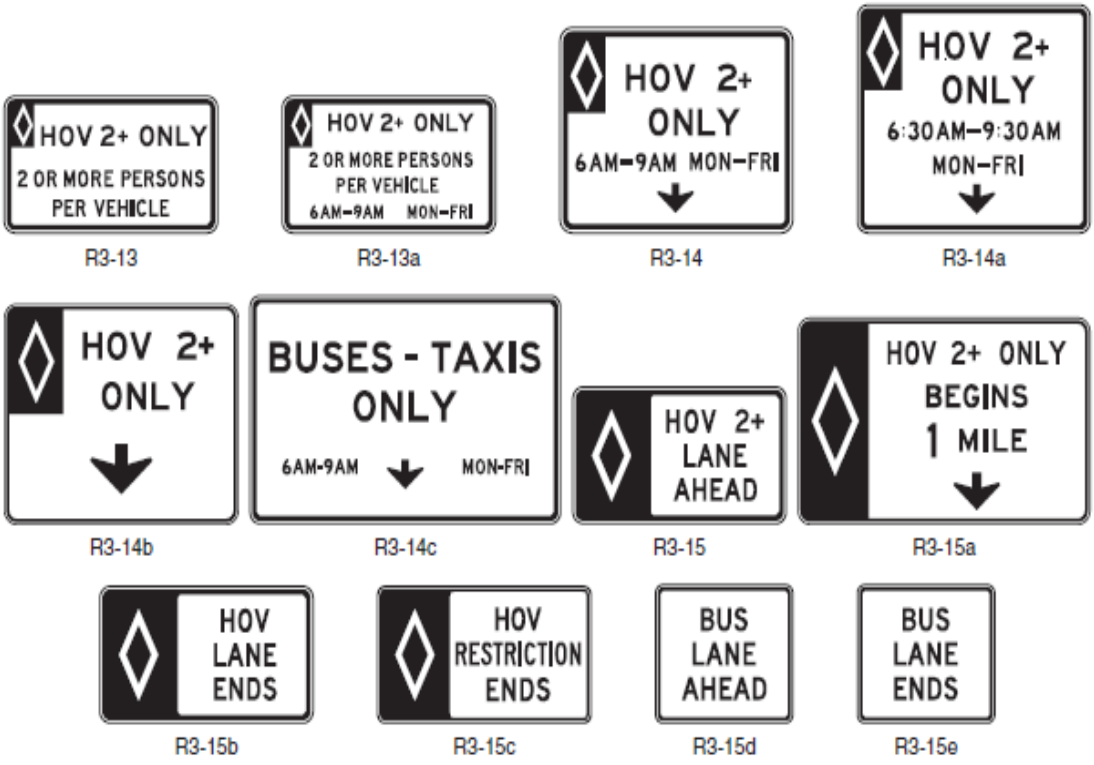
Figure 2G-1. Preferential Lane Regulatory Signs and Plaques (Sheet 1 of 2)
POST-MOUNTED PREFERENTIAL SIGNS



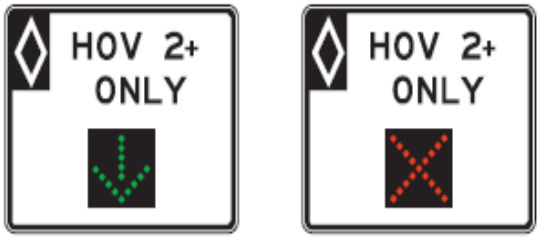
Notes:
1. The minimum vehicle occupancy requirement may vary for each facility (such as 2+, 3+, 4+).
2. The occupancy requirement may be added to the first line of the R3-12a, R3-12b, R3-12c, and R3-12d signs.
3. Some of the legends shown on these signs are for example purposes only. The specific legend for a particular application should be based upon local conditions, ordinances, and State statutes.

Figure 2G-1. Preferential Lane Regulatory Signs and Plaques (Sheet 2 of 2)

OVERHEAD PREFERENTIAL LANE SIGNS



A lane-use control signal may be incorporated into an overhead preferential lane regulatory sign to indicate the status of a reversible operation as shown in the following example:



Notes:

1. The minimum vehicle occupancy requirement may vary for each facility (such as 2+, 3+, 4+).
2. The occupancy requirement may be added to the first line of the R3-15b and R3-15c signs.
3. Some of the legends shown on these signs are for example purposes only. The specific legend for a particular application should be based upon local conditions, ordinances, and State statutes.
4. Where sufficient median width is available, the R3-13 series and R3-15 series signs may be post-mounted.

Figure 2G-1 (CA). Preferential Lane Regulatory Signs and Plaques

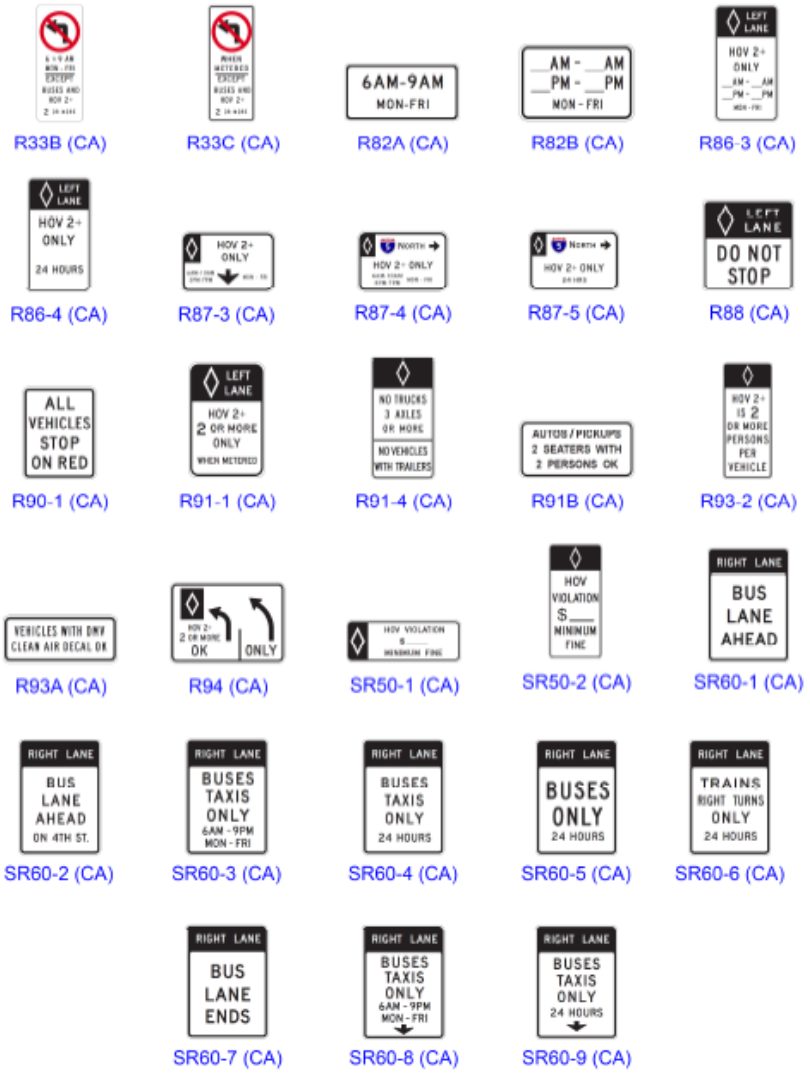


Table 2G-1. Managed and Preferential Lane Sign and Plaque Minimum Sizes

Sign or Plaque	Sign Designation	Section	Conventional Road		Expressway	Freeway	Oversized
			Single Lane	Multi-Lane			
Preferential Lane Periods of Operation (post-mounted)	R3-11 series	2G.05	30 x 42	30 x 42	36 x 60	36 x 60	78 x 96
Preferential lane Ahead of Ends (post-mounted)	R3-12 series	2G.06	30 x 42	30 x 42	36 x 60	36 x 60	48 x 84
Preferential Lane Vehicle Occupancy Definition (overhead)	R3-13, 13a	2G.04	66 x 36	66 x 36	88 x 48	144 x 78	144 x 78
HOV Lane Periods of Operation	R3-14, 14a, 14b	2G.05	72 x 60	72 x 60	96 x 72	144 x 108	144 x 108
Preferential Lane Periods of Operation (overhead	R3-14c	2G.05	90 x 60	90 x 60	108 x 72	156 x 102	168 x 102
HOV Lane Ahead (overhead)	R3-15	2G.06	66 x 36	66 x 36	84 x 48	102 x 60	102 x 60
HOV Lane Begins XX Miles (overhead)	R3-15a	2G.06	78 x 42	78 x 42	102 x 54	132 x 72	132 x 72
HOV Lane Ends (overhead)	R3-15b, 15c	2G.07	66 x 36	66 x 36	84 x 48	102 x 60	102 x 60
Preferential Lane Ahead or Ends (overhead)	R3-15d, 15e	2G.07	42 x 36	42 x 36	54 x 48	72 x 60	72 x 60
Priced Managed Lane Vehicle Occupancy Definition (post-mounted)	R3-40	2G.17	----	----	54 x 66	54 x 66	66 x 78
Priced Managed Lane Ends (post-mounted)	R3-42, 42b	2G.17	----	----	48 x 60	48 x 60	60 x 78
Priced Managed Lane Ends Advanced (post-mounted)	R3-42a, 42c	2G.17	----	----	48 x 66	48 x 66	60 x 84
Priced Managed Vehicle Occupancy Definition	R3-43	2G.17	----	----	138 x 66	138 x 66	----
Priced Managed Lane Periods of Operation (overhead)	R3-44	2G.17	----	----	90 x 84	90 x 84	----
Priced Managed Lane Periods of Operation (overhead)	R3-44a	2G.17	----	----	132 x 84	132 x 84	----
Priced Managed Lane Ends (overhead)	R3-45	2G.17	----	----	90 x 66	90 x 66	----
Priced Managed Lane Ends (overhead)	R3-45a	2G.17	----	----	114 x 66	114 x 66	----
Priced Managed Lane Toll Rate	R3-48	2G.17	----	----	Varies	Varies	----
Priced Managed Lane Toll Rate	R3-48a	2G.17	----	----	Varies	Varies	----
HOV (plaque)	W16-11P	2G.09	24 x 12	24 x 12	30 x 18	30 x 18	30 x 18
Preferential Lane Entrance Gore	E8-1	2G.10	----		48 x 96	48 x 96	----
Preferential Lane Intermediate Entrance Gore	E8-1a	2G.10	----	----	48 x 84	48 x 84	----
Preferential Lane Entrance Direction (overhead)	E8-2	2G.11	----	----	222 x 72	222 x 72	----
Preferential Lane Entrance Direction (post-mounted)	E8-2a	2G.11	----	----	186 x 108	186 x 108	----
Preferential Lane Entrance Advance	E8-3	2G.11	----	----	186 x 96	186 x 96	----
Preferential Lane Direct Exit Gore	E8-4	2G.15	----	----	60 x 78	60 x 78	----
Preferential Lane Intermediate Egress Direction	E8-5	2G.13	----	----	Varies x 90	Varies x 90	----
Preferential Lane Intermediate Egress Advance	E8-6	2G.13	----	----	Varies x 84	Varies x 84	----

Use of Changeable Message Signs

When changeable message signs are used as regulatory signs for preferential lanes, they shall be the required sign size, and display the required letter height and legend format that correspond to the type of roadway facility and design speed. When Preferential Lane regulatory signs are used on conventional roads, the decision regarding whether to use a post-mounted or overhead version of a particular type of sign should be based on an engineering study that considers the available space, existing signs for the adjacent general-purpose traffic lanes, roadway and traffic characteristics, proximity to existing overhead signs, ability to install overhead signs, and any

other unique local factors. If overhead regulatory signs, applicable only to a preferential lane, are located in approximately the same longitudinal position along the highway as overhead signs applicable only to the general-purpose lanes, the signs for the preferential lane should be separated laterally from the signs for the general-purpose lanes to the maximum extent practical to minimize conflicting information, while maintaining their visual relationship to the lanes below necessitated by specific legend or arrows indicating lane assignment.

