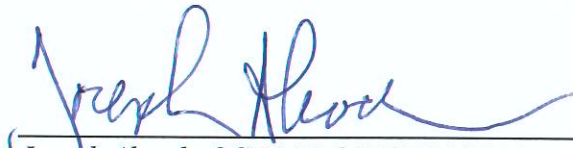


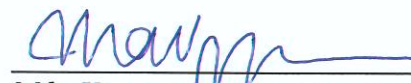
**Project Study Report-Project Development Support  
(PSR-PDS)  
To  
Request Programming for Capital Support  
(Project Approval and Environmental Document Phase)  
in the 2016 STIP  
and  
Request Approval of a Locally Funded  
Project to Proceed to Project Approval and  
Environmental Document Phase**

On Interstate 605 (I-605)

At Katella Avenue Interchange

APPROVAL RECOMMENDED:

  
\_\_\_\_\_  
*Joseph Alcock, OCTA PROJECT MANAGER, PROJECT SPONSOR,  
Accepts Risks Identified in this PSR-PDS and Attached Risk Register*

  
\_\_\_\_\_  
*Mike Varipapa, P.E., CALTRANS PROJECT MANAGER*

  
\_\_\_\_\_  
*Constantino Stamation, P.E., BRANCH CHIEF, ADVANCE PLANNING -  
PROJECT STUDIES*

APPROVED:

  
\_\_\_\_\_  
*ANW Ryan Chamberlain, DISTRICT DIRECTOR*

5/11/15  
DATE

CONCURRENCE BY:

ENVIRONMENTAL:



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*Smita Deshpande, BRANCH CHIEF*  
*DEPARTMENT OF ENVIRONMENTAL ANALYSIS, GENERALISTS*

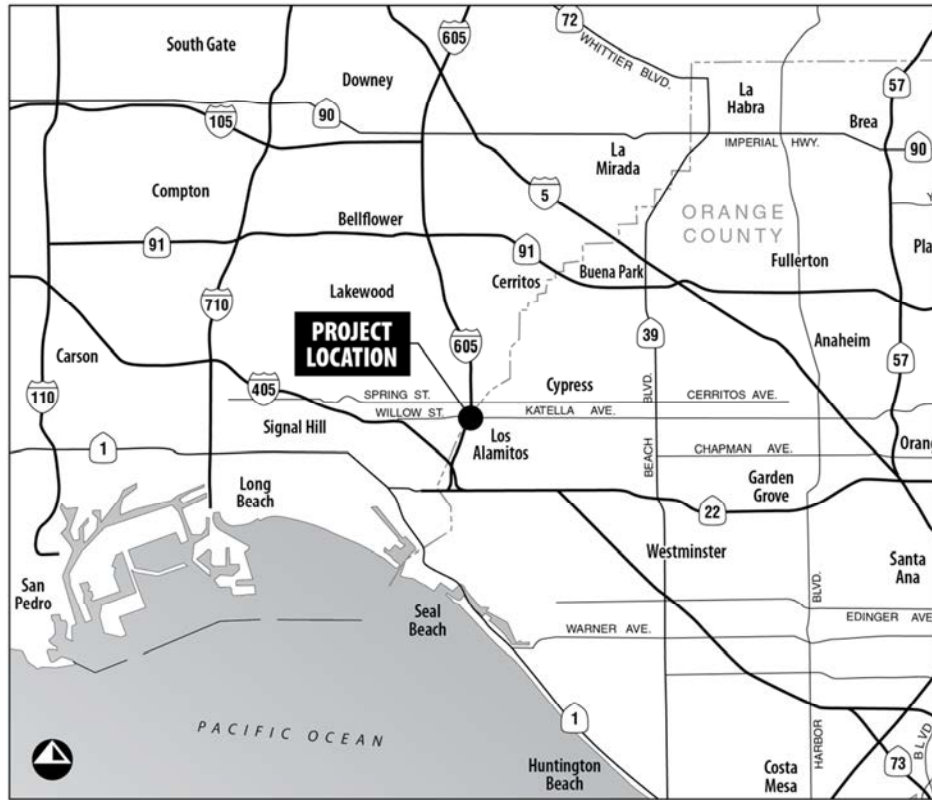
DESIGN:



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*Tam Nguyen, P.E., OFFICE CHIEF*  
*OFFICE OF DESIGN*

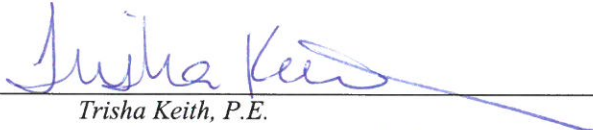
## Vicinity Map



On I-605

At Katella Avenue Interchange

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.

  
Trisha Keith, P.E.  
REGISTERED CIVIL ENGINEER

3/17/15  
DATE



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## 1. INTRODUCTION

The Orange County Transportation Authority (OCTA), in cooperation with the California Department of Transportation (Caltrans) District 12 and the City of Los Alamitos, proposes to improve the local interchange at Interstate 605 (I-605) and Katella Avenue to improve freeway access and arterial connection, improve interchange traffic operations, enhance safety, and improve pedestrian and bicycle facilities within the interchange area. The proposed improvements are identified as Project M in OCTA’s Renewed Measure M (Measure M2) Freeway Program. The project area for this Project Study Report-Project Development Support (PSR-PDS) includes the interchange and Katella Avenue between Coyote Creek Channel and Civic Center Drive. A segment of Katella Avenue east of the project limits, from Civic Center Drive to Los Alamitos Boulevard, has been studied concurrently to evaluate potential improvements that would complement those proposed in this project. The results of this analysis will be summarized in a separate technical memorandum which may be used by the City of Los Alamitos to pursue funds for a future project. This PSR-PDS includes four alternatives, including a no build alternative. The three build alternatives would modify interchange ramps and lane configurations on Katella Avenue, without altering the existing bridge structures. Alternative 4 would require construction of two new bridges. Table 1.1 summarizes the project information.

**Table 1.1 Project Information**

<b>Project Limits</b>	12-Ora-605 PM 1.1/PM 1.6
<b>Number of Alternatives</b>	Alternative 1: No Build Alternative Alternative 2: Northbound Ramps and Katella Ave modifications Alternative 3: Alt 2 + Remove SB Loop Entrance Ramp Alternative 4: Alt2 + Braid SB Ramps
<b>Capital Outlay Support for PA&amp;ED</b>	\$250 K to \$1.0 M
<b>Capital Outlay Construction Cost Range</b>	Alternative 2: \$6 M to \$8 M Alternative 3: \$9 M to \$11 M Alternative 4: \$16 M to \$18 M
<b>Capital Outlay Right of Way Cost Range</b>	Alternatives 2, 3, and 4 – \$300 K to 500 K
<b>Funding Source</b>	Measure M2, STIP, federal, and other unidentified funding sources
<b>Type of Facility</b>	Freeway interchange
<b>Number of Structures</b>	Alternatives 2 and 3: n/a Alternative 4: 2 new bridges
<b>Anticipated Environmental Determination or Document</b>	CEQA - Initial Study with Mitigated Negative Declaration (IS/MND), NEPA - Environmental Assessment with Finding of No Significant Impact (EA/FONSI)
<b>Legal Description</b>	N/A
<b>Project Development Category</b>	4B

The remaining support, right of way, and construction components of the project are preliminary estimates and are not suitable for programming purposes. The Project Report will serve as the programming document for the remaining support and capital components of the project. A Project Report will serve as the Caltrans project approval document of the “preferred” alternative.

Project environmental studies are anticipated to begin in mid-2016, and the project approval/environmental document (PA/ED) phase is expected to be completed by June 2018. A construction schedule has not yet been determined; however, the project is included in the M2 Freeway Program.

## **2. BACKGROUND**

### **Interstate 605**

I-605 is a major north-south transportation route within Orange and Los Angeles Counties. It is an integral part of the freeway network for the Southern California metropolitan area, connecting Interstate 405 (I-405) at its southerly terminus to Interstate 210 (I-210) at its northerly terminus. The I-605/Katella Avenue interchange is located on I-605 between I-405 and Spring Street, within the City of Los Alamitos in Orange County (see Attachment A, Regional Vicinity Map). It is a significant access point for development to the east in Los Alamitos and cities beyond. The City of Long Beach and County of Los Angeles borders lie immediately west of the interchange, at the Coyote Creek Channel.

I-605, in the vicinity of the project, has four general purpose lanes in each direction and one high occupancy vehicle (HOV) lane in the northbound direction. In the southbound direction, the left shoulder is approximately 18 feet wide. A concrete barrier in the median separates the two directions of travel. From the I-405 interchange to Katella Avenue, there is an auxiliary lane in each direction and a sound barrier along the northbound right shoulder.

Constructed approximately fifty years ago in the 1960’s in conjunction with the I-605 freeway improvements, the I-605/Katella Avenue interchange configuration is a mix of loop and direct ramp configurations that reflect the constraints of the Coyote Creek Channel. It is a modified full cloverleaf configuration with loop ramps in all quadrants except the southeast quadrant which contains a direct exit ramp from northbound I-605. Existing bridges over Katella Avenue are four-span reinforced concrete box girder bridges supported on concrete pile foundations. A direct exit ramp from southbound I-605 is located to the west of the Coyote Creek Channel, outside the project limits. All ramp termini incorporate free-right movements.

### **Katella Avenue**

Katella Avenue is a key regional arterial in the east-west direction across Orange County. It provides regional access from Los Alamitos to I-605 to the west, where it continues as Willow Street in the City of Long Beach in Los Angeles County. To the east, it connects Los Alamitos to the Cities of Cypress, Stanton, Anaheim, and Garden Grove. It is identified as an 8-Lane Smart Street on the Orange County Master Plan of Arterial Highways and as a Smart Street in the City of Los Alamitos General Plan Circulation Element. Additionally, it is identified as a Truck Route in the City of Los Alamitos General Plan (2010). The project area includes Katella Avenue from Coyote Creek Channel to Civic Center Drive.

At the easterly limits of the project area, Katella Avenue has four travel lanes in each direction. Approaching the interchange in the westbound direction, the No. 4 lane is dropped as a right turn lane onto the northbound I-605 entrance ramp. Continuing west, the No. 1 lane is dropped through a left-hand merge, leaving two through lanes continuing on Willow Street. An auxiliary lane is provided in the westbound direction between the northbound I-605 loop exit ramp and the southbound loop entrance ramp. From the west, two travel lanes approach the interchange in the eastbound direction. Through the interchange, the single-lane southbound loop exit ramp joins Katella Avenue as the No. 3 lane and immediately merges with the No. 2 lane. Continuing east, two lanes are added to Katella Avenue at the northbound I-605 exit ramp, providing four travel lanes to the east. Sidewalk is provided on both sides of Katella Avenue through the interchange; however both facilities terminate on the west side of the interchange before reaching the sidewalks on the Coyote Creek Channel bridge structure. Dedicated bike lanes are not provided through the interchange.