Use of the "Diamond" Symbol

Signs illustrated in Figure 2G-1 and Figure 2G-1(CA) that incorporate the diamond symbol, shall be reserved exclusively for preferential lanes whose operational strategy is occupancy-based only and shall not be used to designate a managed lane in which other operational strategies, such as tolling and pricing, are employed to allow general-purpose traffic to use the lane. Signs illustrated in Figure 2G-1 that do not have a diamond symbol, shall be used with preferential lanes that are not HOV lanes, but are designated for use by other types of vehicles, such as buses and/or taxis. Agencies may select from either the HOV abbreviation, or the diamond symbol, (or use both), to reference the HOV lane designation.

When the diamond symbol (or HOV abbreviation) is used without text on the post-mounted Preferential Lane (R3-11 series, R3-12 series, R93-2(CA), and SR50-2(CA)) regulatory signs, it shall be centered on the top line of the sign. When the diamond symbol (or HOV abbreviation) is used with associated text on the post-mounted Preferential Lane (, R3-11 series, R3-12 series, R82-1(CA), R84-2(CA), R86(CA) series, R88(CA), and R91(CA) series) regulatory signs, it shall appear to the left of the associated text. When the diamond symbol is used on the overhead Preferential Lane (R3-13, R3-13a, R3-14, and R3-14a) regulatory signs, it shall appear in the top left quadrant. The diamond symbol for the R3-15, R3-15a, R3-15b, R3-15c, and SR50-1(CA) signs shall appear on the left side of the sign. The diamond symbol shall not be used on the bus, taxi, or bicycle Preferential Lane signs. Vehicle Occupancy Definition, Periods of Operation, and Preferential Lane Advance regulatory signs for HOV lanes shall display the minimum allowable vehicle occupancy requirement established for each HOV lane, displayed immediately after the word message HOV or the diamond symbol.

The agencies that own and operate HOV lanes have the authority and responsibility to determine how they are operated, and the minimum occupancy requirements. Information about federal requirements for certain types of vehicles not meeting the minimum occupancy requirement to be eligible to use HOV lanes (that receive Federal-aid program funding), and about requirements associated with proposed significant changes to the operation of an existing HOV lane and certain vehicles, are contained in the "Federal-Aid Highway Program Guidance on High Occupancy Vehicle (HOV) Lanes".

The provisions provided regarding regulatory signs for Preferential Lanes shall apply to managed lanes operated at all times, or at certain times, by varying vehicle occupancy requirements (HOV) or by using vehicle type restrictions as a congestion management strategy. Such managed lanes shall use changeable message signs or changeable message elements within static signs to display the appropriate regulatory sign messages only when they are in effect. When certain types of vehicles, (such as trucks) are prohibited from using a managed lane or when a managed lane is restricted to use by only certain types of vehicles during certain operational strategies, regulatory signs or regulatory panels within the appropriate guide signs that include changeable message elements shall be used to display the open/closed status of the managed lane for such vehicle types. When the vehicle occupancy required for use of an HOV lane is varied as a part of a managed lane operational strategy, regulatory signs that include changeable message elements shall be used to display the required vehicle occupancy in effect. Figures 2G-2 and 2G-3 illustrate the use of regulatory signs for the beginning, along the length, and at the end of contiguous or buffer-separated preferential lanes that provide continuous access with the adjacent general-purpose lanes. For State Highways, see Department of Transportation's High Occupancy Vehicle (HOV) Guidelines. Refer to CVC 21655.5 for Exclusive- or Preferential-Use Lanes for High Occupancy Vehicles. Refer to Figure 2G-1(CA) for Preferential Lane Regulatory Signs and Plaques.

The, R3-13, R3-13a, and R93-2(CA) Vehicle Occupancy Definition signs (see Figure 2G-1 and Figure 2G-1(CA)) shall be used where agencies determine that it is appropriate to provide a sign that defines the minimum occupancy of vehicles allowed to use an HOV lane. Vehicles with the DMV CLEAN AIR DECALOK R93A(CA) sign should be used when it is permissible for properly labeled, certified low or zero emission vehicles, regardless of the number of occupants, to use an HOV lane. Refer to CVC 21655.9. The R93A(CA) should be used in advance of, and at intervals, along the HOV lane based on engineering judgment.

When used, the R93A(CA) sign shall be placed below the R93-2(CA) sign. The AUTOS/PICKUPS 2 SEATERS WITH 2 PERSONS OK (R91B(CA)) sign may be placed below the R93-2(CA) sign for preferential lane facilities at toll plazas that require 3 or more persons per vehicle, but can also be utilized by manufacturer-designed vehicles to be occupied by no more than 2 persons. Refer to Streets & Highways Code, Section 30101.8

The legend format of the R3-13 signs should have the following sequence:

A. Top Line: "HOV 2+ ONLY" (or 3+ or 4+ if appropriate)
B. Bottom Lines: "2 OR MORE PERSONS PER VEHICLE" (or 3 or 4 if appropriate)

The legend format of the R3-13a sign should have the following sequence:

A. Top Line: "HOV 2+ ONLY" (or 3+ or 4+ if appropriate)
B. Middle Lines: "2 OR MORE PERSONS PER VEHICLE" (or 3 or 4 if appropriate)
C. Bottom Lines: Times and days the occupancy restriction is in effect

The legend format of the R93-2(CA) sign should have the following sequence:

A. Top Line: "HOV 2+ IS" (or 3+ or 4+ if appropriate)
B. Bottom Lines: "2 OR MORE PERSONS PER VEHICLE" (or 3 or 4 if appropriate)

For barrier-separated, buffer-separated or contiguous preferential lanes, where access between the preferential and general-purpose lanes is restricted to designated locations, an overhead Vehicle Occupancy Definition (R3-13 or R3-13a) sign shall be installed at least 1/2 mile in advance of the beginning of or initial entry point to an HOV lane. The R3-13 or R3-13a sign should be installed at least ¼ mile in advance of any IAPs or gaps in the barrier where vehicles are allowed to legally access the access-restricted preferential lanes. For barrier-separated HOV lanes, the sequence of a post-mounted Periods of Operation (R3-11a or R86(CA) series) sign followed by a post-mounted Vehicle Occupancy Definition (R93-2(CA)) sign, may be located at intervals of approximately 1/2 mile along the length of the HOV lane, at IAPs, and downstream of direct access ramps.

Vehicle Occupancy Signs

For buffer-separated or contiguous HOV lanes, where access is restricted to designated locations, the sequence of a post-mounted Periods of Operation (R3-11a or R86(CA) series) sign, followed by a post-mounted Vehicle Occupancy Definition (R93-2(CA)) sign shall be located at intervals not greater than 1/2 mile along the length of the access-restricted HOV lane, at designated gaps where vehicles are allowed to legally access the HOV lane, and downstream of direct access ramps. For or contiguous HOV lanes where continuous access with the adjacent general-purpose lanes is provided, the sequence of a post-mounted Periods of Operation (R3-11a or R86(CA) series) sign, followed by a post-mounted Vehicle Occupancy Definition (R93-2(CA)) sign, shall be located at intervals not greater than 1/2 mile along the length of the HOV lane. The signs within each Preferential Lane regulatory sign sequence should be separated by a minimum distance of 800 feet, and a maximum distance of 1,000 feet.

For all types of direct access ramps that provide access to or lead to HOV lanes, a post-mounted Vehicle Occupancy Definition (R93-2(CA)) sign, and an ILEV (R3-10a) sign if appropriate, shall be used at the beginning or initial entry point for the direct access ramp. The (HOV) NO TRUCKS 3 AXLES OR MORE – NO VEHICLES WITH TRAILERS (R91-4(CA)) sign may be placed adjacent to the HOV lane, as needed, where incidences of trucks or vehicles with trailers in the HOV lanes have commonly occurred and on surface streets approaching direct access ramps that provide access to or lead to HOV Lanes.

Period of Operation Signs

The sizes of post-mounted Periods of Operation R3-11, R86(CA), SR60-3(CA) through SR60-7(CA) series signs, should remain consistent to accommodate any manual addition or removal of a single line of text for each sign. Consistent sign sizes are beneficial for agencies when ordering sign materials, as well as when making text changes to existing signs if changes occur to operating times or occupancy restrictions in the future.

When used, the post-mounted Periods of Operation R3-11, R86(CA), SR60-3(CA) through SR60-7(CA) series signs, shall be located adjacent to the preferential lane. The overhead Periods of Operation (R3-14 series) signs shall be mounted directly over the lane.

The legend format of the post-mounted Periods of Operation R3-11, R3-14c, R87-3(CA), SR60-8(CA), and SR60-9(CA) signs, shall have the following sequence:

A. Top Lines: Lanes applicable, such as “RIGHT LANE” or “2 RIGHT LANES” or “THIS LANE”.
B. Middle Lines: Eligible uses, such as “HOV 2+ ONLY” (or 3+ or 4+ if appropriate) or “BUSES ONLY” or other applicable uses or eligible turning movements.
C. Bottom Lines: Applicable times and days, such as “7 AM-9 AM” or “6:30 AM – 9:30 AM, MON-FRI” or “24 HOURS”.

The legend format of the overhead Periods of Operation R3-14 and R87-3(CA) series signs, shall have the following sequence:

A. Top Line: Eligible uses, such as “HOV 2+ ONLY” (or 3+ or 4+ if appropriate) or “BUSES ONLY” or other applicable uses or eligible turning movements.
B. Bottom Lines: Applicable times and days, with the time and day placed above the down arrow, such as “7 AM – 9 AM” or “6:30 AM – 9:30 AM, MON-FRI” (When the operating periods exceed the available line width, the hours and days of the week shall be stacked as shown for the R3-14a sign in Figure 2G-1.

Regarding the Preferential Lanes that are in effect on a full-time basis, the full-time Periods of Operation R3-14b, R86-4(CA), SR60-4(CA) through SR60-6(CA) signs shall be used. The R3-11a, R3-14, R3-14a, R3-14c, R86-3(CA), R87-3(CA) and SR60-3(CA) signs, shall be used for Preferential Lanes that are in effect on a part-time basis. The full-time Periods of Operation R3-14c, R86-4(CA) and SR60-4(CA) through SR60-6(CA)) signs, shall not be used where the Preferential Lane is in effect only on a part-time basis. Where additional movements are permitted from a preferential lane on an approach to an intersection, the format and words used in the legend in the middle lines on the post-mounted Periods of Operation (R3-11 series) signs and on the top line of the overhead Periods of Operation (R3-14 series and R87-3(CA)) signs, may be modified to accommodate the permitted movements (such as “HOV 2+ AND RIGHT TURNS ONLY”). The Mandatory/Optional HOV Movement Lane Control R94(CA) sign, may be installed on local streets when one of the mandatory turn lanes (left or right) is designated as a HOV only lane.