### **Project Sponsors**

Improvements to the I-605/Katella Avenue Interchange will be funded by OCTA as part of the Renewed Measure M (M2) Freeway Program. The interchange improvements are identified as Project M in the program. Moving forward, the project will also seek federal and other funding sources, including STIP funding.

### **Local and Regional Agency Involvement**

Project development has been conducted through a collaboration of OCTA with affected agencies. Caltrans and the City of Los Alamitos have been active members of the project study team (PST) from the beginning of the project development process. Members of their staff have regularly attended meetings and workshops to provide input regarding the purpose and need statement, as well as alternatives design. The County of Orange, Gateway Cities Council of Governments (GCCOG), Los Angeles County Metropolitan Transportation Authority (LACMTA), and the City of Long Beach have received regular project updates through the distribution of meeting minutes and e-mails.

### **Context Sensitive Solutions (CSS) and Complete Streets**

Providing complete streets has been an important consideration in the development of the project. Standard shoulders are proposed along Katella Avenue, which will facilitate bicycle use and connectivity through the project area. Pedestrian facilities will be improved along westbound Katella Avenue by reducing the number of free-right movements at ramp intersections. Additionally, the project will provide sidewalk connectivity to the Coyote Creek Bike Trail on both sides of Katella Avenue. During future project development phases, additional opportunities to incorporate complete streets concepts into the proposed improvements should be considered.

Caltrans uses CSS as an approach to plan, design, construct, maintain, and operate its transportation system aligned with its mission, vision, and goals. CSS employs a collaborative, interdisciplinary approach involving all stakeholders to promote concepts that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. As the project progresses through the PA/ED phase, the



incorporation of CSS should be implemented through coordination amongst the PDT. CSS will be considered in the design of new structures, including bridges and retaining walls, to preserve and enhance the aesthetics of the adjacent communities. Project design shall consider features such as light standards or softscape treatments such as re-vegetation, or other landscape treatments to reduce visual impacts and enhance the aesthetic quality of the various project components.

A series of public workshops and/or potential interviews with stakeholders and property owners are anticipated during PA/ED to solicit input and ensure that the project is consistent with the community's values.

### **3. PURPOSE AND NEED**

#### **Need**

The I-605/Katella Avenue interchange currently experiences congestion during peak periods and has existing geometric elements that do not provide needed optimal traffic operations. The interchange has a high concentration of congestion-related accidents and the interchange currently has discontinuous facilities for both pedestrians and bicycle traffic.

#### **Purpose**

The purpose of the project is to improve freeway access and arterial connection, improve interchange traffic operations, enhance safety, and improve pedestrian and bicycle facilities within the project limits while minimizing adjacent right of way, environmental, and economic impacts.

### **4. TRAFFIC ENGINEERING PERFORMANCE ASSESSMENT**

A Traffic Engineering Performance Assessment (TEPA) was prepared for this project to provide a macro-level assessment of readily available traffic information relevant to this project in support of the purpose and need statement. The TEPA also describes the scope and magnitude of proposed traffic engineering studies that will be performed in the PA/ED phase. Existing (year 2012) and design year (2050) projected traffic conditions were evaluated for the No Build alternative and three build alternatives. The TEPA serves as a reference document for this PSR-PDS and is included in the project files.

Existing traffic volumes were collected from the *Congestion Hot Spots Study* for the *SR 91/I-605/I-405 Corridor Study*, completed in 2012, and OCTA. Future year 2050 traffic volumes were forecasted using the OCTAM 3.4.1 travel demand model. The HCM 2010 method for freeways was used to estimate the capacity and to determine the level of service (LOS). Detailed methodologies and analysis can be found in the TEPA. Key findings are summarized herein.

#### **Freeway Mainline and Ramp Junctions**

The basic freeway segment analysis results indicated that the northbound and southbound I-605 mainline operates at LOS D or better in the existing condition within the study area, and is expected to operate at LOS D or better in the design year (2050) No Build and three build alternative conditions. The three build alternatives showed no change in basic freeway segment volumes and LOS, as there would be no modifications to the mainline.

The freeway ramp junction analysis indicated LOS D or better for all ramp junctions in the existing and design year (2050) No Build and build alternative conditions. Level of service for the northbound I-605/Katella Avenue exit ramp junction is expected to improve from LOS D to LOS B (AM peak hour) and from LOS C to LOS B (PM peak hour) for all build alternatives due to the addition of a lane at the ramp junction.

### **Weaving**

Weaving analyses were prepared for the southbound freeway collector-distributor (C-D) road and the segment of westbound Katella between the northbound and southbound ramps. The southbound freeway C-D road analysis resulted in LOS B in both the existing and future No Build conditions. It may be noted that, although the HCM analysis indicated LOS B in the existing and future No Build conditions, field observation and anecdotal evidence suggest that the C-D road experiences peak hour congestion that may be better quantified in the detailed traffic analysis to be conducted in the PA/ED phase of design. Improvements proposed as part of Alternative 2 would not modify the ramp geometries with respect to weaving; therefore, no change was indicated in the LOS. Alternatives 3 and 4 would improve traffic operations by eliminating the weave entirely.

On the segment of westbound Katella Avenue between the northbound and southbound ramps, the weaving analysis resulted in LOS C or better in the existing and future No Build conditions. All three build alternatives would improve traffic operations by eliminating this weave.

### **Intersections**

The intersection of the northbound I-605 ramps and Katella Avenue currently operates at LOS A. It is expected to continue operating at LOS A in the design year (2050) No Build condition, with a small increase in delay. The three build alternatives would modify the entrance ramp terminus, which is expected to result in LOS A in the AM peak hour and LOS B in the PM peak hour.

Alternative 3 would modify the intersection of the southbound I-605 entrance ramps and Katella Avenue, resulting in a second signalized intersection in the project area. This intersection is expected to operate at LOS B in the design year (2050) condition.

### **Additional Analysis**

To supplement the HCM analysis, Caltrans Performance Measurement System (PeMS) speed data was reviewed to evaluate existing congestion activity based on actual speeds. Additionally, an initial review of existing traffic collision data from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS) collision data was performed to evaluate potential safety issues within the project area. Details of these reviews are discussed in the Deficiencies section of this document. More detailed analysis will be conducted during the PA/ED phase of project development.

### **Findings**

The TEPA analyses showed that all three build alternatives are similar in traffic operations and will result in satisfactory level of service. Relative to the No Build alternative, all build alternatives are expected to provide improved operations on the northbound exit ramp and on

westbound Katella Avenue between the northbound and southbound ramps. Alternatives 3 and 4 would provide additional operational benefit by eliminating the weaving segment on the southbound C-D road. Alternative 3 would add a second signalized intersection, which is expected to operate at LOS B.

### **Recommended Traffic Studies**

For PA/ED, it is recommended that a traffic model be coded, with separate model runs for each alternative. Traffic forecasts should include average daily traffic volumes, peak hour basic freeway segment and ramp volumes, as well as intersection turning movement volumes. Truck percentages will be estimated for the freeway mainline. A Traffic Impact/Circulation Study should be prepared that includes the following components:

- Freeway Analysis
  - Basic Freeway Segment Analysis
  - Ramp Junction Analysis
  - Weaving Section Analysis
- Intersection Analysis
- Queuing Analysis
- Ramp metering System Analysis

In addition to the traffic study described above, a traffic micro simulation analysis using VISSIM or equivalent software is recommended to study the Katella Avenue/I-605 corridor. Such a simulation would account for the influences of congestion on adjacent locations and would provide a better representation of the conditions within the corridor and at the study intersections.

A safety assessment should be conducted in which the most recent three years of collision data are collected from Caltrans and analyzed to ensure that the proposed improvements would enhance safety and would not contribute to additional accidents.

## **5. DEFICIENCIES**

The I-605/Katella Avenue interchange currently experiences congestion during peak periods along the southbound ramps C-D road, northbound exit ramp, and eastbound Katella Avenue. Lane configurations and roadway geometrics are not optimal at several locations within the interchange. Additionally, bicycle and pedestrian facilities are discontinuous within the project area.

### **Traffic Operations**

Overall, the HCM analyses represent acceptable operating conditions and levels of service throughout the project area in the existing and design year (2050) conditions. However, the results of this preliminary level of traffic analysis are not entirely consistent with congestion observed in the field because the HCM methodologies cannot fully capture the complexities and interrelationships of the movements within the interchange, including multiple merges, lane drops, and weaves. Congestion was observed in the field on the northbound I-605 exit ramp, the southbound C-D road, and along eastbound Katella Avenue during peak times, which backs up to I-605 and influences interchange operations.

Caltrans Performance Measurement System (PeMS) speed data showed that, overall, most segments of the mainline and ramps operate at LOS C or better, with a few exceptions. The diverge for the northbound Katella Avenue exit ramp was shown to operate at LOS D in the AM peak hour. The merge for the northbound Katella Avenue entrance ramp, northbound mainline north of that merge, and the diverge for the southbound Katella Avenue exit ramp were shown to operate at LOS D in the PM peak hour. Speeds on the southbound I-605 mainline, south of the interchange, experience low peak hour speeds, around 22 to 26 miles per hour.

California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS) collision data show that most traffic collisions within the study area were concentrated on the southbound I-605 mainline as it approaches the I-405 interchange, likely due to observed slowing and congestion. Caltrans Traffic Accident Surveillance and Analysis Systems (TASAS) – Transportation Systems Network (TSN) Table B data was obtained for a 3-year period between April 1, 2009 and March 31, 2012. TASAS data show that one freeway mainline location near the interchange and two ramp locations within the interchange have accident rates that exceed the statewide average by 30 percent or more. The freeway location is I-605 southbound segment from Katella Avenue to the Los Angeles County line and the ramp locations were on the southbound entrance ramps. Alternatives 3 and 4 of the proposed project would improve the weave and merge conditions on the southbound ramps, improving flows onto southbound I-605 south of the interchange.

### **Lane Configurations and Merges**

On southbound I-605, the mainline, entrance ramps, and loop exit ramp are joined by one C-D road. Merging and weaving conflicts between the facilities are isolated to the C-D road, which experiences congestion in the AM peak hour due to multiple conflict points affecting upstream traffic.

At the terminus of the southbound I-605 loop exit ramp, a third lane is added to eastbound Katella Avenue via a free-right movement. The third lane then immediately merges with the No. 2 Lane in advance of the northbound I-605 exit ramp, in a distance of less than 200 feet. The northbound I-605 exit ramp has one lane at its terminus, with an uncontrolled free-right movement which transitions into one wide lane that becomes the No. 3 and No. 4 eastbound lanes on Katella Avenue east of the interchange.

The left turn pocket on eastbound Katella Avenue to the northbound I-605 entrance ramp is approximately 115 feet long. As a result of excess queues, AM turn movements have been restricted to buses and carpool only, and the ramp entrance lane has been delineated as “Carpool Only.” Two additional lanes join this lane from westbound Katella Avenue through a free-right turn movement. The left free-right lane is also delineated as an HOV lane, and merges immediately with the lane from eastbound Katella Avenue over a short distance of approximately 125 feet, with no advance signage.