For all barrier separated, buffer-separated or contiguous preferential lanes where access is restricted to designated locations, an overhead Periods of Operation (R3-14 series, R87-3(CA), SR60-9(CA) or SR60-9(CA)) sign shall be used at the beginning or initial entry point, and at any IAPs or gaps in the barrier where vehicles are allowed to legally access the access-restricted preferential lanes. For all barrier-separated and buffer-separated preferential lanes, post-mounted Periods of Operation R3-11, R86(CA), SR60-3(CA) through SR60-7(CA) series signs, shall be used only as a supplement to the overhead signs at the beginning or initial entry point, or at any IAPs or gaps in the barrier or buffer. For or contiguous preferential lanes where continuous access with the adjacent general-purpose lanes is provided, including those where a preferential lane is added to the roadway, (see Figure 2G-2 for HOV lanes) and those where a general-purpose lane transitions into a preferential lane (see Figure 2G-3 for HOV lanes); an overhead Periods of Operation R3-14 or R87-3(CA) series sign shall be used at the beginning or initial entry point of the preferential lane. Overhead (R3-14 series, R87-3(CA), SR60-8(CA) and SR60-9(CA)) or post-mounted (R3-11 series, R86(CA) series and SR60-3(CA) through SR60-7(CA)) Periods of Operation

signs, may be installed at periodic intervals along the length of a contiguous preferential lane where continuous access with the adjacent general-purpose lanes is provided. Additional overhead (R3-14 series, R87-3(CA), SR60-8(CA) and SR60-9(CA)) or post-mounted (R3-11 series, R86(CA) series and SR60-3(CA) through SR60-7(CA)) Periods of Operation signs may be provided along the length of any type of preferential lane. On conventional roads, the overhead Periods of Operation (R3-14 series, R87-3(CA), SR60-8(CA) and SR60-9(CA)) signs may be installed at the beginning or entry points and/or at IAPs along preferential lanes in any geometric configuration.

For all types of direct access ramps that provide access to or lead to preferential lanes, an overhead Periods of Operation (R87-4(CA) or R87-5(CA)) sign shall be used at the beginning or initial entry point of the direct access ramp. Lane-use control signals may be used at access points to preferential lanes to indicate that a ramp or access roadway, leading to the preferential lane or facility or one or more specific lanes of the facility are open or closed (see Figure 2G-14).

Changeable message signs should not be located within an interchange except for toll plazas or managed lanes.

Figure 2G-6 (CA). Guide Signs for Direct Entrances to Preferential Lanes From Another Highway

G92-1 (CA)

G20-9 (CA)

The Preferential Lane Advance (R3-12, R3-12f, R3-15, R3-15d, SR60-1(CA) and SR60-2(CA)) signs, shall be used for advance notification of a contiguous preferential lane that is added to the general-purpose lanes and continuous access with the adjacent general purpose lanes is provided (see Figure 2G-2). The Preferential Lane Advance (R3-12e and R3-15a) signs, shall be used for advance notification of a general-purpose lane that becomes a preferential lane and continuous access with the adjacent general-purpose lanes is provided (see Figure 2G-3). The legends on the R3-12f and R3-15d signs may be modified to suit the type of preferential lane. On conventional roads, for general-purpose lanes that become preferential lanes, a post-mounted (R3-12e) or overhead (R3-15a) Preferential Lane Advance sign, should be installed in advance of the beginning of or initial entry point to the preferential lane at a distance determined by engineering judgment based on speed, traffic characteristics, and other site-specific considerations. The distance selected should provide adequate opportunity for ineligible vehicles to vacate the lane prior to the beginning of the restriction. On freeways and expressways, for general-purpose lanes that become preferential lanes, an overhead Preferential Lane Advance (R3-15a) sign should be installed at least 1 mile in advance of the beginning of the preferential lane restriction. Additional post-mounted or overhead Preferential Lane Advance signs may be placed farther in advance of, closer to the beginning, or initial entry points to a preferential lane.

A Specific Hours/Days (R82A(CA) or R82B(CA)) Plaque shall be used to designate the periods of operation for preferential lanes that operate on a part-time basis. The Specific Hours/Days plaque, when used, should be placed below the R3-12, R3012e, R3-12f, SR60-1(CA) and SR60-2(CA) signs.

Advance Warning Signs

A post-mounted Preferential Lane Ends (R3-12b or R3-12h) sign shall be installed at least 1/2 mile in advance of the termination of a preferential lane. Except as provided in the paragraphs below, a post-mounted Preferential Lane Ends (R3-12a or R3-12g or SR60-7(CA)) sign shall be installed at the point where a preferential lane and

restriction end and traffic must merge into the general-purpose lanes. A post-mounted Preferential Lane Ends (R3-12d) sign shall be installed at least 1/2 mile in advance of the point where a preferential lane restriction ends and the lane becomes a general-purpose lane. Except as provided in Paragraph 7, a post-mounted Preferential Lane Ends (R3-12c) sign shall be installed at the point where a preferential lane restriction ends and the lane becomes a general-purpose lane. The legends on the R3-12g and R3-15e signs may be modified to suit the type of preferential lane. An overhead Preferential Lane Ends (R3-15b or R3-15e) sign may be installed instead of or in addition to a post-mounted R3-12a or R3-12g sign at the point where a preferential lane and restriction ends and traffic must merge into the general-purpose lanes. An overhead Preferential Lane Ends (R3-15c) sign may be installed instead of or in addition to a post-mounted R3-12c sign at the point where the preferential lane restriction ends, and the lane becomes a general-purpose lane.

Guide Signs

Guide signs at the initial and IAPs to a priced managed lane in which all general-purpose passenger vehicles are allowed shall include the legend EXPRESS or EXPRESS LANES(S). For a priced managed lane that allows non-toll travel by HOV traffic without registration in a local program, the header panel shall be modified to a regulatory format to display both the pictograph of the ETC account system and the minimum occupancy requirement for non-toll travel, with a black legend on a white background (see Figure 2G-19). Figures 2G-21 through 2G-24, show examples of guide signs for various configurations of initial and intermediate entrances, to a priced managed lane.

Figure 2G-18. Examples of Guide Signs for Entrances to Priced Managed Lanes

A - ENTRANCE TO A PRICED MANAGED LANE FROM A GENERAL PURPOSE LANE

B - DIRECT ENTRANCE TO A PRICED MANAGED LANE FROM A CROSSROAD

Note: 1. The ETC pictographs shown are examples only. The pictograph for the toll facility's adopted ETC system shall be used.
2. The examples shown are for facilities on which registration in a toll account program is required for toll payments.

Figure 2G-19. Example of an Exit Destinations Sign for a Managed Lane

The signs shall be suitably modified to display header messages of white legend on a green background, that relate the guide sign legends to the managed lanes, as appropriate in accordance with the following:

A. Post-mounted or overhead-mounted Advance Guide signs for intermediate egress to the general-purpose lanes shall include the legend LOCAL EXITS in a header panel within the guide signs, destination information or the exit number(s) for the next exit(s) accessible from the general-purpose lanes, and the appropriate distance information to the location of the egress (see Figures 2G-24 and 2G-25).
B. Post-mounted or overhead-mounted Intermediate Egress Direction signs shall include the legend LOCAL EXITS in a header panel within the signs, the destination information or the exit number(s) of the next exit(s) accessible from the general-purpose lanes, and a diagonally upward-pointing directional arrow (see Figures 2G-24 and 2G-25).
C. For direct exits to another roadway, the legend EXPRESS Exit shall be used on the Advance Guide and Exit Direction Signs (see Figure 2G-26).

D. For pull-through signs, the legend EXPRESS LANE(S) shall be used, either as a header panel within the pull-through signs or as the principal legend of the sign without the header panel (see Figures 2G-25, 2G-26, and 2G-27).

Figures 2G-28 and 2G-29 show examples of guide signing for direct entrances to a priced managed lane from a crossroad or surface street.

The G92-1(CA) sign shall be used for direct entrances to a priced managed lane from a crossroad or surface street. When used for this purpose the sign shall be modified in accordance with the provisions of this section.

The HOV VIOLATION $__ MINIMUM FINE (SR50-2(CA)) sign should be placed near the beginning of all HOV facilities and may be placed at intermediate entry point or gaps in the barrier or buffer for all barrier- or buffer-separated HOV lanes. The SR50-2(CA) sign should also be used on priced managed lane facilities that charge HOV users no toll or a discounted toll. The SR50-2(CA) sign may be repeated at 2-mile intervals or as needed at locations experiencing high violation rates. The HOV VIOLATION $__ MINIMUM FINE (SR50-1(CA)) sign may be used to supplement the SR50-2(CA) sign on HOV facilities or priced managed lane facilities where violation rates are particularly high. The SR50-1(CA) is normally placed onto an existing overhead sign structure if it can adequately support the additional sign.

These signs shall be modified to delete the diamond symbol when utilized on priced managed lanes.

For State highways, see Department of Transportation's Ramp Metering Design Manual. See Section 1A.11 for information regarding this publication. Refer to CVC 21655.5 for Exclusive- or Preferential-Use Lanes for High Occupancy Vehicles. Refer to Section 2B.56 for additional regulatory signs to be used at metered on-ramps. The No Left Turn Specific Hours EXCEPT BUSES AND HOV __+(R33B(CA)) sign should be installed on local streets (with concurrence of local agency) whenever left turns are restricted to buses and high-occupancy vehicles only during peak hours. The No Left Turn WHEN METERED EXCEPT BUSES AND HOV __+ (R33C(CA)) sign should be installed on local streets (with concurrence of local agency) whenever left turns are restricted to buses and high-occupancy vehicles only during periods of ramp metering.

The LEFT (RIGHT OR CENTER) LANE DO NOT STOP (BUSES ONLY) (R88(CA)) sign shall be used for preferential lanes at metered on-ramps to indicate that the preferential lane is not required to stop.

The diamond symbol shall not be utilized on the R88(CA) if the preferential lane is not for HOV usage. The R88(CA) sign should be placed on the same side as the preferential lane, upstream of the meter. The ALL VEHICLES STOP ON RED (R90-1(CA)) sign should be placed when converting a non-metered preferential lane to a metered operation. The R90-1(CA) sign may also be used on new installations where potential for confusion exists.

The LEFT (RIGHT OR CENTER) HOV ___+ ___ OR MORE ONLY WHEN METERED (R91-1(CA)) sign shall be used for preferential lanes at metered on-ramps to clearly indicate the lane and number of persons per vehicle required to use the lane. The message "24 HOURS" shall be used instead of "WHEN METERED" if the preferential lane is in effect on a full-time basis. An alternate 1 line message, such as "BUSES OK" may also be used in place of "WHEN METERED" on line 6 of the R91-1(CA) sign. When used, the R91-1(CA) sign should be placed near a diamond symbol pavement marking.