On westbound Katella Avenue, an unconventional left-hand merge of the No. 1 lane with the No. 2 lane occurs just west of the northbound I-605 entrance ramp intersection. Along the same

segment of Katella Avenue, a short 450-foot long auxiliary lane creates a weaving conflict between the northbound I-605 loop exit ramp and the southbound I-605 loop entrance ramp.

### **Bicycle and Pedestrian Facilities**

Although the modified cloverleaf interchange design generally provides a high level of operations for vehicles as a result of uncontrolled free-right movements, it is not optimal for accommodating bicycle or pedestrian movements. Right shoulders, which can serve bicycle traffic, are absent along westbound Katella Avenue through the project limits and beyond to the San Gabriel River. On eastbound Katella Avenue, right shoulders are absent east of the northbound exit ramp, through the City of Los Alamitos and beyond. Lane drops and additions as part of free-right turn movements at the ramps also create challenging conflict areas for bicyclists. Pedestrian crossings occur across uncontrolled high-speed free-right turn movements at all but one ramp location. Pedestrian facilities on both sides of Katella Avenue are discontinuous at the west end of the interchange. On the westbound side, an unmarked crossing at the entrance of the southbound I-605 loop entrance ramp leads to a curb ramp surrounded by vegetation, with no sidewalk beyond. For pedestrians traveling west on the eastbound side of Katella Avenue, the crosswalk at the entrance of the southbound I-605 direct entrance ramp leads to asphalt dike and metal guard railing at the edge of shoulder, with no sidewalk or curb ramp. From there, pedestrians must walk on the roadway shoulder to continue west. Beyond the interchange, there are no sidewalks on either side of Willow Street for approximately one mile, with the exception of sidewalk barriers on the bridges over Coyote Creek, an access road, San Gabriel River, and a golf course path.

No secondary deficiencies have been identified at this time.

## **6. CORRIDOR AND SYSTEM COORDINATION**

The proposed project is consistent with statewide, regional, and local planning documents and projects described below. During PA/ED, coordination should continue to identify and ensure project consistency with these planning efforts.

I-605 is a Surface Transportation Assistance Act (STAA) route on the National Network. Katella Avenue, from the interchange east to the Joint Forces Training Center (formerly Los Alamitos Army Airfield), is a Major Strategic Highway Network (STRAHNET) connector. It is designated an 8-Lane Smart Street in the OCTA 2013 Master Plan of Arterial Highways from Los Alamitos Boulevard to the Orange County line.

A Transportation Concept Report (TCR) and Route Concept Report (RCR) for I-605, which would typically provide concept and ultimate configurations for I-605 within Caltrans District 12, are not currently available. The I-605 TCR for District 7, dated July 2013, includes a 2035 concept for the portion of I-605 immediately north of the interchange. This concept calls for a facility with 8 mixed flow lanes and 2 HOV lanes. The Caltrans District 12 System Management Plan (DSMP), completed in November 2014, includes improvements to the I-605/Katella Avenue interchange in Appendix D as one of the District 12 projects under the M2020 program. The Orange County SR-22/I-405/I-605 Corridor System Management Plan (CSMP) Final Report, approved November 2010, identified HOV connectors between I-405 and I-605 which

were included in the traffic model for this project but will not physically impact the portion of I-605 within the project area.

The 2012 Regional Transportation Plan (RTP), titled “2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future”, adopted by Southern California Association of Governments (SCAG) in April 2012 and amended in September 2014, and the 2015 Federal Transportation Improvement Program (FTIP) adopted by SCAG’s Executive/Administration Committee in September 2014 include improvements to I-605, Katella Avenue, Willow Street, and the interchange in the following projects:

- RTP Project ID#ORA000193 / FTIP Project ID# ORA000194  
Route I-405 - HOV connectors from I-405 to I-605, between Katella Ave. (I-605 PM R001.104) and Seal Beach Blvd. (I-405 PM 022.643), with a second HOV lane in each direction on I-405 between the two direct connectors.
- RTP Project ID# 2M0719  
Route I-605 - Katella On-Ramp. Improve Interchange.
- RTP Project ID# 1NL04 / FTIP Project ID# LAF1528  
San Gabriel River Bike Path Gap Closure at Willow Street. Creation of off-street bicycle path to achieve bicycle route gap closure on Willow Street from the San Gabriel River Bike Path west to Studebaker Road. Bike path distance 5 miles.

The OCTA draft 2014 Long Range Transportation Plan (Outlook 2035) identifies a Preferred Plan that completes Measure M2 commitments. As an M2 project, I-605 at Katella Avenue Interchange Improvements are included in the Preferred Plan.

The SR 91/I-605/I-405 Congestion Hot Spots Feasibility Report, prepared for LACMTA and Gateway Cities COG in 2013 identified potential improvements to the I-605/Katella Avenue northbound entrance ramp.

The I-605/I-405 System Interchange Feasibility Study currently being prepared for LACMTA in association with OCTA includes improvements at the I-605/I-405 interchange. This study has recently commenced, and is unlikely to extend to the I-605/Katella Avenue interchange.

In addition to the Class I bikeway mentioned as part of RTP, the City of Long Beach is developing design plans for Class II bike lanes on both sides of Willow Street from the San Gabriel River (the current easterly terminus of the Willow Street Class II bike lanes and future terminus of the Class I bike trail) to the I-605 interchange. These proposed bike lanes will provide access to the Coyote Creek Bike Trail from the west. The proposed project alternatives are compatible with the proposed bike lanes.

## 7. ALTERNATIVES

This PSR-PDS evaluates alternatives to improve freeway access, traffic operations, safety, and bicycle and pedestrian facilities. All of the proposed build alternatives satisfy the project purpose and need, as described in Section 3 and approved by the PST and Caltrans staff.

The project development process began by identifying key focus areas throughout the interchange where geometric, operational, or safety improvements are needed. Potential improvements to the focus areas were developed by the PST and then presented to Caltrans functional units in a workshop setting in which each improvement area was evaluated for potential benefits and conflicts. Based on the input received from Caltrans during the workshop, favorable improvements were combined to develop three build alternatives. These alternatives were reviewed by the PST and Caltrans staff, and then refined based on comments provided.

Each of the build alternatives includes modifications to interchange ramps and Katella Avenue. The existing I-605 mainline would not be modified, with the exception of the northbound No. 4 lane at the northbound exit ramp. This lane would be restriped to provide a through lane/ramp exit option to accommodate a proposed 2<sup>nd</sup> lane on the exit ramp. Katella Avenue would be widened and lane geometries would be modified to provide standard lanes and shoulders through the interchange and to tie in with proposed ramp improvements. Proposed modifications to the northbound ramps and Katella Avenue east of the northbound ramps are similar in all three build alternatives.

The project area includes the interchange ramps and Katella Avenue from the Coyote Creek Channel bridge to Civic Center Drive. Right of way acquisition of less than 0.1 acre of parkway may be required on the north side of Katella Avenue from the interchange to the study area limits. Widening on the south side of Katella Avenue would occur within an existing Orange County Flood Division (OC Flood) easement. No other permanent right of way acquisitions are anticipated. See Section 8, Right of Way, for additional right of way information.

Katella Avenue typical sections at I-605 mainline and immediately east of the interchange are provided in Attachment B. Additional details of each alternative are provided below:

### 7.1 Alternative 1 – No Build

Under this alternative, no reconstruction or improvements would be made to the existing I-605 / Katella Avenue interchange other than routine roadway maintenance and currently approved improvements. This alternative does not address the need and purpose of this project. See Attachment C-1 for the No Build Alternative.

### 7.2 Alternative 2 – Northbound Ramps Modifications

This alternative would focus on improvements to the northbound interchange ramps and Katella Avenue. See Attachment C-2 for the proposed Alternative 2 improvements plan.

On westbound Katella Avenue, improvements would begin at Civic Center Drive, where the existing lanes and shoulders would be widened to standard widths. The ramp termini of the northbound entrance and loop exit ramps would be reconfigured to eliminate the existing free-

right turn movements and the short entrance ramp merge. The No. 4 westbound lane would transition to a right turn lane at the intersection, creating a trap lane similar to existing conditions, but without the high-speed right turn movement onto the ramp. The resulting signalized tee-intersection would provide a shorter crossing and better visibility for pedestrians and bicyclists. It would also extend the distance between the northbound loop exit and southbound loop entrance ramps and improve the weave between the No. 2 and No. 3 lanes. Continuing west on Katella Avenue, the existing left-hand merge of the No. 1 and No. 2 lanes would be eliminated, and the three through lanes would transition to two through lanes and a right turn lane for the southbound loop entrance ramp. This would again create a trap lane, for which proper advance signing would be provided. The terminus of the southbound loop entrance ramp would be modified to provide a smooth transition and continuous standard right shoulder from Katella Avenue onto the ramp. Beyond the southbound loop entrance ramp, westbound Katella Avenue would continue with two standard lanes and standard shoulders until they taper to match existing widths at the Coyote Creek bridge. Standard sidewalk and curb ramps would be constructed along the length of improvements along westbound Katella Avenue.

On eastbound Katella Avenue, improvements would begin at the existing access road adjacent to Coyote Creek Trail, where sidewalk and curb and gutter would be added from the access point to the existing southbound direct entrance ramp pedestrian crossing. At the southbound loop exit ramp terminus, a third through lane would be added to Katella Avenue to eliminate the existing abrupt No. 3 lane merge, and a standard right shoulder would be added. Continuing east, the terminus of the northbound exit ramp would be modified to join Katella Avenue as the No. 4 lane, replacing the existing two-lane addition. In the median, the existing eastbound left turn pocket to the northbound entrance ramp would be lengthened to provide additional storage without impacting existing bridge columns. Beyond the northbound ramps, Katella Avenue would continue east with four standard width lanes and shoulders until they taper to match existing widths at Civic Center Drive. Standard sidewalk and curb ramps would be constructed along the length of proposed roadway improvements along eastbound Katella Avenue, and would tie into existing improvements.

The northbound exit ramp would be widened at the I-605 mainline to provide two lanes for high exit volumes. The No. 4 general purpose lane would be restriped from a through lane to an option lane, where vehicles could exit to the No. 1 lane on the ramp. The existing auxiliary lane would exit to the No. 2 lane on the ramp. The exit ramp would be widened from the mainline to the existing divergence point, where the loop ramp continues to westbound Katella Avenue/Willow Street and the direct ramp continues to eastbound Katella Avenue. All widening would take place along the inside edge of the ramp, so the existing retaining wall and sound wall along the outside edge of shoulder could be protected in place. The overhead freeway sign located at the northbound exit ramp divergence point would be modified to reflect the new exit lane configuration. Freeway signage upstream of the ramp would also be modified as needed to provide proper advance guidance.

#### Bridges and Retaining Walls

No bridges or retaining walls would be modified or constructed as part of Alternative 2.



### Traffic Signals

Existing traffic signals at the intersections of Katella Avenue at the northbound ramps and Civic Center Drive would be modified to accommodate changes to intersection geometries and lane configurations.

### **7.3 Alternative 3 – Remove Southbound Loop Entrance Ramp**

This alternative would include improvements to the northbound ramps and Katella Avenue east of the northbound ramps as described in Alternative 2, above. To the west of the northbound ramps, this alternative would remove the southbound loop entrance ramp. See Attachment C-3 for the proposed Alternative 3 improvements plan.

On westbound Katella Avenue, improvements would begin at Civic Center Drive and continue to the northbound ramps with improvements similar to those described in Alternative 2. Continuing west on Katella Avenue, the existing left-hand merge of the No. 1 and No. 2 lanes would be eliminated, and the three through lanes would transition to two through lanes and a left turn lane for the southbound direct entrance ramp. This would create a trap lane, which would be signed accordingly. A second left turn lane would be added as a turn pocket in the median, west of the existing bridge columns. The addition of left turn lanes on westbound Katella Avenue would provide access to southbound I-605 currently served by the existing southbound loop entrance ramp. As a result, the loop entrance ramp would be removed, thereby eliminating the right turn conflict between pedestrians, bicyclists, and vehicles along westbound Katella Avenue at this location. Beyond the southbound entrance ramp, westbound Katella Avenue would continue with two standard lanes and standard shoulders until they taper to match existing widths at the bridge. Standard sidewalk and curb ramps would be constructed along the length of improvements along westbound Katella Avenue.

Removal of the southbound loop entrance ramp, described above, would eliminate use of the southbound C-D ramp by vehicles entering the southbound I-605 mainline from Katella Avenue. As a result, the C-D ramp would be restriped as a single lane facility, joining the mainline to the existing loop exit ramp only, with no weave or merge. The portion of the C-D ramp between the existing loop exit and direct entrance ramps would be removed to preclude use of the C-D ramp as a mainline bypass.

On eastbound Katella Avenue, improvements would begin at the existing access road adjacent to Coyote Creek Trail, where existing lanes and shoulders would be widened to standard widths. A right turn lane would be added in advance of the southbound entrance ramp to reduce conflicts between eastbound through and right turn movements. The terminus of the southbound direct entrance ramp would be modified to accept vehicles from the eastbound right turn lane and dual westbound left turn lanes. As a result, the ramp would have three lanes and would be widened over much of its length to provide a standard taper from three lanes to one lane before it joins the mainline. Continuing east, a third through lane would be added to Katella Avenue at the terminus of the southbound loop exit ramp, to eliminate the existing abrupt lane merge. Following the lane addition, proposed improvements would continue to Civic Center Drive, similar to those described in Alternative 2. Sidewalk would be constructed along eastbound Katella Avenue from the westerly project limit to the southbound entrance ramp, where a crossing to the north side of Katella Avenue would be provided. Existing sidewalk would be

removed from the southbound entrance ramp to Civic Center Drive. See Section 7.5 for further discussion regarding sidewalks.

The northbound exit ramp would be widened at the I-605 mainline to provide two lanes for high exit volumes, as described in Alternative 2.

#### Bridges and Retaining Walls

No bridges would be modified or constructed as part of Alternative 3. A retaining wall would be required along much of the southbound direct entrance ramp widening to avoid right of way impacts. This wall has been assumed as a Type 1 retaining wall on spread footing for preliminary cost purposes.

#### Traffic Signals

A new signal would be provided at the intersection of Katella Avenue and the southbound entrance ramp to accommodate westbound left turn movements onto the ramp and a pedestrian crossing on the west leg of the intersection. The existing traffic signals at the intersections of Katella Avenue at the northbound ramps and Civic Center Drive would be modified to accommodate changes to intersection geometries and lane configurations.

### **7.4 Alternative 4 – Southbound Ramps Braid**

This alternative would include improvements to the northbound ramps and Katella Avenue east of the northbound ramps as described in Alternatives 2 and 3, above. To the west of the northbound ramps, this alternative would braid the southbound ramps. See Attachment C-4 for the proposed Alternative 4 improvements plan.

On westbound Katella Avenue, improvements would begin at Civic Center Drive and continue to the northbound ramps with improvements similar to those described in Alternative 2. Continuing west on Katella Avenue, the existing left-hand merge of the No. 1 and No. 2 lanes would be eliminated, and the three through lanes would transition to two through lanes and a right turn lane for the southbound loop entrance ramp. This would create a trap lane, for which proper advance signing would be provided. The southbound loop entrance ramp would be reconstructed, as described below. Beyond the southbound loop entrance ramp, Katella Avenue would continue with two standard lanes and standard shoulders until they taper to match existing widths at the Coyote Creek bridge. Standard sidewalk and curb ramps would be constructed along the length of improvements along westbound Katella Avenue.

On eastbound Katella Avenue, improvements would begin at the existing access road adjacent to Coyote Creek Trail, where existing lanes and shoulders would be widened to standard widths. A right turn lane would be added in advance of the southbound entrance ramp to reduce conflicts between eastbound through and right turn movements. The termini of the southbound direct entrance and loop exit ramps would be reconstructed with free-right movements as part of ramp reconfigurations described below. Continuing east, a third through lane would be added to Katella Avenue at the terminus of the southbound loop exit ramp, to replace the existing abrupt lane merge. Following the lane addition, proposed improvements would continue to Civic Center Drive, similar to those described in Alternative 2. Standard sidewalk and curb ramps

would be constructed along the length of improvements along eastbound Katella Avenue, and would tie into existing sidewalk near Civic Center Drive.

On the west side of the interchange, the three southbound ramps would be reconstructed. Both entrance ramp alignments would be modified to separate them from the existing southbound C-D ramp and eliminate the associated weave and merge. The southbound loop exit ramp would also be reconstructed, and would tie into the existing C-D ramp south of the Katella Avenue bridge. Similar to Alternative 3, the C-D ramp would be restriped as a single lane exit facility, joining the southbound loop exit ramp and mainline only. The portion of the C-D ramp between the existing loop exit and direct entrance ramps would be removed to preclude use of the C-D ramp as a mainline bypass. Conceptual profiles and superelevation diagrams have been prepared for the three southbound ramp realignments based on limited information from interchange as-builts. They are included as Attachment C-4A, Alternative 4 Southbound Ramps Profiles and Superelevation Diagrams.

As described in Alternative 2, the northbound exit ramp would be widened at the I-605 mainline to provide two lanes for high exit volumes.

#### Bridges and Retaining Walls

New bridge structures would be required for the realigned southbound loop entrance ramp crossings over Katella Avenue and the realigned loop exit ramp. Based on available data, it assumed that both bridges would be pre-stressed concrete cast-in-place boxes.

The portion of the existing C-D road south of Katella Avenue would be reconstructed at a lower elevation to join the new southbound loop exit ramp. This reconstruction would require a retaining wall between the I-605 southbound mainline and the reconstructed ramp. For cost planning purposes, this wall has been assumed to be a tie back retaining wall. Retaining walls would also be needed along the southbound direct entrance ramp to accommodate vertical differentials with the southbound loop exit ramp and to avoid right of way acquisitions. Estimated costs for these walls were based on Type 1 retaining walls on spread footings.

#### Traffic Signals

The existing traffic signals at the intersections of Katella Avenue at the northbound ramps and Civic Center Drive would be modified to accommodate changes to intersection geometries and lane configurations.

### **7.5 Nonstandard Features**

Nonstandard features have been identified in the proposed alternatives based on post May 7<sup>th</sup>, 2012 Caltrans Highway Design Manual (HDM) 6<sup>th</sup> Edition standards. Attachment D provides an inventory of the design standards and their respective dispositions for this project. The analysis performed during the PSR-PDS phase is based on a preliminary level of design detail and existing condition information. Further analysis will be performed in the PA/ED phase. Fact sheets for exceptions to design standards will be prepared to document nonstandard features prior to completion of the PA/ED phase of the project. The identified nonstandard features are described below. The mandatory design standards risk assessment is provided in Table 7.1. The advisory design standards risk assessment is provided in Table 7.2.

**Table 7.1: Mandatory Design Standards Risk Assessment**

Alt(s)	Mandatory Design Standard from Highway Design Manual Tables 82.1A	Probability of Design Exception Approval	Justification for Probability Rating
4	<p><u>202.2(1) – Superelevation</u>  <i>Based on an emax selected by the designer for one of the conditions, superelevation rates from Table 202.2 shall be used within the given range of curve radii. If less than standard superelevation rates are approved (see index 82.1), Figure 202.2 shall be used to determine superelevation based on the curve radius and maximum comfortable speed.</i></p> <ul style="list-style-type: none"> <li>• SB Loop Entrance Ramp</li> </ul>	Medium	Based on a conceptual alignment for this ramp, two reversing curves would be closely spaced and potentially prevent full superelevation of one of the curves. More detailed design of this ramp in PA/ED could resolve this issue.
2, 3, 4	<p><u>203.2 – Curve Radius</u>  <i>Table 203.2 shall be the minimum radius of curve for a specific design speeds on highways.</i></p> <ul style="list-style-type: none"> <li>• NB Entrance Ramp</li> <li>• SB Direct Entrance Ramp</li> </ul>	High	The existing curves approaching the inlet noses of the NB entrance ramp and SB direct entrance ramp have radii of 200 feet and 300 feet, respectively. These radii are not consistent with the speeds of the approach alignments. Modifying the curve on the NB entrance ramp would require improvements beyond the scope of this project. The curve on the SB direct entrance ramp will not be modified in Alternatives 2 or 3. It will be improved to a radius of 500 feet in Alternative 4. Further improvements would likely require right of way acquisition.
2, 3, 4	<p><u>501.3 – Interchange Spacing</u>  <i>The minimum interchange spacing shall be one mile in urban areas, two miles in rural areas, and two miles between freeway-to-freeway interchanges and other interchanges. The minimum interchange spacing on Interstates outside a Transportation Management Area shall be three miles.</i></p> <ul style="list-style-type: none"> <li>• Katella Ave Interchange</li> </ul>	High	The existing I-605/Katella Avenue interchange is located approximately 0.5 miles south of the I-605/Spring Street interchange and approximately 1.5 miles north of the I-405/I-605 interchange. The location of the Katella Avenue interchange will not be modified as part of this project.