The examples that follow illustrate the type, size and placement of signs to be implemented on managed lanes, for various lane configurations.

Figure 2G-21. Example of Signing for the Entrance to an Access-Restricted Priced Managed Lane

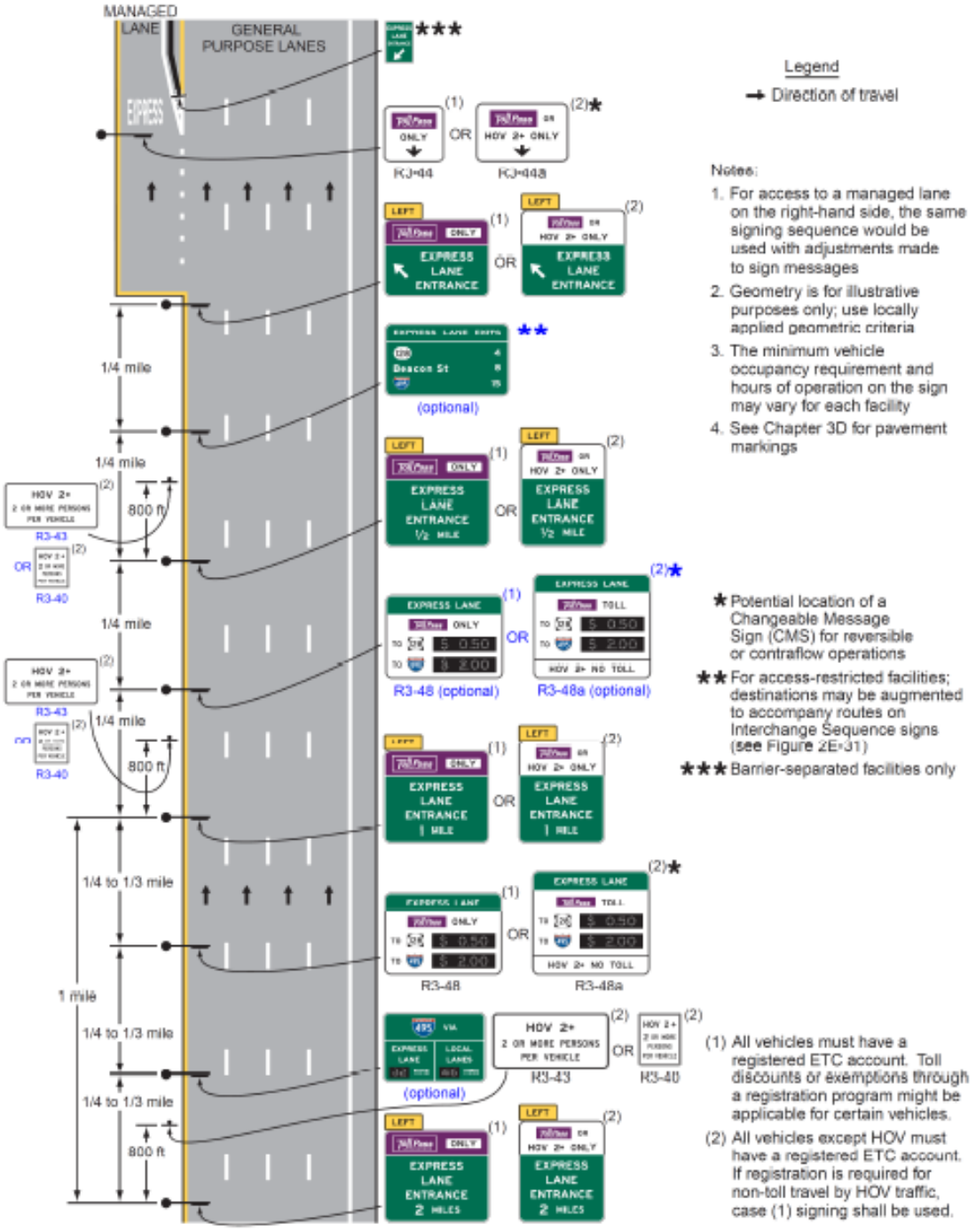


Exhibit 16

Figure 2G-23. Example of Signing for an Intermediate Entry to a Barrier- or Buffer-Separated Priced Managed Lane

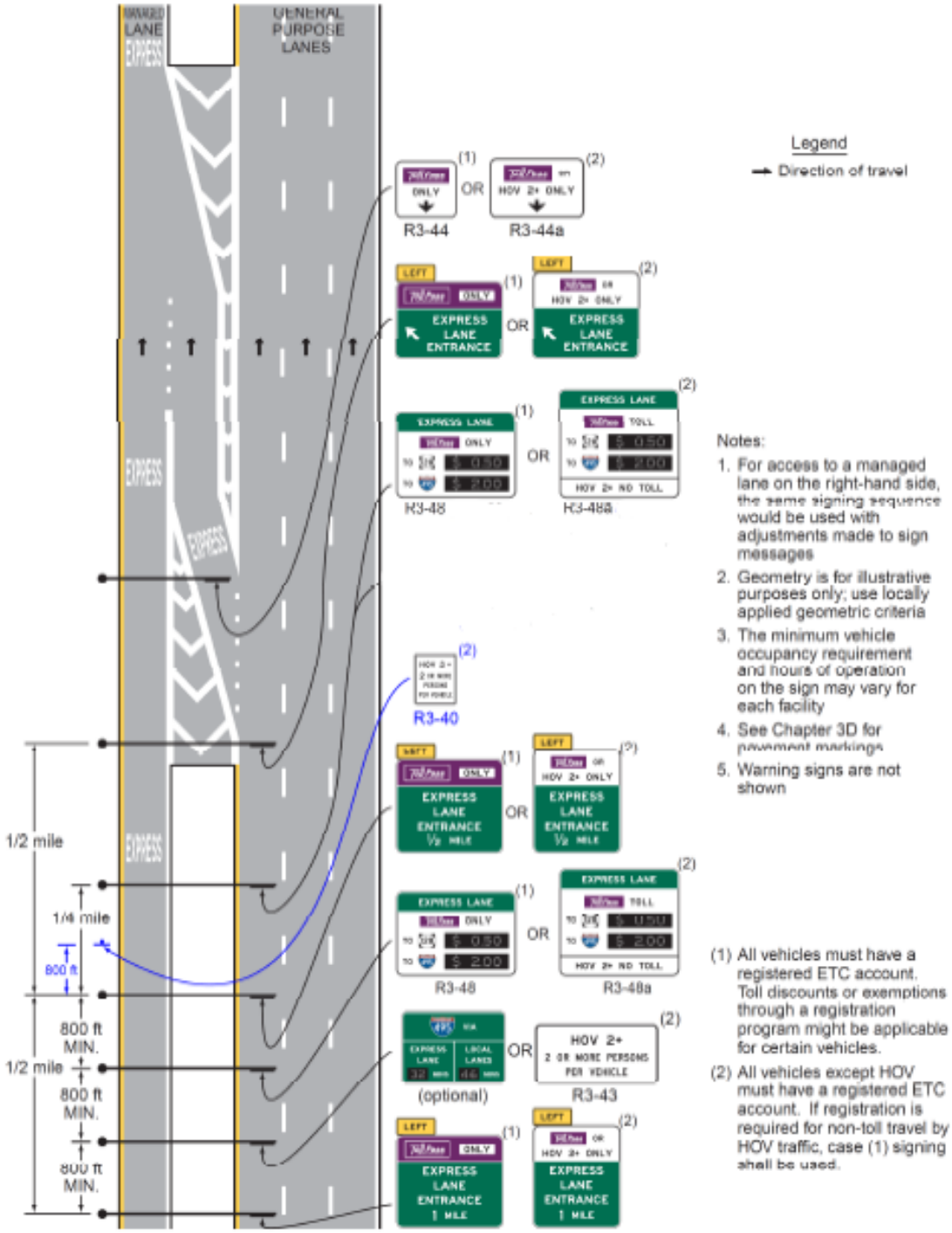


Exhibit 16

Figure 2G-24. Example of Signing for the Intermediate Entry to, Egress from, and End of Access-Restricted Priced Managed Lanes

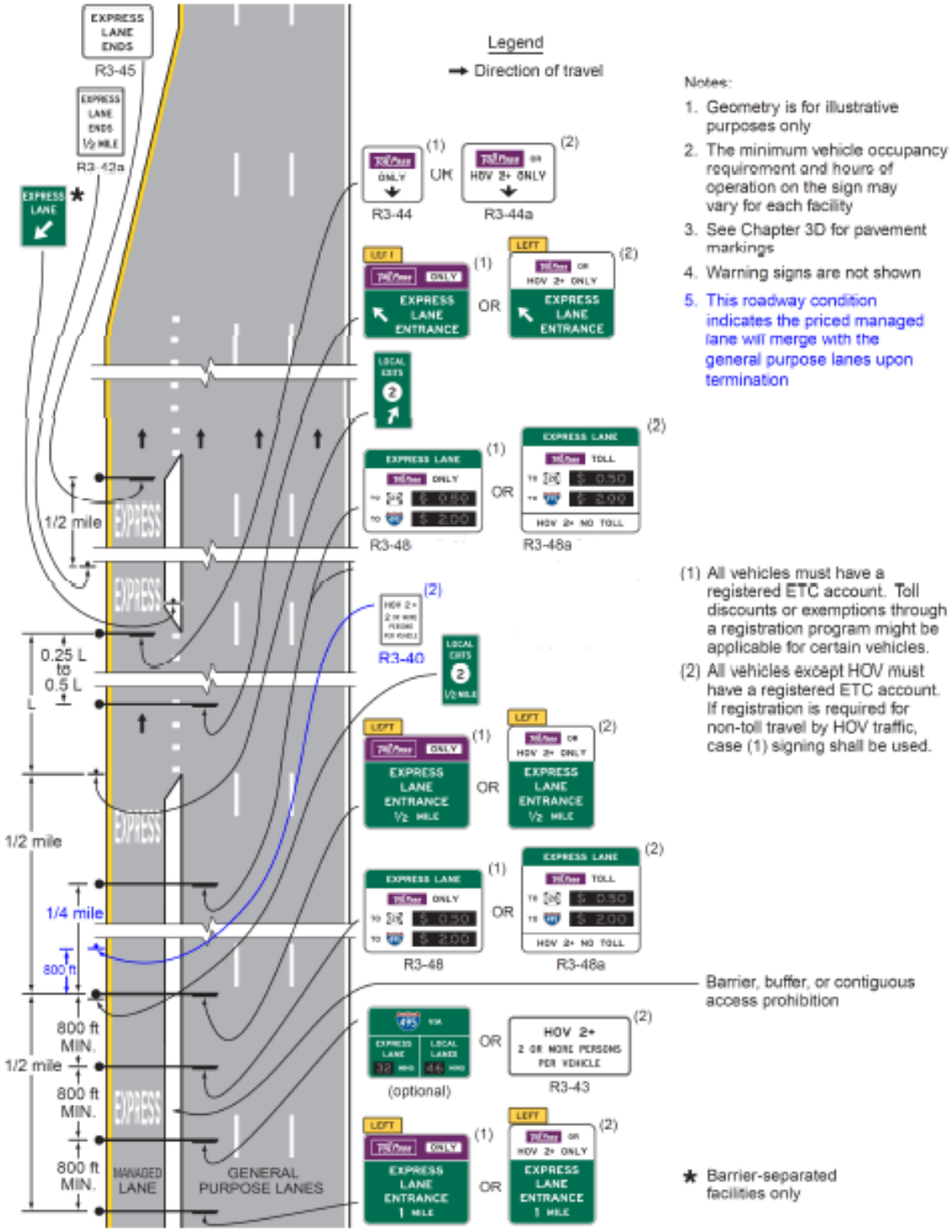


Exhibit 16

Support Cost Estimate Summary

Project: 11-2T240, 1112000131

These are NOT offical financial figures.