Alt(s)	Mandatory Design Standard from Highway Design Manual Tables 82.1A	Probability of Design Exception Approval	Justification for Probability Rating
2	<p><u>504.8 – Access Control</u>  <i>Access control shall extend at least 50 feet beyond the end of the curb return, ramp radius, or taper.</i></p> <ul style="list-style-type: none"> <li>• SB Direct Entrance Ramp</li> </ul>	High	<p>The entrance to the existing SB direct entrance ramp is located immediately east of an access driveway to the Coyote Creek Channel and bike trail. As proposed, Alternative 2 would not modify this ramp entrance. In Alternatives 3 and 4, the ramp entrance would be reconfigured, and the distance from the driveway to the ramp curb return would be increased to over 100 feet.</p>

**Table 7.2: Advisory Design Standards Risk Assessment**

Alt(s)	Advisory Design Standard from Highway Design Manual Tables 82.1B	Probability of Design Exception Approval	Justification for Probability Rating
4	<p><u>202.5(1) – Superelevation Transitions</u>  <i>A superelevation transition should be designed in accordance with the diagram and tabular data shown in Figure 202.5A to satisfy the requirements of safety, comfort and pleasing appearance.</i></p> <ul style="list-style-type: none"> <li>• SB Loop Entrance Ramp</li> </ul>	High	<p>Based on a conceptual alignment for this ramp, standard superelevation transitions based on the diagram and table may not be possible; however, minimum transitions of 6% per 100 feet would be used. More detailed design of this ramp in PA/ED could resolve this issue.</p>

Alt(s)	Advisory Design Standard from Highway Design Manual Tables 82.1B	Probability of Design Exception Approval	Justification for Probability Rating
2, 3, 4	<p><u>203.5 – Compound Curves</u>  <i>On one-way roads, the larger curve should follow the smaller radius.</i></p> <ul style="list-style-type: none"> <li>• NB Exit Ramp</li> <li>• SB Loop Exit Ramp/C-D Ramp</li> </ul>	High	<p>Improvements include widening the NB exit ramp to two lanes at the mainline exit. In order to avoid impacts to the existing retaining wall and sound wall along the right shoulder, the conceptual alignment required compound curves in which smaller curves follow larger curves; however, the curves radii all exceed the minimum required for the ramp design speed. More detailed design of this ramp in PA/ED could resolve this issue.</p> <p>The existing SB C-D ramp follows the large-radius curve of the mainline and has an existing curve radius of 2,599 feet. From this ramp, vehicles may exit onto the existing SB loop exit ramp, which has a radius of 150 feet. This configuration would be unchanged in Alternatives 2 and 3 and would modified but similar in Alternative 4. The 150-foot curve meets the minimum required radii for the ramp design speed.</p>
2, 3, 4	<p><u>204.3 – Standards for Grade</u>  <i>Minimum grades should be 0.5 percent in snow country and 0.3 percent at other locations.</i></p> <ul style="list-style-type: none"> <li>• Katella Avenue</li> </ul>	High	<p>The existing grade of Katella Avenue east of the interchange is approximately 0.1%. The proposed project would widen Katella Avenue, but does not propose to modify the existing grade of the entire roadway.</p>
2, 3, 4	<p><u>305.1(2) – Median Width (Conventional Highways)</u>  <i>In Urban and Rural Main Street areas, the minimum median width for multilane conventional highways should be 18 feet. For two lane conventional highways, the minimum median width should be 12 feet.</i></p> <ul style="list-style-type: none"> <li>• Katella Avenue</li> </ul>	High	<p>The existing Katella Avenue median width varies from 6.67 feet at the west end of the project to 14 feet wide through the interchange and beyond to the east. The proposed project will modify the existing median at key locations, but will not change the general width. Proposed median modifications will join the existing 6.67-foot wide median to the west and 14-foot wide median to the east.</p>

Alt(s)	Advisory Design Standard from Highway Design Manual Tables 82.1B	Probability of Design Exception Approval	Justification for Probability Rating
2, 3, 4	<p><u>403.6(1) – Turning Traffic (Treatment of Intersections with Right-Turn-Only Lanes)</u>  <i>Locations with right-turn-only lanes should provide a minimum 4-foot width for bicycle use between the right-turn and through lane when bikes are permitted.</i></p> <ul style="list-style-type: none"> <li>• Katella Avenue</li> </ul>	Medium	<p>Right-turn-only lanes are proposed along westbound Katella Avenue at the NB Entrance Ramp and SB Loop Entrance Ramp. Due to the length of these lanes (approximately 740 feet and 580 feet, respectively) a 4-foot wide bike lane was not proposed between the right turn and through lanes due to potential weaving conflicts. A standard 8-foot wide right shoulder is proposed. Further consideration may be given to this design element during PA/ED.</p>
2, 3, 4	<p><u>504.3(1)(d) – Ramps (General Lane Drops)</u>  <u>504.3(2)(b) – Ramps (Ramp Metering – Metered Multilane Ramps)</u>  <i>Depending on approach geometry and speed, the lane drop transition between the limit line and the 6-foot separation point should be accomplished with a taper of between 30:1 and 50:1 (longitudinal to lateral).</i></p> <ul style="list-style-type: none"> <li>• NB Entrance Ramp</li> <li>• SB Direct Entrance Ramp (Alt 3 only)</li> </ul>	High	<p>The existing lane drop on the NB Entrance Ramp is approximately 230 feet, or roughly 19:1. This portion of the ramp will not be modified as part of this project.</p> <p>In Alternative 3, the SB Loop Entrance Ramp would be removed and the SB Direct Entrance Ramp would be widened to 3 lanes at the terminus. Given the length of the ramp, a 30:1 taper would not be possible. However, a 15:1 taper could be provided.</p> <p>Both ramps would meet Mandatory Standard 504.3(1)(d) and 504.3(2)(b), which requires a minimum 15:1 taper.</p>
2, 3, 4	<p><u>504.3(3) – Ramps (Location and Design of Ramp Intersections on the Crossroads)</u>  <i>Where a separate right-turn lane is provided at ramp terminals, the turn lane should not continue as a "free" right.</i></p> <ul style="list-style-type: none"> <li>• NB Exit Ramp</li> <li>• SB Loop Entrance Ramp (Alts 2 &amp; 4)</li> <li>• SB Direct Entrance Ramp</li> <li>• SB Loop Exit Ramp</li> </ul>	High	<p>Elimination of the free right turns at these locations was evaluated by the PST and Caltrans staff, but ultimately not recommended. Considerations included interchange configuration, traffic operations, and pedestrian and bicycle use.</p>

Alt(s)	Advisory Design Standard from Highway Design Manual Tables 82.1B	Probability of Design Exception Approval	Justification for Probability Rating
2, 3, 4	<p><u>504.3(5) – Ramps (Single-Lane Ramps)</u>  <i>When additional lanes are provided near an entrance ramp intersection, the lane drop should be accomplished over a distance equal to WV.</i></p> <ul style="list-style-type: none"> <li>• NB Entrance Ramp</li> <li>• SB Direct Entrance Ramp (Alt 3 only)</li> </ul>	High	<p>The existing lane drop on the NB Entrance Ramp is approximately 230 feet, or roughly 19:1. This portion of the ramp will not be modified as part of this project.</p> <p>In Alternative 3, the SB Loop Entrance Ramp would be removed and the SB Direct Entrance Ramp would be widened to 3 lanes at the terminus. Given the length of the ramp, the longest taper possible would be 15:1, which would be less than a length of WV.</p> <p>Both ramps would meet Mandatory Standard 504.3(1)(d) and 504.3(2)(b), which requires a minimum 15:1 taper.</p>
2, 3, 4	<p><u>504.3(5) – Ramps (Single-Lane Ramps)</u></p> <p>If the length of a single lane ramp exceeds 1,000 feet, an additional lane should be provided on the ramp to permit passing maneuvers.</p> <ul style="list-style-type: none"> <li>• NB Exit Ramp</li> <li>• SB Direct Entrance Ramp (Alt 2 only)</li> <li>• SB Loop Exit Ramp (Alts 3, 4 only)</li> </ul>	Medium	<p>The existing single-lane NB Loop Exit Ramp is approximately 1,600 feet long. The proposed project would realign the terminus of the ramp as a perpendicular, controlled intersection but does not propose to add a lane to the ramp.</p> <p>The existing single-lane SB Direct Entrance Ramp is approximately 1,050 feet long. Alternative 2 would not modify this ramp.</p> <p>Alternatives 3 and 4 would separate the SB Loop Entrance and Exit Ramps, and eliminate the 2-lane C-D road between them. In the proposed condition, the single-lane SB Loop Exit Ramp would be approximately 2,000 feet long. The PST considered widening the downstream end of the ramp to two lanes; such a widening was not warranted by the forecast traffic volumes. Further consideration may be given during PA/ED.</p>



### **Sidewalk on South Side of Katella Avenue**

In an effort to reduce pedestrian conflicts with free-right turn movements, the PST considered eliminating sidewalk along eastbound Katella Avenue from the westerly project limits to Civic Center Drive. The PST studied the existing and proposed conditions, surrounding land uses, and planned improvements, and determined that eliminating sidewalk on the south side of Katella Avenue is recommended for the following reasons:

- No Plans for Future Sidewalk on South Side of Willow Street  
As noted in Section 5, Deficiencies, pedestrian facilities on both sides of Katella Avenue are discontinuous at the west end of the interchange. Beyond the interchange to Studebaker Road, there are no sidewalks on either side of Willow Street for approximately one mile, with the exception of sidewalk barriers on the bridges over Coyote Creek, an access road, San Gabriel River, and a golf course path. The City of Long Beach doesn't have existing plans to construct sidewalk on the south side of the roadway along that portion of Willow Street. Land uses to the south side of Willow Street include El Dorado Park and Golf Course and a Los Angeles County Sanitation facility. Both the golf course and sanitation facility are fenced, with no pedestrian access for approximately 3,400 feet.
- Future Facilities on North Side of Willow Street  
On the north side of Willow Street, land uses between the interchange and Studebaker Road include El Dorado Park West and El Dorado Nature Center Park. As noted in Section 6, the City of Long Beach is currently developing a project to provide a Class I trail on the north side of Willow Street from Studebaker Road to the San Gabriel River. There are no known plans for a sidewalk to continue from the San Gabriel River to Coyote Creek; however, given the attractions on the north side of Willow Street and the lack of pedestrian-accessibility along a long stretch on the south side of Willow Street, the PST anticipates that the likelihood of a sidewalk connection is considerably higher on the north side of the road than on the south side.
- Free Right Turn Movements at Ramp Termini on Eastbound Katella Avenue  
In the existing condition, the three I-605 ramps that join eastbound Katella Avenue have free-right turn movements at their termini. Through the focus area analysis and alternatives development, modifications to these ramp termini to provide perpendicular, signal controlled intersections were studied and rejected due to impacts to traffic operations. As a result, the three proposed build alternatives include free-right turn movements at the ramp termini, similar to existing conditions.

Based on the above information, the PST and Caltrans concluded that pedestrian travel on Katella Avenue through the interchange would be better served on the north side of the roadway, where there would be fewer conflicts with free-right turn movements and better connectivity with facilities to the west. Pedestrians traveling west on the south side of the roadway would ultimately reach a dead end at the west end of the interchange, with no street crossing available. As such, the PST proposed to eliminate the sidewalk on the south side of Katella Avenue west of

Civic Center Drive. Pedestrians traveling west on the south side of Katella Avenue would cross to the north side at Civic Center, and continue through the interchange.

On May 16, 2014, members of the PST met with the District 12 ADA coordinator in the field to review existing conditions and discuss future planned improvements. The ADA coordinator was supportive of the concept of removing the sidewalk from the south side of the interchange. On June 18, 2014, the Caltrans Headquarters Division of Design ADA Design Reviewer provided comments indicating that, due to concerns regarding connectivity, sidewalk should be provided on the south side of Katella Avenue throughout the project in Alternatives 2 and 4. For Alternative 3, because a crossing would be provided at the new signal at the southbound ramps, sidewalk may be eliminated on the south side of Katella Avenue between the southbound ramps intersection and Civic Center Drive.

Based on direction from the Headquarters ADA Design Reviewer noted above, all three alternatives would provide sidewalk along the north side of Katella Avenue throughout the project limits, Alternatives 2 and 4 would provide sidewalk on the south side of Katella Avenue throughout the project limits, and Alternative 3 would provide sidewalk along the south side of Katella Avenue from the westerly project limit to the proposed southbound entrance ramp intersection. Existing sidewalk on the south side of Katella Avenue, from the southbound ramps to Civic Center Drive, would be removed in Alternative 3; however, the proposed roadway design would provide adequate parkway width behind the curb and would not preclude construction of a sidewalk in the future, if deemed appropriate. Local bicycle and pedestrian communities will be provided an opportunity to comment on the proposed improvements during the PA/ED phase.

## **7.6 Common Features for Alternatives**

### Project Alternative Refinements

The PST has noted that the results of the traffic analyses are, in some locations, inconsistent with observed conditions in the field (e.g. observed congestion on SR-605 southbound C-D road and eastbound Katella Avenue). The inconsistencies principally stem from the preliminary scope of the traffic analyses for this phase of project development. During the PA/ED phase, more detailed traffic analyses will be performed with new traffic counts and the latest forecasting models. Based on those traffic results, a more detailed understanding of the necessary geometries, lane configurations, interactions between intersections, and storage lengths will be developed. Further refinements of the project alternatives will be considered at that time and could include longer turn pockets, increased ramp storage, and modified lane configurations. Limiting right of way impacts will be a particularly sensitive element of any alternative refinements being evaluated.

Specific areas for potential alternative refinements include:

- Eastbound Katella Avenue at the northbound ramp intersection: If additional left turn storage is needed for the northbound entrance ramp turn pocket, additional widening of Katella Avenue may be evaluated. Consideration may also be given to removing the morning peak hour HOV restriction on that left turn movement.

- Westbound Katella Avenue at the northbound ramp intersection: Operation of the northbound ramp intersection will be reviewed to confirm that the conversion of the westbound dual free right turn lanes to a single signal-controlled lane is viable.
- Westbound Katella Avenue through interchange (Alt 3): Modification of the proposed through and left turn lane configurations will be evaluated relative to optimal lane drop locations and left turn lane storage.
- Southbound entrance ramp (Alt 3): The location of the ramp metering stop bar may be moved further downstream to provide additional queuing storage length.
- Southbound entrance ramp (Alts 2 and 3): Verify the number of lanes required at the ramp meter.

### Transportation Management Plan

A Transportation Management Plan (TMP) will be prepared to reduce potential construction-related traffic conflicts, detours, and delays. TMP data sheets will be developed during the PA/ED phase in order to recommend methods of reducing construction and circulation impacts.

### Construction Staging

It is anticipated that the project will be staged to minimize impacts to existing traffic. Modifications are proposed to the northbound I-605 ramps in all three build alternatives. Alternative 4 would completely reconstruct the three southbound I-605 ramps and construct two new bridges. Staging design will be considered during further development of the alternatives in PA/ED. Detailed staging plans and traffic handling plans will be developed in the final design phase.

### Storm Water BMPs

A Project Initiation Document (PID) phase Storm Water Data Report (SWDR) has been prepared to identify potential storm water quality issues and permanent Best Management Practices (BMPs). The SWDR will be updated during the PA/ED and PS&E phases. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared for this project during PS&E to address construction BMPs. It is anticipated that post-project State right of way will provide adequate area for BMPs. This will be confirmed during the PA/ED and PS&E phases. The downstream receiving water body for the project is the Coyote Creek, which drains to the San Gabriel River Reach 1, the San Gabriel River Estuary, and then the Pacific Ocean. Multiple pollutants have been identified on the 2010 303(d) list for the receiving water bodies. A Total Maximum Daily Load (TMDL) has been established for metals and selenium in the San Gabriel River and Impaired Tributaries, which include Coyote Creek. The anticipated storm water project risk level is Level 1 for Alternative 2 and Level 2 for Alternatives 3 and 4.

### Drainage

#### Regional Existing Systems

Three regional systems are within the project vicinity. Two facilities are owned and maintained by Orange County Public Works (OCPW). The third system is maintained by Los Angeles County Department of Public Works (LACDPW) but is owned in fee by the U.S. Army Corps of

Engineers (ACOE). In June 2014, OCPW and LACDPW were contacted to confirm facility ownership and discuss potential impacts.

#### *OCPW Systems*

- Los Alamitos Drainage Channel (OCPW Facility Number C01) is an open channel/box culvert drainage system. The C01 facility passes under Katella Avenue in a 10-ft x 5-ft reinforced concrete box (RCB) (SxH). Under I-605, the C-01 facility is in a 10-ft x 7-ft RCB. Between these locations, C01 is a trapezoidal earthen channel with a base width of 7.5-ft, a top width of 34.5-ft, and side slopes at 1.5:1. Record flow rates shown on the 1966 construction drawings indicate a flow rate of 185 cfs.
- Katella Storm Drain (OCPW Facility Number C01S05) is primarily an RCB storm drain system. At the confluence with C01, the Katella Storm Drain is in a rectangular channel for 98.5 linear feet. Beneath the existing southbound I-605 ramps the channel is enclosed in a 12-ft x 8-ft RCB. Through the southbound I-605 loop exit ramp, the channel is a concrete lined trapezoidal channel with a 4.5-ft base width, 9-ft of depth, and 1.5:1 side slopes. The invert is depressed 6 inches, for a total depth of 9.5-ft. Under the I-605 and within Katella Avenue to the eastern side of the northbound exit ramp, the channel is a 12-ft x 8-ft RCB. This portion of C01S05 was constructed in 1963 and no flow rates are indicated on the record drawings. Along Katella Avenue, east of Caltrans right of way, the channel is within OCPW right of way. This portion of the channel is a 10-ft x 8-ft RCB within a 45-ft right of way. The RCB has a nominal cover of 2.5 to 3 feet. This reach of RCB was constructed in 1977 to replace an existing open channel. The C01S05-409-2 plan set indicates a 25-yr HGL at an approximate depth of 7-ft. There are no existing flow rates or other hydraulic parameters shown.

#### *ACOE System*

- LACDPW-maintained Coyote Creek is a concrete lined trapezoidal channel with a low-flow channel invert. The roadway improvements are anticipated to extend toward the East Willow Street Bridge over Coyote Creek within the Coyote Creek right of way. The project does not propose improvements that would affect the Coyote Creek facility or ACOE jurisdiction; however, in the event impacts to this drainage channel become necessary, a Federal permit through the ACOE and associated National Environmental Policy Act (NEPA) clearance would be required.

#### *Local Existing Systems*

Existing local systems are either City of Los Alamitos or Caltrans owned and maintained. The City of Los Alamitos systems appear to include catch basins on either side of Katella Avenue just west of Civic Center Drive and a pair of catch basins on Oak Street on the north side of Katella Avenue.

The Caltrans systems consist of drop inlets, overside drains, and drainage ditches throughout the interchange. The median drainage system on I-605 provides drainage for the superelevated portion of I-605 mainline through the interchange. This system outlets in the southbound loop exit ramp to a concrete ditch which then connects to the open channel portion of C01S05 that crosses this infield. A unique feature of the existing local system is the drainage at the north east corner of the interchange. The site at 3131 Katella Avenue (currently occupied by Super Media) appears to drain into Katella Avenue via a ribbon gutter and then is intercepted by a sidewalk

culvert near the northbound I-605 entrance ramp. The sidewalk culvert feeds into a Caltrans v-ditch at the toe of the slope. At the southwest corner of the property, a second overside drain is also connected to this v-ditch in the vicinity of the cross walk, adjacent to the Caltrans overside drain on the northbound I-605 entrance ramp. The v-ditch continues northward along the toe of the ramp to confluence with C01 just upstream of the I-605 box culvert.

### Proposed Regional Systems

Due to the age of the existing regional systems, the design predates the October 1986 OCPW Hydrology Manual and the OCPW Flood Control Design Manual Addendum 3 (January 28, 1988). Discussion with OCPW in June 2014 confirmed that, within OCPW right of way, OCPW will require updated regional hydrology, channel hydraulic analysis, and channel improvements to bring the existing systems into compliance with current design standards in any area where the proposed roadway improvements would preclude OCPW from constructing improvements. An OCPW Encroachment Permit will be required for work of this nature. Without detailed regional hydrology, but based on the construction date, it is estimated that the existing drainage systems are approximately fifty percent adequate for current land uses, runoff rates, and freeboard requirements. For cost purposes, additional improvements are estimated to consist of a second barrel on all RCBs constructed adjacent to the existing RCB. The Alternative 4 southbound loop entrance ramp will require relocation of C01S05 across the southbound loop exit ramp infield. Locations of the piers, abutments, and bridge approach are anticipated to affect the existing trapezoidal channel.

### Proposed Local Systems

Local systems in the City of Los Alamitos are expected to consist of relocations of existing catch basins on Katella Avenue near Civic Center Drive. The Caltrans drainage systems are expected to include additional overside drains and improvements to accommodate permanent water quality BMPs in the infields. It is anticipated that Caltrans will not accept the existing flow from Katella Avenue and the private parcel on the NE corner of the interchange, due to water quality and liability concerns. A new cross drainage system to connect these areas to C01S05 is expected to be considered as the project moves forward.

### Engineering Technical Reports

The following engineering technical reports are anticipated for Alternatives 2, 3, and 4 during the PA/ED phase of the project:

- Advanced Planning Studies for the Katella Ave Overcrossing and SB Loop Exit Ramp Overcrossing (Alt 4 only)
- Preliminary Drainage Reports to address existing and proposed hydrology and hydraulic designs
- Preliminary materials and geotechnical design reports
- Life-Cycle Cost Analysis for pavement design
- Storm Water Data Report (update to PA/ED level)
- Right of Way Data Sheets
- Traffic Forecasting and Methodology
- Traffic Analyses (see Section 4. Traffic Engineering Performance Assessment)
- Traffic Management Plan Data Sheets

## Permits

The proposed build alternatives would likely require the following permits and approvals:

- National Pollutant Discharge Elimination System (NPDES) Construction General Permit
- Caltrans Statewide NPDES Permit
- Caltrans District 12 Encroachment Permit
- City of Los Alamitos Encroachment Permit
- Los Angeles County Flood Control District Encroachment Permit
- Orange County Flood Division Encroachment Permit

Though it is not expected that impacts to jurisdictional waters of the U.S. and State would occur, additional investigation would be required during PA/ED to confirm this finding and determine whether permits from the U.S. Army Corps of Engineers (ACOE), State Water Resources Control Board (SWRCB), and California Department of Fish and Wildlife (CDFW) would be required.