JEWEL, KAREN M, SD-015-30.6R/32R, HOV CONNECTORS

► view D11 Financials
► view Expenditures by Bucket
► view ETC Details by FY
► view CTIP Program By EA
► view Estimate To Complete (ETC) Details
(i.e. Resource Tabular Report)

Notes:
- Expended last updated 3/16/15.
- PRSM ETC hours last updated 3/16/15.
- Expended and ETC should be consistent with D11 Financials report.

Summary $	PA&ED	PS&E	RW	CON	Other	Total $
ETC (PRSM)	**6,963,314**		**141,022**		**87,077**	**$7,104,336**
EAC (Expended + ETC)	**$6,963,314**		**$141,022**		**$87,077**	**$7,104,336**

Total $ by FY		PA&ED	PS&E	RW	CON	Other	Total $
2015	ETC					87,077	
2017	ETC	1,187,034					**$1,187,034**
2018	ETC	1,689,184					**$1,689,184**
2019	ETC	2,066,568					**$2,066,568**
2020	ETC	1,854,656					**$1,854,656**
2021	ETC	165,872		98,322			**$264,194**
2022	ETC			42,700			**$42,700**
EAC (Expended + ETC)		**$6,963,314**		**$141,022**		**$87,077**	**$7,104,336**

EXHIBIT 17

Project Milestones for 2T240

District 11
PMSU

PRSM Milestone Data as of 3/16/15 6:22 AM

EA	PIN	Cty	Rte	Description	PM
2T240	1112000131	SD	015	1112000131 - I-15/SR78 HOV Connectors	JEWEL, KAREN M

Milestones

Code	Description	Date
M000	IDENTIFY NEED	7/01/12 A
M010	APPROVE PID	3/27/15
M015	PROGRAM PROJECT	11/18/16
M020	BEGIN ENVIRONMENTAL	11/18/16
M040	BEGIN PROJECT	11/18/16
M060	CIRC DPR & DED INTERNALLY IN DIST	9/30/19
M100	APPROVE DPR	2/05/20
M120	CIRCULATE DPR & DED EXTERNALLY	2/05/20
M140	PUBLIC HEARING	9/30/19
M160	APPROVE FED	6/26/20
M200	PA & ED	7/15/20
M800	END PROJECT	11/29/21

EXHIBIT 18

ETC Details for Project

District 11
PMSU

Project: **EA: 11-2T240** **PI (E-FIS): 1112000131**

◄ view D11 Financials

► view ETC Details by FY

Notes:
- Task details from PRSM, last updated **3/16/15 6:22 AM**.
- **Division**: Based on current year Unit to Division matrix.
- **Start** and **Finish**: Bold value indicates actual.
- **ETC $:** Estimate To Complete dollars.
- **Wt %**: % Complete weighted by EAC $ (=Sum [WBS % * (WBS EAC $ / Phase EAC $)]).
- **Exp %**: Actual Hours / EAC Hours.
- **% Complete**: From PRSM, manuallly entered by Task Manager.

Summary by SB45	Start	Finish	Wt %	Exp %	Actual Hrs	ETC Hrs	EAC Hrs	ETC $	EAC $
PID CMPT	7/01/12	3/30/15	**95%**	92%	9,481	788	10,269	$87,077	$883,138
PA & ED	7/29/13	8/03/20	**0%**	0%	0	56,507	56,507	$6,963,313	$6,963,313
PS&E	7/29/13	11/29/21	**0%**	0%	0	0	0	$0	$0
ROW	7/29/13	11/29/21	**0%**	0%	0	1,520	1,520	$141,022	$141,022
CONST	7/29/13	6/27/18	**0%**	0%	0	0	0	$0	$0
RWCAP	7/29/13	6/27/18	**0%**	0%	0	0	0	$0	$0
CONSTCAP	7/29/13	6/16/17	**0%**	0%	0	0	0	$0	$0
	7/01/12	**11/29/21**	**11%**	**14%**	**9,481**	**58,815**	**68,296**	**$7,191,413**	**$7,987,474**

All Tasks

SB45	WBS	Resource	Division	Unit	Start	Finish	% Complete	Actual Hrs	ETC Hrs	EAC Hrs	ETC $	EAC $
PA & ED	0.100.10	11.2697,I576	I-5/SR-76	2697	11/21/16	9/06/18	0%	0	8,000	8,000	$956,780	$956,780
PA & ED	0.100.10	11.2727,ENVM	ENVIRO	2727	11/21/16	9/06/18	0%	0	120	120	$10,268	$10,268
PA & ED	0.100.10	11.2730,ENVM	ENVIRO	2730	11/21/16	9/06/18	0%	0	24	24	$2,641	$2,641
PA & ED	0.100.10	11.2735,ENVM	ENVIRO	2735	11/21/16	9/06/18	0%	0	24	24	$2,259	$2,259
PA & ED	0.100.10	11.2765,I576	I-5/SR-76	2765	11/21/16	9/06/18	0%	0	1,000	1,000	$130,198	$130,198
PA & ED	0.100.10	11.2793,ESRV	ENG SVS	2793	11/21/16	9/06/18	0%	0	10	10	$1,322	$1,322
PA & ED	0.100.10	11.2810,ENVM	ENVIRO	2810	11/21/16	9/06/18	0%	0	8	8	$1,039	$1,039
PA & ED	0.100.10	11.2817,ENVM	ENVIRO	2817	11/21/16	9/06/18	0%	0	20	20	$2,565	$2,565
PA & ED	0.100.10	11.2836,RWLS	R/W	2836	11/21/16	9/06/18	0%	0	10	10	$873	$873
PA & ED	0.100.10	11.4119,RWLS	R/W	4119	11/21/16	9/06/18	0%	0	80	80	$7,586	$7,586
PA & ED	0.100.10	59.3659,GS	DES	3659	11/21/16	9/06/18	0%	0	40	40	$5,597	$5,597
PA & ED	0.100.10	59.3666,SCON	DES	3666	11/21/16	9/06/18	0%	0	32	32	$3,732	$3,732
PA & ED	0.100.10	59.3668,SCON	DES	3668	11/21/16	9/06/18	0%	0	114	114	$15,495	$15,495
PA & ED	0.160.05	11.2697,I576	I-5/SR-76	2697	11/21/16	2/28/17	0%	0	248	248	$29,660	$29,660
PA & ED	0.160.05	11.2765,I576	I-5/SR-76	2765	11/21/16	2/28/17	0%	0	3,000	3,000	$390,593	$390,593
PA & ED	0.160.05	11.2810,ENVM	ENVIRO	2810	11/21/16	2/28/17	0%	0	8	8	$1,039	$1,039
PA & ED	0.160.05	11.2817,ENVM	ENVIRO	2817	11/21/16	2/28/17	0%	0	40	40	$5,129	$5,129
PA & ED	0.160.10	11.2697,I576	I-5/SR-76	2697	3/01/17	12/12/18	0%	0	5,000	5,000	$597,988	$597,988
PA & ED	0.160.10	11.2765,I576	I-5/SR-76	2765	3/01/17	12/12/18	0%	0	500	500	$65,099	$65,099

EXHIBIT 19

ETC Details for Project

PA & ED	0.160.10	11.2775,DSGN	DESIGN	2775	3/01/17	12/12/18	0%	0	40	40	$5,561	$5,561
PA & ED	0.160.10	11.2796,DSGN	DESIGN	2796	3/01/17	12/12/18	0%	0	200	200	$27,565	$27,565
PA & ED	0.160.10	11.2803,ESRV	ENG SVS	2803	3/01/17	12/12/18	0%	0	640	640	$84,491	$84,491
PA & ED	0.160.10	11.2809,DSGN	DESIGN	2809	3/01/17	12/12/18	0%	0	24	24	$3,028	$3,028
PA & ED	0.160.10	11.2817,ENVM	ENVIRO	2817	3/01/17	12/12/18	0%	0	120	120	$15,387	$15,387
PA & ED	0.160.10	11.2827,TROP	TRAFFIC	2827	3/01/17	12/12/18	0%	0	8	8	$1,059	$1,059
PA & ED	0.160.10	11.2828,ESRV	ENG SVS	2828	3/01/17	12/12/18	0%	0	160	160	$18,776	$18,776
PA & ED	0.160.10	11.2829,TROP	TRAFFIC	2829	3/01/17	12/12/18	0%	0	208	208	$26,301	$26,301
PA & ED	0.160.10	11.2831,TROP	TRAFFIC	2831	3/01/17	12/12/18	0%	0	20	20	$2,562	$2,562
PA & ED	0.160.10	11.2839,RWLS	R/W	2839	3/01/17	12/12/18	0%	0	500	500	$43,826	$43,826
PA & ED	0.160.10	11.2927,TPLN	PLANNING	2927	3/01/17	12/12/18	0%	0	40	40	$3,628	$3,628
PA & ED	0.160.10	11.4119,RWLS	R/W	4119	3/01/17	12/12/18	0%	0	15	15	$1,422	$1,422
PA & ED	0.160.10	11.CC03	Consult232	CC03	3/01/17	12/12/18	0%	0	0	0	$0	$0
PA & ED	0.160.10	53.3420,PRJD	HQ Design	3420	3/01/17	12/12/18	0%	0	10	10	$1,570	$1,570
PA & ED	0.160.10	59.3659,GS	DES	3659	3/01/17	12/12/18	0%	0	920	920	$128,741	$128,741
PA & ED	0.160.10	59.3666,SCON	DES	3666	3/01/17	12/12/18	0%	0	4	4	$466	$466
PA & ED	0.160.10	59.3668,SCON	DES	3668	3/01/17	12/12/18	0%	0	60	60	$8,155	$8,155
PA & ED	0.160.15	11.2697,I576	I-5/SR-76	2697	12/13/18	2/05/20	0%	0	2,000	2,000	$239,195	$239,195
PA & ED	0.160.15	11.2733,ENVM	ENVIRO	2733	12/13/18	2/05/20	0%	0	80	80	$6,800	$6,800
PA & ED	0.160.15	11.2735,ENVM	ENVIRO	2735	12/13/18	2/05/20	0%	0	40	40	$3,765	$3,765
PA & ED	0.160.15	11.2765,I576	I-5/SR-76	2765	12/13/18	2/05/20	0%	0	11,264	11,264	$1,466,545	$1,466,545
PA & ED	0.160.15	11.2775,DSGN	DESIGN	2775	12/13/18	2/05/20	0%	0	40	40	$5,561	$5,561
PA & ED	0.160.15	11.2793,ESRV	ENG SVS	2793	12/13/18	2/05/20	0%	0	220	220	$29,076	$29,076
PA & ED	0.160.15	11.2794,DSGN	DESIGN	2794	12/13/18	2/05/20	0%	0	48	48	$6,500	$6,500
PA & ED	0.160.15	11.2795,DSGN	DESIGN	2795	12/13/18	2/05/20	0%	0	8	8	$693	$693
PA & ED	0.160.15	11.2810,ENVM	ENVIRO	2810	12/13/18	2/05/20	0%	0	8	8	$1,039	$1,039
PA & ED	0.160.15	11.2817,ENVM	ENVIRO	2817	12/13/18	2/05/20	0%	0	40	40	$5,129	$5,129
PA & ED	0.160.15	11.2827,TROP	TRAFFIC	2827	12/13/18	2/05/20	0%	0	8	8	$1,059	$1,059
PA & ED	0.160.15	11.2833,ESRV	ENG SVS	2833	12/13/18	2/05/20	0%	0	48	48	$6,600	$6,600
PA & ED	0.160.20	11.2765,I576	I-5/SR-76	2765	12/13/18	5/21/19	0%	0	500	500	$65,099	$65,099
PA & ED	0.160.20	11.2799,SURV	LAND SURVEYS	2799	12/13/18	5/21/19	0%	0	400	400	$50,134	$50,134
PA & ED	0.160.20	11.2800,SURV	LAND SURVEYS	2800	12/13/18	5/21/19	0%	0	500	500	$65,879	$65,879
PA & ED	0.160.20	11.2801,SURV	LAND SURVEYS	2801	12/13/18	5/21/19	0%	0	500	500	$59,394	$59,394
PA & ED	0.160.20	11.2802,SURV	LAND SURVEYS	2802	12/13/18	5/21/19	0%	0	400	400	$33,197	$33,197
PA & ED	0.160.30	11.2765,I576	I-5/SR-76	2765	3/01/17	6/30/17	0%	0	100	100	$13,020	$13,020
PA & ED	0.160.30	11.2838,RWLS	R/W	2838	3/01/17	6/30/17	0%	0	30	30	$2,673	$2,673
PA & ED	0.160.40	11.2765,I576	I-5/SR-76	2765	3/01/17	4/11/17	0%	0	50	50	$6,510	$6,510
PA & ED	0.160.45	11.2765,I576	I-5/SR-76	2765	12/13/18	3/01/19	0%	0	1,000	1,000	$130,198	$130,198
PA & ED	0.165.05	11.2727,ENVM	ENVIRO	2727	7/03/17	9/13/17	0%	0	360	360	$30,803	$30,803

EXHIBIT 19

ETC Details for Project

PA & ED	0.165.05	11.2735,ENVM	ENVIRO	2735	7/03/17	9/13/17	0%	0	16	16	$1,506	$1,506
PA & ED	0.165.05	11.2765,I576	I-5/SR-76	2765	7/03/17	9/13/17	0%	0	100	100	$13,020	$13,020
PA & ED	0.165.10	11.2697,I576	I-5/SR-76	2697	9/14/17	4/19/19	0%	0	2,000	2,000	$239,195	$239,195
PA & ED	0.165.10	11.2727,ENVM	ENVIRO	2727	9/14/17	4/19/19	0%	0	350	350	$29,947	$29,947
PA & ED	0.165.10	11.2730,ENVM	ENVIRO	2730	9/14/17	4/19/19	0%	0	24	24	$2,641	$2,641
PA & ED	0.165.10	11.2733,ENVM	ENVIRO	2733	9/14/17	4/19/19	0%	0	160	160	$13,600	$13,600
PA & ED	0.165.10	11.2736,ENVM	ENVIRO	2736	9/14/17	4/19/19	0%	0	80	80	$7,579	$7,579
PA & ED	0.165.10	11.2810,ENVM	ENVIRO	2810	9/14/17	4/19/19	0%	0	8	8	$1,039	$1,039
PA & ED	0.165.10	11.2812,ENVM	ENVIRO	2812	9/14/17	4/19/19	0%	0	320	320	$44,481	$44,481
PA & ED	0.165.10	11.2814,ENVM	ENVIRO	2814	9/14/17	4/19/19	0%	0	1,860	1,860	$283,516	$283,516
PA & ED	0.165.10	11.2817,ENVM	ENVIRO	2817	9/14/17	4/19/19	0%	0	560	560	$71,806	$71,806
PA & ED	0.165.10	11.2819,ENVM	ENVIRO	2819	9/14/17	4/19/19	0%	0	260	260	$35,888	$35,888
PA & ED	0.165.15	11.2735,ENVM	ENVIRO	2735	9/14/17	8/15/18	0%	0	260	260	$24,474	$24,474
PA & ED	0.165.20	11.2733,ENVM	ENVIRO	2733	9/14/17	5/16/18	0%	0	524	524	$44,540	$44,540
PA & ED	0.165.25	11.2727,ENVM	ENVIRO	2727	4/22/19	9/30/19	0%	0	1,270	1,270	$108,665	$108,665
PA & ED	0.165.25	11.2735,ENVM	ENVIRO	2735	4/22/19	9/30/19	0%	0	24	24	$2,259	$2,259
PA & ED	0.165.25	11.2765,I576	I-5/SR-76	2765	4/22/19	9/30/19	0%	0	150	150	$19,530	$19,530
PA & ED	0.165.25	11.2812,ENVM	ENVIRO	2812	4/22/19	9/30/19	0%	0	80	80	$11,120	$11,120
PA & ED	0.165.25	11.2819,ENVM	ENVIRO	2819	4/22/19	9/30/19	0%	0	120	120	$16,564	$16,564
PA & ED	0.170.05	11.2765,I576	I-5/SR-76	2765	11/21/16	1/06/17	0%	0	40	40	$5,208	$5,208
PA & ED	0.170.10	11.2730,ENVM	ENVIRO	2730	1/09/17	5/11/17	0%	0	100	100	$11,004	$11,004
PA & ED	0.170.10	11.2765,I576	I-5/SR-76	2765	1/09/17	5/11/17	0%	0	40	40	$5,208	$5,208
PA & ED	0.170.20	11.2765,I576	I-5/SR-76	2765	1/09/17	5/11/17	0%	0	400	400	$52,079	$52,079
PA & ED	0.170.25	11.2765,I576	I-5/SR-76	2765	1/09/17	3/14/17	0%	0	50	50	$6,510	$6,510
PA & ED	0.170.30	11.2765,I576	I-5/SR-76	2765	1/09/17	2/17/17	0%	0	100	100	$13,020	$13,020
PA & ED	0.170.40	11.2765,I576	I-5/SR-76	2765	1/09/17	2/17/17	0%	0	500	500	$65,099	$65,099
PA & ED	0.175.05	11.2727,ENVM	ENVIRO	2727	2/06/20	4/30/20	0%	0	72	72	$6,161	$6,161
PA & ED	0.175.05	11.2728,ENVM	ENVIRO	2728	2/06/20	4/30/20	0%	0	16	16	$1,478	$1,478
PA & ED	0.175.05	11.2819,ENVM	ENVIRO	2819	2/06/20	4/30/20	0%	0	12	12	$1,656	$1,656
PA & ED	0.175.10	11.2727,ENVM	ENVIRO	2727	2/06/20	2/26/20	0%	0	96	96	$8,214	$8,214
PA & ED	0.175.10	11.2728,ENVM	ENVIRO	2728	2/06/20	2/26/20	0%	0	128	128	$11,825	$11,825
PA & ED	0.175.10	11.2735,ENVM	ENVIRO	2735	2/06/20	2/26/20	0%	0	16	16	$1,506	$1,506
PA & ED	0.175.10	11.2736,ENVM	ENVIRO	2736	2/06/20	2/26/20	0%	0	10	10	$947	$947
PA & ED	0.175.10	11.2765,I576	I-5/SR-76	2765	2/06/20	2/26/20	0%	0	50	50	$6,510	$6,510
PA & ED	0.175.10	11.2812,ENVM	ENVIRO	2812	2/06/20	2/26/20	0%	0	160	160	$22,241	$22,241
PA & ED	0.175.10	11.2819,ENVM	ENVIRO	2819	2/06/20	2/26/20	0%	0	60	60	$8,282	$8,282
PA & ED	0.175.15	11.2727,ENVM	ENVIRO	2727	2/27/20	4/07/20	0%	0	400	400	$34,225	$34,225
PA & ED	0.175.15	11.2728,ENVM	ENVIRO	2728	2/27/20	4/07/20	0%	0	120	120	$11,086	$11,086
PA & ED	0.175.15	11.2765,I576	I-5/SR-76	2765	2/27/20	4/07/20	0%	0	100	100	$13,020	$13,020