### **7.7 Improvements Considered but Not Moving Forward**

This section provides a summary of the design improvements that have been considered during project development but are not recommended for advancement to the PA/ED phase.

#### Roundabouts and Diverging Diamond Intersections

Caltrans District Traffic Operations Policy Directive 13-02: Intersection Control Evaluation (ICE) requires the consideration of various strategies, treatments, and configurations at state highway intersections to balance the needs of all modes and users with system performance goals and the highway facility context. To address the ICE requirements, the PST assessed the viability of two potential intersection configurations, a roundabout and a diverging diamond interchange (DDI). Roundabouts were evaluated at the northbound and southbound ramp intersections at Katella Avenue. A DDI would require a major reconfiguration of Katella Avenue and the ramp termini. An assessment was made of both alternatives and documented in a memorandum to the PST, with a recommendation that both intersection alternatives should be removed from further consideration due to the following factors:

- Significant right of way acquisition;
- Significant increase in project cost for right of way acquisition, which would exceed the funding constraints of the M2 budget for this project;
- Right of way acquisition would potentially generate project controversy;
- Negligible operational benefit;
- Significant congestion through construction staging; and
- Inconsistent with the project Purpose and Need.

The ICE memorandum received concurrence from Caltrans' ICE Coordinator on July 16, 2014, and is included as Attachment E.

### Northbound Exit Ramp Terminus Modification as a Controlled Intersection

The existing northbound direct exit ramp terminus is a free-right turn movement to eastbound Katella Avenue. During the focus area evaluation, the PST considered reconfiguring the terminus with a perpendicular, signal-controlled intersection. During the workshop meeting with Caltrans functional units, Traffic Operations noted concerns that a signal at the intersection would not be visible to eastbound Katella Avenue traffic due to the sag curve under the bridges over Katella Avenue. Traffic Operations, therefore, did not support this configuration. As a result, a perpendicular, signal-controlled configuration of the northbound direct exit ramp terminus was not carried forward as part of the project alternatives.

### Westbound Katella Avenue Free-Right Movement to Northbound Entrance Ramp

The existing northbound entrance ramp terminus has a dual-lane free-right turn movement from westbound Katella Avenue and a single-lane perpendicular entrance from eastbound Katella Avenue. During the focus area evaluation, the PST considered maintaining a free-right turn movement, but as a single lane. This was considered an improvement to the existing condition, as it would eliminate the existing short merge between the two entrance movements. However, upon further discussion, a perpendicular, signal-controlled intersection was preferred due to improved conditions for pedestrians and bicyclists. Consequently, the free-right turn movement at the northbound entrance ramp was not carried forward as part of the project alternatives.

## **8. RIGHT OF WAY**

### **Right of Way**

Below is a summary of the estimated right of way to be required for each project alternative. Attachment F provides the Conceptual Cost Estimate - Right of Way Component.

Alternative 1 (No Build): No parcels are required.

Alternatives 2, 3, and 4: The three build alternatives are anticipated to require approximately 0.04 acres of right of way on the north side of Katella Avenue. On the south side of Katella Avenue, improvements would be located within an existing OC Flood easement. While it is expected that an agreement would be needed between the County and the City of Los Alamitos to address physical improvements and long term maintenance, no formal right of way acquisition is anticipated. Encroachment permits would be needed from Orange County and Los Angeles County Flood Control agencies for temporary construction activities within their parcels adjacent to the interchange.

### **Utilities**

Utility research was initiated via the Dig Alert website to establish a list of potential utility companies in and around the project area. Those identified companies were contacted for verification and facility maps. Additional utility data was obtained from available City and County as-built plans. The following utilities have confirmed that they have facilities within or immediately adjacent to the project site:

<u>Utility</u>	<u>Owner</u>
Cable	Time Warner Cable
Electrical	Southern California Edison Clear Channel Outdoor
Gas	Southern California Gas Long Beach Gas and Oil
Oil	Plains All American Pipeline
Sewer	Rossmoor / Los Alamitos Sewer District
Water	Golden State Water
Wireless	Verizon Wireless

Approximate locations of the above utilities are shown schematically on Attachment G, Existing Utilities. Coordination with the identified utility companies will be carried out during the PA/ED, PS&E, and construction phases. Anticipated impacts include relocations of water appurtenances on the north side of Katella Avenue and minor adjustments to grade of manholes and pull boxes. Existing overhead power lines are located on both sides of the interchange and along eastbound Katella Avenue east of the interchange. They will be protected in place. Extents of utility impacts, appropriate measures, and potential costs will be evaluated further during the PA/ED phase.

### **Railroad**

There are no railroad facilities within the project limits.

## **9. STAKEHOLDER INVOLVEMENT**

The PST for the PSR-PDS phase of this project included OCTA as the project sponsor, the City of Los Alamitos, and Caltrans. The PST jointly defined the scope of this project, established the purpose and need, and developed the project alternatives. While not participants in the PST, the County of Orange, Gateway Cities Council of Governments, Los Angeles County Metropolitan Transportation Authority, and the City of Long Beach have received regular project updates through the distribution of meeting minutes.

The draft environmental documents prepared for this project will be publicly noticed and circulated as applicable. A series of public workshops and/or potential interviews with stakeholders and property owners are anticipated to gain input prior to completion of the draft environmental document to ensure the project is consistent with the aesthetic, historical, and environmental values of the community.

## **10. ENVIRONMENTAL DETERMINATION/DOCUMENTATION**

A Preliminary Environmental Analysis Report (PEAR) has been prepared for this project, and is attached herewith as Attachment H. The PEAR has been developed to comply with both CEQA and NEPA. Based on the preliminary evaluation conducted as part of the PEAR, the anticipated environmental document for this project is an Initial Study/ Environmental Assessment (IS/EA) leading to a Mitigated Negative Declaration (MND) under CEQA, and Finding of No Significant Impacts (FONSI) for NEPA.



Caltrans will be the lead agency under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) (under the NEPA authority assigned to Caltrans by the US Department of Transportation in Memorandum of Understanding 23 USC 326 and 23 USC 327 [effective October 1, 2012]).

Based on the technical summaries described in the PEAR, it is expected that impacts associated with all build alternatives would be mitigated to a level below significance.

Several technical studies are required for this proposed project. It is not anticipated that the individual resource evaluations will identify significant environmental concerns within or adjacent to the proposed project area that cannot be mitigated. If additional technical studies are necessary, the completion of these studies could affect schedule and cost. Construction monitoring for biological and cultural resources, if deemed necessary, could also complicate, slow, or lengthen the schedule and increase costs.

It should be noted that due to the project's potential to affect roadway capacity and truck volumes, it may be determined to be a Project of Air Quality Concern (POAQC) by the Transportation Conformity Working Group (TCWG). However, interagency consultation with the TCWG would be required for a formal determination as part of the PA/ED phase.

The following is a list of the anticipated environmental and engineering technical studies identified in the PEAR:

- Archaeological Survey Report (ASR)
- Historic Property Survey Report (HPSR)
- Water Quality Technical Memorandum (WQTM) or Water Quality Assessment Report (WQAR)
- Geotechnical Design Report
- Paleontological Identification and Evaluation Report (PIR/PER)
- Initial Site Assessment (ISA)
- Aerially Deposited Lead (ADL) Report
- Air Quality Assessment Report (AQAR)
- Air Quality Conformity Report
- Transportation Air Quality Conformity Checklist
- Noise Study Report
- Natural Environment Study – Minimal Impact (NES-MI)

## **11. FUNDING**

### **Capital Outlay Project Estimate**

This project was identified in the Measure M2 Freeway Program as Project M. It is a candidate for programming PA/ED capital outlay support in the STIP. After approval of the PSR/PDS document, OCTA will seek STIP funding to support the PA/ED phase. STIP, federal, and other potential funding sources may be sought by OCTA to support the plan, specifications, and engineering and the capital construction costs. These funding sources will be identified and explored further during the PA/ED phase.

Table 11.1 summarizes the Capital Outlay Project Estimates (Attachment I). The construction and right of way costs are presented in today's dollars, with no escalation.

**Table 11.1 – Capital Outlay Project Estimate**

Alternative	Range of Estimate	
	Construction	Right of Way
Alternative 2	\$6 M - \$8 M	\$300 K - \$500 K
Alternative 3	\$9 M - \$11 M	\$300 K - \$500 K
Alternative 4	\$16 M - \$18 M	\$300 K - \$500 K

The level of detail available to develop these capital outlay project estimates is only accurate to within the above ranges and is 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. The Project Report will serve as the appropriate document from which the remaining support and capital components of the project will be programmed.

#### **Capital Outlay Support Estimate**

The capital outlay support estimate for programming PA/ED for this project is \$250,000 to \$1.0 million.

## **12. SCHEDULE**

Project milestones for PA/ED are shown in Table 12.1. The target for starting the PA/ED phase is mid-2016. The PA/ED phase duration is 24 months, with completion in June of 2018. The assumed funding fiscal year for construction is 2029/30.

**Table 12.1 – Project Milestones**

Project Milestones		Scheduled Delivery Date
Program project	M015	April 2015
Begin environmental	M020	July 2016
Circulate draft project report and draft environmental document externally	M120	November 2017
PA/ED complete	M200	June 2018

## **13. RISKS**

The Project Risk Management Team has prepared a risk register that identifies risks to carry forward to the PA/ED phase. Thirty potential risks were identified, all threats. While probability

and impact varies with each one, these risks require close attention throughout the project. These risks should be monitored and updated during the PA/ED phase. Based on additional information gained at that time, risks may be avoided through design refinements, accepted and managed, or transferred to other parties. See Attachment J for the Risk Register.

#### **14. FHWA COORDINATION**

The proposed project is located on the Interstate Highway System, may have federal funding, and may have mandatory design exceptions. Additionally, Alternatives 3 and 4 would include modifications to freeway access. Depending upon which alternatives move forward to PA/ED, this project may be subject to Federal Highway Administration (FHWA) review; however, the process to request FHWA approval is deferred to the PA/ED phase.

In the event that the alternatives selected include modified access, an unsigned Draft Project Report must be submitted to FHWA to obtain an “engineering and operational acceptability” determination early in the PA/ED phase, prior to circulation of the draft environmental document. FHWA “approval” will be given after the NEPA process is completed and will require funding approval and an action approval. Action approval will be for both the access modification and design exceptions related to the thirteen controlling criteria identified by FHWA.