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PA & ED	0.175.20	11.2765,I576	I-5/SR-76	2765	2/27/20	4/07/20	0%	0	50	50	$6,510	$6,510
PA & ED	0.180.05	11.2727,ENVM	ENVIRO	2727	2/06/20	8/03/20	0%	0	48	48	$4,107	$4,107
PA & ED	0.180.05	11.2765,I576	I-5/SR-76	2765	2/06/20	8/03/20	0%	0	5,632	5,632	$733,272	$733,272
PA & ED	0.180.05	11.2793,ESRV	ENG SVS	2793	2/06/20	8/03/20	0%	0	160	160	$21,146	$21,146
PA & ED	0.180.05	11.2795,DSGN	DESIGN	2795	2/06/20	8/03/20	0%	0	8	8	$693	$693
PA & ED	0.180.05	11.2810,ENVM	ENVIRO	2810	2/06/20	8/03/20	0%	0	88	88	$11,426	$11,426
PA & ED	0.180.05	11.2812,ENVM	ENVIRO	2812	2/06/20	8/03/20	0%	0	40	40	$5,560	$5,560
PA & ED	0.180.05	11.2819,ENVM	ENVIRO	2819	2/06/20	8/03/20	0%	0	12	12	$1,656	$1,656
PA & ED	0.180.05	11.2833,ESRV	ENG SVS	2833	2/06/20	8/03/20	0%	0	40	40	$5,500	$5,500
PA & ED	0.180.05	11.2839,RWLS	R/W	2839	2/06/20	8/03/20	0%	0	100	100	$8,765	$8,765
PA & ED	0.180.10	11.2727,ENVM	ENVIRO	2727	4/08/20	6/26/20	0%	0	300	300	$25,669	$25,669
PA & ED	0.180.10	11.2728,ENVM	ENVIRO	2728	4/08/20	6/26/20	0%	0	120	120	$11,086	$11,086
PA & ED	0.180.10	11.2735,ENVM	ENVIRO	2735	4/08/20	6/26/20	0%	0	32	32	$3,012	$3,012
PA & ED	0.180.10	11.2765,I576	I-5/SR-76	2765	4/08/20	6/26/20	0%	0	100	100	$13,020	$13,020
PA & ED	0.180.10	11.2812,ENVM	ENVIRO	2812	4/08/20	6/26/20	0%	0	40	40	$5,560	$5,560
PA & ED	0.180.15	11.2727,ENVM	ENVIRO	2727	6/29/20	7/15/20	0%	0	200	200	$17,113	$17,113
PA & ED	0.180.15	11.2736,ENVM	ENVIRO	2736	6/29/20	7/15/20	0%	0	2	2	$189	$189
PA & ED	0.180.15	11.2812,ENVM	ENVIRO	2812	6/29/20	7/15/20	0%	0	8	8	$1,112	$1,112
PA & ED	0.E	EXPENSE	Various		7/29/13	1/31/17	0%	0	0	0	$0	$0
PA & ED	0.E	LABOR	Various		7/29/13	1/31/17	0%	0	0	0	$0	$0
PS&E	1.100.15	59.3640,OE	DES	3640	7/16/20	11/29/21	0%	0	0	0		
PS&E	1.D	EXPENSE	Various		7/29/13	7/29/13	0%	0	0	0	$0	$0
PS&E	1.D	LABOR	Various		7/29/13	7/29/13	0%	0	0	0	$0	$0
ROW	2.100.25	11.2835,RWLS	R/W	2835	7/16/20	11/29/21	0%	0	20	20	$2,565	$2,565
ROW	2.100.25	11.2836,RWLS	R/W	2836	7/16/20	11/29/21	0%	0	500	500	$43,633	$43,633
ROW	2.100.25	11.4119,RWLS	R/W	4119	7/16/20	11/29/21	0%	0	1,000	1,000	$94,825	$94,825
ROW	2.R	EXPENSE	Various		7/29/13	7/29/13	0%	0	0	0	$0	$0
ROW	2.R	LABOR	Various		7/29/13	7/29/13	0%	0	0	0	$0	$0
CONST	3.C	EXPENSE	Various		7/29/13	6/27/18	0%	0	0	0	$0	$0
CONST	3.C	LABOR	Various		7/29/13	6/27/18	0%	0	0	0	$0	$0
CONSTCAP	4.CC	EXPENSE	Various		7/29/13	6/16/17	0%	0	0	0	$0	$0
CONSTCAP	4.CC	LABOR	Various		7/29/13	6/16/17	0%	0	0	0	$0	$0
RWCAP	9.RC	EXPENSE	Various		7/29/13	6/27/18	0%	0	0	0	$0	$0
RWCAP	9.RC	LABOR	Various		7/29/13	6/27/18	0%	0	0	0	$0	$0
PID CMPT	K.100.05	11.2677,ADMN	ADMIN	2677	**10/19/14**	3/27/15	90%	0	0	0	$0	$0
PID CMPT	K.100.05	11.2697,I576	I-5/SR-76	2697	**10/19/14**	3/27/15	90%	223	55	278	$6,323	$27,015
PID CMPT	K.100.05	11.2714,PPM	PPM	2714	**10/19/14**	3/27/15	90%	4	0	4	$0	$316
PID CMPT	K.100.05	11.2715,PPM	PPM	2715	**10/19/14**	3/27/15	90%	0	0	0	$0	$0
PID CMPT	K.100.05	11.2740,TPLN	PLANNING	2740	**10/19/14**	3/27/15	90%	0	8	8	$789	$789

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PID CMPT	K.100.05	11.2765,I576	I-5/SR-76	2765	**10/19/14**	3/27/15	90%	216	0	216	$0	$21,324
PID CMPT	K.100.05	11.2836,RWLS	R/W	2836	**10/19/14**	3/27/15	90%	9	8	17	$671	$1,171
PID CMPT	K.100.05	11.2839,RWLS	R/W	2839	**10/19/14**	3/27/15	90%	0	10	10	$843	$843
PID CMPT	K.100.05	11.2848,CONS	CONSTRUCT	2848	**10/19/14**	3/27/15	90%	0	0	0	$0	$0
PID CMPT	K.100.05	11.4119,RWLS	R/W	4119	**10/19/14**	3/27/15	90%	6	14	20	$1,276	$1,649
PID CMPT	K.150.05	11.2727,ENVM	ENVIRO	2727	**10/29/12**	**9/30/14**	100%	6	0	6	$0	$396
PID CMPT	K.150.05	11.2735,ENVM	ENVIRO	2735	**10/29/12**	**9/30/14**	100%	0	0	0	$0	$0
PID CMPT	K.150.05	11.2747,TPLN	PLANNING	2747	**10/29/12**	**9/30/14**	100%	108	0	108	$0	$9,129
PID CMPT	K.150.05	11.2759,PPM	PPM	2759	**10/29/12**	**9/30/14**	100%	0	0	0	$0	$0
PID CMPT	K.150.05	11.2796,DSGN	DESIGN	2796	**10/29/12**	**9/30/14**	100%	2	0	2	$0	$169
PID CMPT	K.150.05	11.2839,RWLS	R/W	2839	**10/29/12**	**9/30/14**	100%	0	0	0	$0	$0
PID CMPT	K.150.10	11.2759,PPM	PPM	2759	**4/29/13**	**9/30/14**	100%	24	0	24	$0	$1,949
PID CMPT	K.150.10	53.3416,PRJD	HQ Design	3416	**4/29/13**	**9/30/14**	100%	0	0	0	$0	$0
PID CMPT	K.150.15	11.2684,ADMN	ADMIN	2684	**9/30/12**	2/23/15	95%	4	0	4	$0	$152
PID CMPT	K.150.15	11.2727,ENVM	ENVIRO	2727	**9/30/12**	2/23/15	95%	211	0	211	$0	$13,017
PID CMPT	K.150.15	11.2728,ENVM	ENVIRO	2728	**9/30/12**	2/23/15	95%	0	5	5	$444	$444
PID CMPT	K.150.15	11.2729,ENVM	ENVIRO	2729	**9/30/12**	2/23/15	95%	0	5	5	$449	$449
PID CMPT	K.150.15	11.2733,ENVM	ENVIRO	2733	**9/30/12**	2/23/15	95%	0	5	5	$409	$409
PID CMPT	K.150.15	11.2747,TPLN	PLANNING	2747	**9/30/12**	2/23/15	95%	5	8	13	$943	$1,394
PID CMPT	K.150.15	11.2759,PPM	PPM	2759	**9/30/12**	2/23/15	95%	456	10	466	$1,170	$34,818
PID CMPT	K.150.15	11.2765,I576	I-5/SR-76	2765	**9/30/12**	2/23/15	95%	2,267	2	2,269	$250	$193,582
PID CMPT	K.150.15	11.2773,MTCE	MAINT	2773	**9/30/12**	2/23/15	95%	4	4	8	$509	$867
PID CMPT	K.150.15	11.2775,DSGN	DESIGN	2775	**9/30/12**	2/23/15	95%	6	0	6	$0	$528
PID CMPT	K.150.15	11.2793,ESRV	ENG SVS	2793	**9/30/12**	2/23/15	95%	96	20	116	$2,541	$10,340
PID CMPT	K.150.15	11.2794,DSGN	DESIGN	2794	**9/30/12**	2/23/15	95%	90	0	90	$0	$8,157
PID CMPT	K.150.15	11.2796,DSGN	DESIGN	2796	**9/30/12**	2/23/15	95%	0	5	5	$662	$247
PID CMPT	K.150.15	11.2798,SURV	LAND SURVEYS	2798	**9/30/12**	2/23/15	95%	0	8	8	$754	$754
PID CMPT	K.150.15	11.2799,SURV	LAND SURVEYS	2799	**9/30/12**	2/23/15	95%	1	7	8	$843	$922
PID CMPT	K.150.15	11.2802,SURV	LAND SURVEYS	2802	**9/30/12**	2/23/15	95%	0	8	8	$638	$638
PID CMPT	K.150.15	11.2803,ESRV	ENG SVS	2803	**9/30/12**	2/23/15	95%	5	3	8	$381	$907
PID CMPT	K.150.15	11.2805,ESRV	ENG SVS	2805	**9/30/12**	2/23/15	95%	0	8	8	$890	$890
PID CMPT	K.150.15	11.2807,ESRV	ENG SVS	2807	**9/30/12**	2/23/15	95%	0	4	4	$416	$416
PID CMPT	K.150.15	11.2810,ENVM	ENVIRO	2810	**9/30/12**	2/23/15	95%	29	0	29	$0	$2,572
PID CMPT	K.150.15	11.2814,ENVM	ENVIRO	2814	**9/30/12**	2/23/15	95%	5	3	8	$440	$966
PID CMPT	K.150.15	11.2816,DSGN	DESIGN	2816	**9/30/12**	2/23/15	95%	3	7	10	$809	$1,077
PID CMPT	K.150.15	11.2817,ENVM	ENVIRO	2817	**9/30/12**	2/23/15	95%	12	10	22	$1,233	$2,248
PID CMPT	K.150.15	11.2824,TROP	TRAFFIC	2824	**9/30/12**	2/23/15	95%	147	0	147	$0	$11,547
PID CMPT	K.150.15	11.2827,TROP	TRAFFIC	2827	**9/30/12**	2/23/15	95%	0	8	8	$1,018	$1,018
PID CMPT	K.150.15	11.2828,ESRV	ENG SVS	2828	**9/30/12**	2/23/15	95%	40	40	80	$4,512	$8,006

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PID CMPT	K.150.15	11.2829,TROP	TRAFFIC	2829	**9/30/12**	2/23/15	95%	21	10	31	$1,215	$2,960
PID CMPT	K.150.15	11.2831,TROP	TRAFFIC	2831	**9/30/12**	2/23/15	95%	12	0	12	$0	$1,049
PID CMPT	K.150.15	11.2833,ESRV	ENG SVS	2833	**9/30/12**	2/23/15	95%	45	0	45	$0	$4,354
PID CMPT	K.150.15	11.2836,RWLS	R/W	2836	**9/30/12**	2/23/15	95%	6	0	6	$0	$335
PID CMPT	K.150.15	11.2839,RWLS	R/W	2839	**9/30/12**	2/23/15	95%	2	180	182	$15,166	$15,296
PID CMPT	K.150.15	11.2848,CONS	CONSTRUCT	2848	**9/30/12**	2/23/15	95%	12	0	12	$0	$1,073
PID CMPT	K.150.15	11.4119,RWLS	R/W	4119	**9/30/12**	2/23/15	95%	290	15	305	$1,367	$18,364
PID CMPT	K.150.15	59.3587,SDSN	DES	3587	**9/30/12**	2/23/15	95%	165	0	165	$0	$16,215
PID CMPT	K.150.15	59.3659,GS	DES	3659	**9/30/12**	2/23/15	95%	17	0	17	$0	$1,732
PID CMPT	K.150.15	59.3668,SCON	DES	3668	**9/30/12**	2/23/15	95%	6	0	6	$0	$568
PID CMPT	K.150.20	11.2677,ADMN	ADMIN	2677	**7/28/13**	3/30/15	95%	0	0	0	$0	$0
PID CMPT	K.150.20	11.2714,PPM	PPM	2714	**7/28/13**	3/30/15	95%	0	8	8	$998	$998
PID CMPT	K.150.20	11.2727,ENVM	ENVIRO	2727	**7/28/13**	3/30/15	95%	270	0	270	$0	$15,986
PID CMPT	K.150.20	11.2730,ENVM	ENVIRO	2730	**7/28/13**	3/30/15	95%	38	6	44	$635	$2,530
PID CMPT	K.150.20	11.2735,ENVM	ENVIRO	2735	**7/28/13**	3/30/15	95%	7	0	7	$0	$411
PID CMPT	K.150.20	11.2747,TPLN	PLANNING	2747	**7/28/13**	3/30/15	95%	0	0	0	$0	$0
PID CMPT	K.150.20	11.2759,PPM	PPM	2759	**7/28/13**	3/30/15	95%	0	0	0	$0	$0
PID CMPT	K.150.20	11.2810,ENVM	ENVIRO	2810	**7/28/13**	3/30/15	95%	99	0	99	$0	$8,762
PID CMPT	K.150.20	11.2811,ENVM	ENVIRO	2811	**7/28/13**	3/30/15	95%	27	0	27	$0	$2,368
PID CMPT	K.150.20	11.2812,ENVM	ENVIRO	2812	**7/28/13**	3/30/15	95%	8	0	8	$0	$633
PID CMPT	K.150.20	11.2814,ENVM	ENVIRO	2814	**7/28/13**	3/30/15	95%	3	0	3	$0	$235
PID CMPT	K.150.20	11.2817,ENVM	ENVIRO	2817	**7/28/13**	3/30/15	95%	4	0	4	$0	$350
PID CMPT	K.150.20	11.2819,ENVM	ENVIRO	2819	**7/28/13**	3/30/15	95%	8	0	8	$0	$702
PID CMPT	K.150.20	11.2833,ESRV	ENG SVS	2833	**7/28/13**	3/30/15	95%	0	8	8	$1,057	$1,057
PID CMPT	K.150.25	11.2759,PPM	PPM	2759	**1/11/15**	3/27/15	70%	61	0	61	$0	$5,349
PID CMPT	K.150.25	11.2765,I576	I-5/SR-76	2765	**1/11/15**	3/27/15	70%	102	0	102	$0	$9,211
PID CMPT	K.150.25	11.2766,MTCE	MAINT	2766	**1/11/15**	3/27/15	70%	0	0	0	$0	$0
PID CMPT	K.150.25	11.2775,DSGN	DESIGN	2775	**1/11/15**	3/27/15	70%	2	38	40	$5,078	$5,248
PID CMPT	K.150.25	11.2793,ESRV	ENG SVS	2793	**1/11/15**	3/27/15	70%	3	158	160	$20,009	$20,198
PID CMPT	K.150.25	11.2794,DSGN	DESIGN	2794	**1/11/15**	3/27/15	70%	0	48	48	$6,248	$6,248
PID CMPT	K.150.25	11.2795,DSGN	DESIGN	2795	**1/11/15**	3/27/15	70%	0	8	8	$666	$666
PID CMPT	K.150.25	11.2809,DSGN	DESIGN	2809	**1/11/15**	3/27/15	70%	0	0	0	$0	$0
PID CMPT	K.150.25	11.2836,RWLS	R/W	2836	**1/11/15**	3/27/15	70%	0	0	0	$0	$0
PID CMPT	K.150.25	11.2865,MTCE	MAINT	2865	**1/11/15**	3/27/15	70%	0	0	0	$0	$0
PID CMPT	K.150.25	53.3420,PRJD	HQ Design	3420	**1/11/15**	3/27/15	70%	0	0	0	$0	$0
PID CMPT	K.150.25	59.3666,SCON	DES	3666	**1/11/15**	3/27/15	70%	0	4	4	$448	$448
PID CMPT	K.150.25	59.3668,SCON	DES	3668	**1/11/15**	3/27/15	70%	0	32	32	$4,181	$4,181
PID CMPT	K.150.35	11.2730,ENVM	ENVIRO	2730	**3/03/14**	**10/26/14**	100%	2	0	2	$0	$102
PID CMPT	K.150.35	11.2731,ENVM	ENVIRO	2731	**3/03/14**	**10/26/14**	100%	0	0	0	$0	$0

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PID CMPT	K.150.35	11.2735,ENVM	ENVIRO	2735	**3/03/14**	**10/26/14**	100%	0	0	0	$0	$0
PID CMPT	K.150.35	11.2759,PPM	PPM	2759	**3/03/14**	**10/26/14**	100%	9	0	9	$0	$683
PID CMPT	K.150.40	11.2731,ENVM	ENVIRO	2731	**12/18/13**	2/25/15	95%	0	4	4	$429	$429
PID CMPT	K.150.40	11.2735,ENVM	ENVIRO	2735	**12/18/13**	2/25/15	95%	0	4	4	$362	$362
PID CMPT	K.150.40	11.2759,PPM	PPM	2759	**12/18/13**	2/25/15	95%	0	0	0	$0	$0
PID CMPT	K.P	11.2714,PPM	PPM	2714	**7/01/12**	9/06/13	99%	19	0	19	$0	$1,384
PID CMPT	K.P	11.2727,ENVM	ENVIRO	2727	**7/01/12**	9/06/13	99%	278	0	278	$0	$16,472
PID CMPT	K.P	11.2730,ENVM	ENVIRO	2730	**7/01/12**	9/06/13	99%	8	0	8	$0	$390
PID CMPT	K.P	11.2733,ENVM	ENVIRO	2733	**7/01/12**	9/06/13	99%	3	0	3	$0	$147
PID CMPT	K.P	11.2735,ENVM	ENVIRO	2735	**7/01/12**	9/06/13	99%	6	0	6	$0	$340
PID CMPT	K.P	11.2747,TPLN	PLANNING	2747	**7/01/12**	9/06/13	99%	44	0	44	$0	$723
PID CMPT	K.P	11.2759,PPM	PPM	2759	**7/01/12**	9/06/13	99%	2,321	0	2,321	$0	$185,317
PID CMPT	K.P	11.2765,I576	I-5/SR-76	2765	**7/01/12**	9/06/13	99%	317	0	317	$0	$28,046
PID CMPT	K.P	11.2795,DSGN	DESIGN	2795	**7/01/12**	9/06/13	99%	4	0	4	$0	$194
PID CMPT	K.P	11.2796,DSGN	DESIGN	2796	**7/01/12**	9/06/13	99%	79	0	79	$0	$6,675
PID CMPT	K.P	11.2799,SURV	LAND SURVEYS	2799	**7/01/12**	9/06/13	99%	3	0	3	$0	$254
PID CMPT	K.P	11.2801,SURV	LAND SURVEYS	2801	**7/01/12**	9/06/13	99%	40	0	40	$0	$3,381
PID CMPT	K.P	11.2804,ESRV	ENG SVS	2804	**7/01/12**	9/06/13	99%	95	0	95	$0	$6,365
PID CMPT	K.P	11.2810,ENVM	ENVIRO	2810	**7/01/12**	9/06/13	99%	69	0	69	$0	$5,868
PID CMPT	K.P	11.2811,ENVM	ENVIRO	2811	**7/01/12**	9/06/13	99%	7	0	7	$0	$592
PID CMPT	K.P	11.2817,ENVM	ENVIRO	2817	**7/01/12**	9/06/13	99%	4	0	4	$0	$299
PID CMPT	K.P	11.2819,ENVM	ENVIRO	2819	**7/01/12**	9/06/13	99%	6	0	6	$0	$510
PID CMPT	K.P	11.2823,TROP	TRAFFIC	2823	**7/01/12**	9/06/13	99%	1	0	1	$0	$75
PID CMPT	K.P	11.2824,TROP	TRAFFIC	2824	**7/01/12**	9/06/13	99%	8	0	8	$0	$649
PID CMPT	K.P	11.2827,TROP	TRAFFIC	2827	**7/01/12**	9/06/13	99%	5	0	5	$0	$423
PID CMPT	K.P	11.2829,TROP	TRAFFIC	2829	**7/01/12**	9/06/13	99%	12	0	12	$0	$897
PID CMPT	K.P	11.2831,TROP	TRAFFIC	2831	**7/01/12**	9/06/13	99%	3	0	3	$0	$271
PID CMPT	K.P	11.2833,ESRV	ENG SVS	2833	**7/01/12**	9/06/13	99%	5	0	5	$0	$439
PID CMPT	K.P	11.4119,RWLS	R/W	4119	**7/01/12**	9/06/13	99%	63	0	63	$0	$3,647
PID CMPT	K.P	53.3420,PRJD	HQ Design	3420	**7/01/12**	9/06/13	99%	0	0	0	$0	-$11
PID CMPT	K.P	59.3564,PPM	DES	3564	**7/01/12**	9/06/13	99%	9	0	9	$0	$911
PID CMPT	K.P	59.3587,SDSN	DES	3587	**7/01/12**	9/06/13	99%	201	0	201	$0	$13,297
PID CMPT	K.P	59.3602,SDSN	DES	3602	**7/01/12**	9/06/13	99%	8	0	8	$0	$797
PID CMPT	K.P	59.3639,SDSN	DES	3639	**7/01/12**	9/06/13	99%	25	0	25	$0	$2,480
PID CMPT	K.P	59.3648,SDSN	DES	3648	**7/01/12**	9/06/13	99%	611	0	611	$0	$47,344
PID CMPT	K.P	59.3659,GS	DES	3659	**7/01/12**	9/06/13	99%	16	0	16	$0	$1,380
PID CMPT	K.P	59.3668,SCON	DES	3668	**7/01/12**	9/06/13	99%	7	0	7	$0	$592
PID CMPT	K.P	EXPENSE	Various		**7/01/12**	9/06/13	99%	12	0	12	$0	$42,775

EXHIBIT 19

ETC Details for Project

PID CMPT	K.P	LABOR	Various		**7/01/12**	9/06/13	99%	0	0	0	$0	$0
All Tasks: 253 records					**7/01/12**	**11/29/21**	**11%**	**9,481**	**58,815**	**68,296**	**$7,191,413**	**$7,987,474**

EXHIBIT 19

D11 Financials for 2T240

District 11
PMSU

These are NOT offical financial figures.

Project: 11-2T240, 1112000131

JEWEL, KAREN M, SD-015-30.6R/32R, HOV CONNECTORS

Effective: Approved Budget: 3/16/15 Expended (E-FIS): 3/16/15 ETC (PRSM): 3/16/15

Details: Funding List (PRSM) Expenditures by Bucket ETC Details Support Cost Estimate Summary (11 Page Estimate)

EAC / Budget Color Key: < 80% | 80-99% | 100-120% | > 120%

	PA&ED	PS&E	RW	CON	RW Cap	CON Cap	Total
HQ Financials							
Approved Budget (PRSM)	0	0	0	0	0	0	0
Expended (FIDO + EFIS)	0	0	0	0	0	0	0
- Expended / Budget	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
- ETC (PRSM)	6,963,313	0	141,022	0	0	0	7,104,335
EAC (Expended + ETC)	6,963,313	0	141,022	0	0	0	7,104,335
Difference (Budget - EAC)	-6,963,313	0	-141,022	0	0	0	-7,104,335
EAC / Budget	1,000.00%	0.00%	1,000.00%	0.00%	0.00%	0.00%	1,000.00%
Not included in HQF							
Expended (FIDO + EFIS)	0	0	0	0	0	0	0
						Other (PID, Misc., Unknown) Amount:	797,102

EXHIBIT 20