**15. PROJECT CONTACTS**

**CALTRANS DISTRICT 12**

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Project Manager

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Branch Chief, Advance Planning – Project Studies

**ORANGE COUNTY TRANSPORTATION AUTHORITY  
(SPONSOR AGENCY)**

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Project Manager

**CITY OF LOS ALAMITOS**

Dave Hunt .....(562) 431-3538  
Senior Engineer

**RBF CONSULTING**

Bo Burick .....(949) 855-5733  
Project Manager

Trisha Keith .....(949) 855-7049  
Project Engineer

Alan Ashimine .....(949) 855-5710  
Environmental Studies

**16. PROJECT REVIEWS**

Field Review _____	Date _____
District Maintenance _____	Date _____
District Traffic Safety Engineer _____	Date _____
District Safety Review _____	Date _____
HQ Design Coordinator _____	Date _____
Project Manager _____	Date _____
Constructability Review _____	Date _____
Other _____	Date _____

## **17. ATTACHMENTS**

A – Regional Vicinity Map

B – Typical Cross Sections

C – Project Alternatives Plans

    C-1 – Alternative 1 Plan

    C-2 – Alternative 2 Plan

    C-3 – Alternative 3 Plan

    C-4 – Alternative 4 Plan

    C-4A – Alternative 4 Southbound Ramps Profiles and Superelevation Diagrams

D – Design Exception Checklist

E – Intersection Control Evaluation Memorandum

F – Conceptual Cost Estimate – Right of Way Component

G – Utility Map

H – Preliminary Environmental Analysis Report (PEAR)

I – Capital Outlay Project Estimates

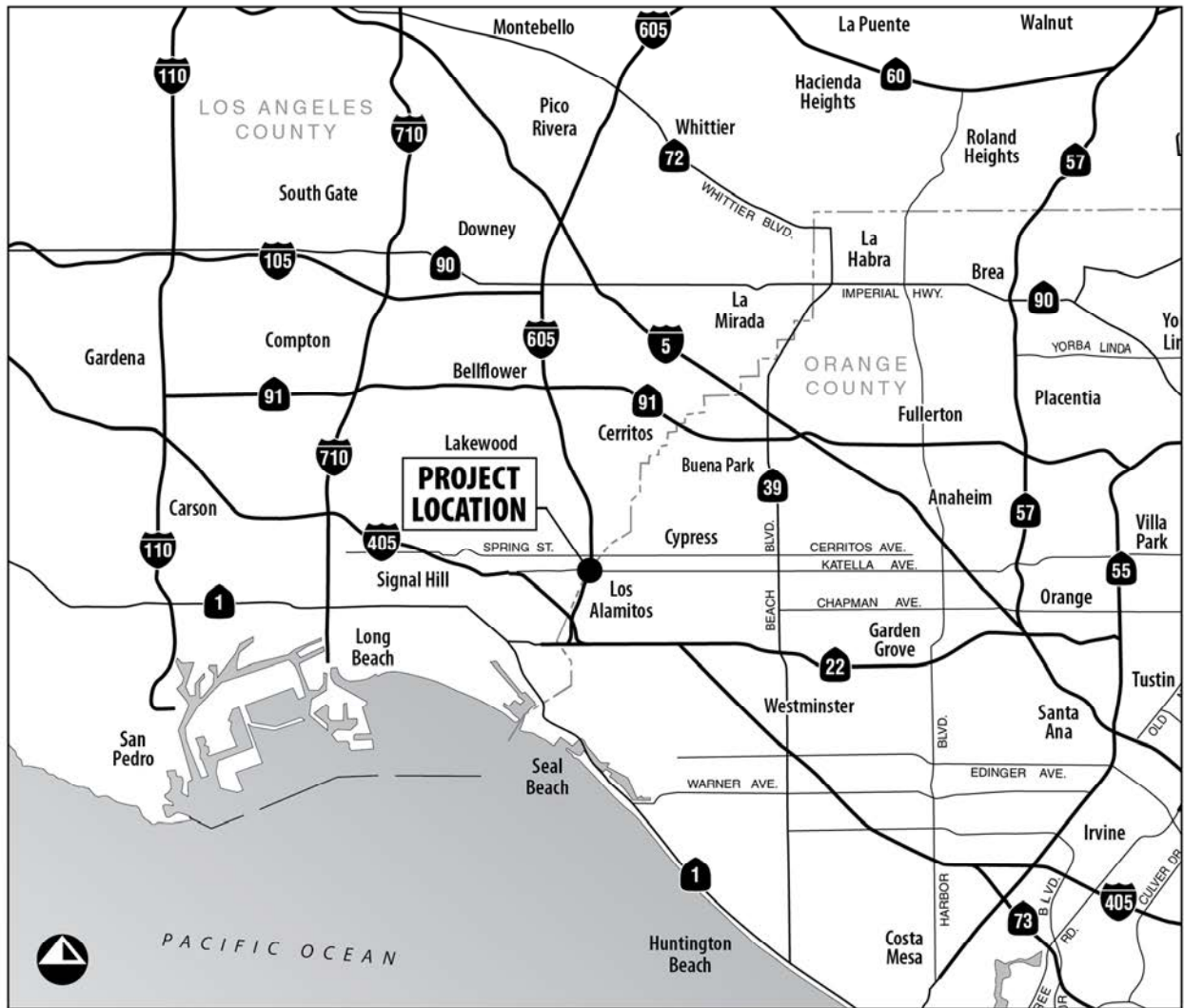
J – Risk Register

K – Transportation Planning Scoping Information Sheet

## **Regional Vicinity Map**

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Attachment A



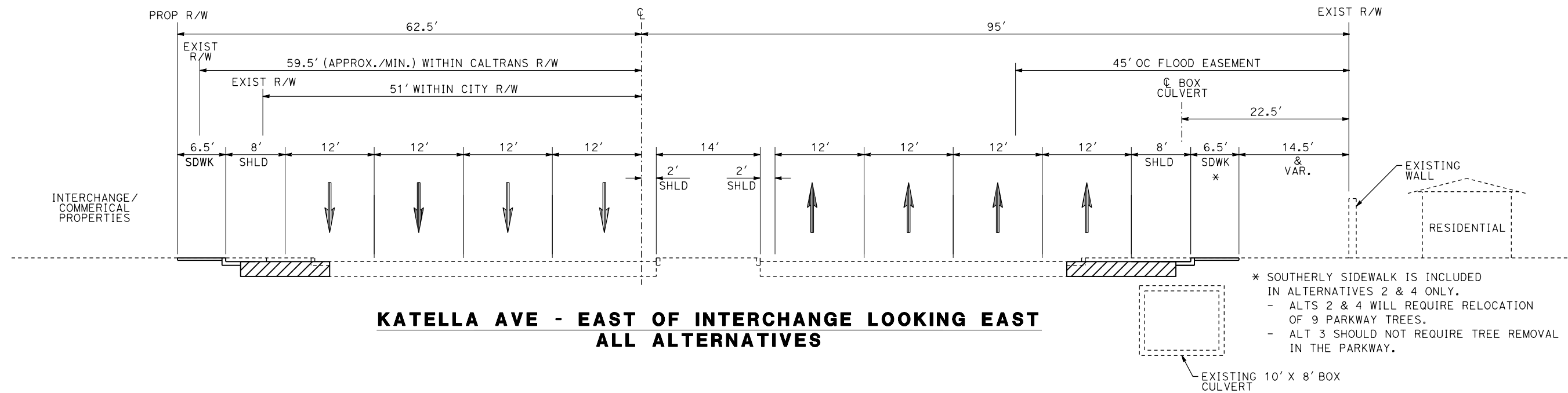
**Regional Vicinity Map**

## **Typical Cross Sections**

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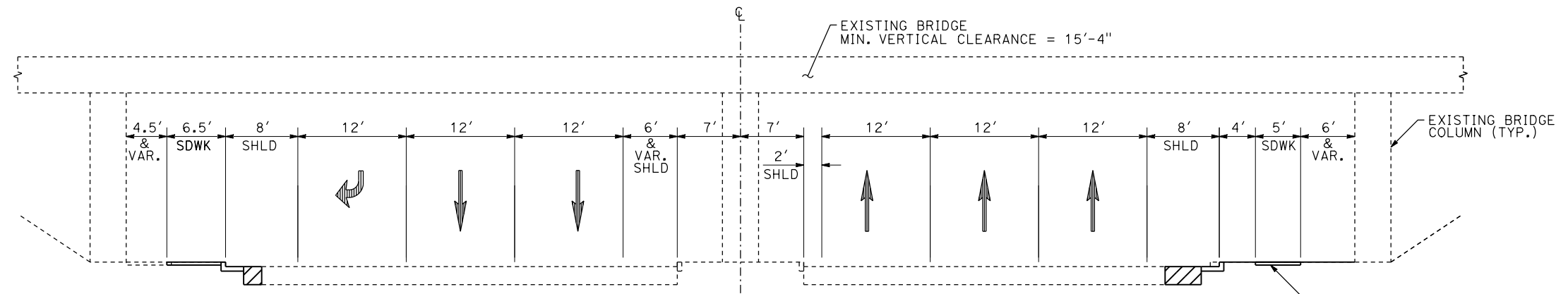
Attachment B



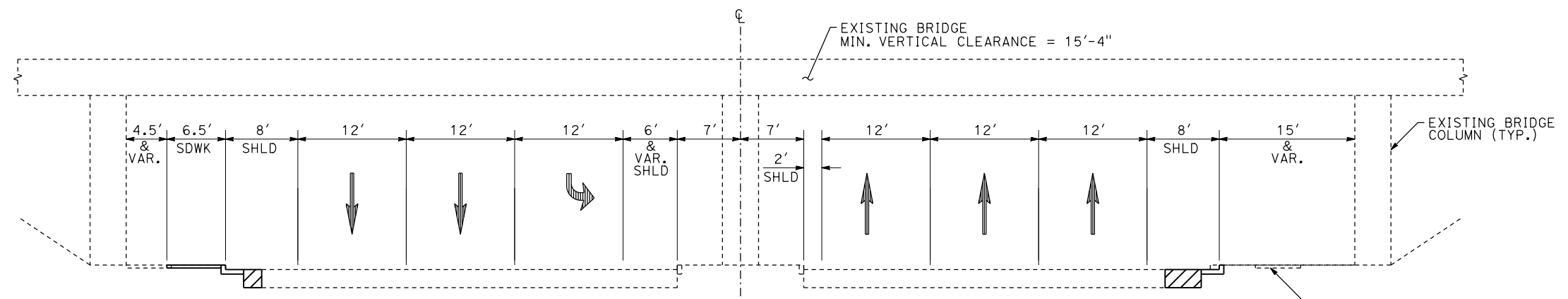


**KATELLA AVE - EAST OF INTERCHANGE LOOKING EAST  
ALL ALTERNATIVES**

\* SOUTHERLY SIDEWALK IS INCLUDED IN ALTERNATIVES 2 & 4 ONLY.  
- ALTS 2 & 4 WILL REQUIRE RELOCATION OF 9 PARKWAY TREES.  
- ALT 3 SHOULD NOT REQUIRE TREE REMOVAL IN THE PARKWAY.



**KATELLA AVE - AT I-605 CENTERLINE LOOKING EAST  
ALT 2 - NB RAMPS MODIFICATIONS  
ALT 4 - SB RAMPS BRAID**



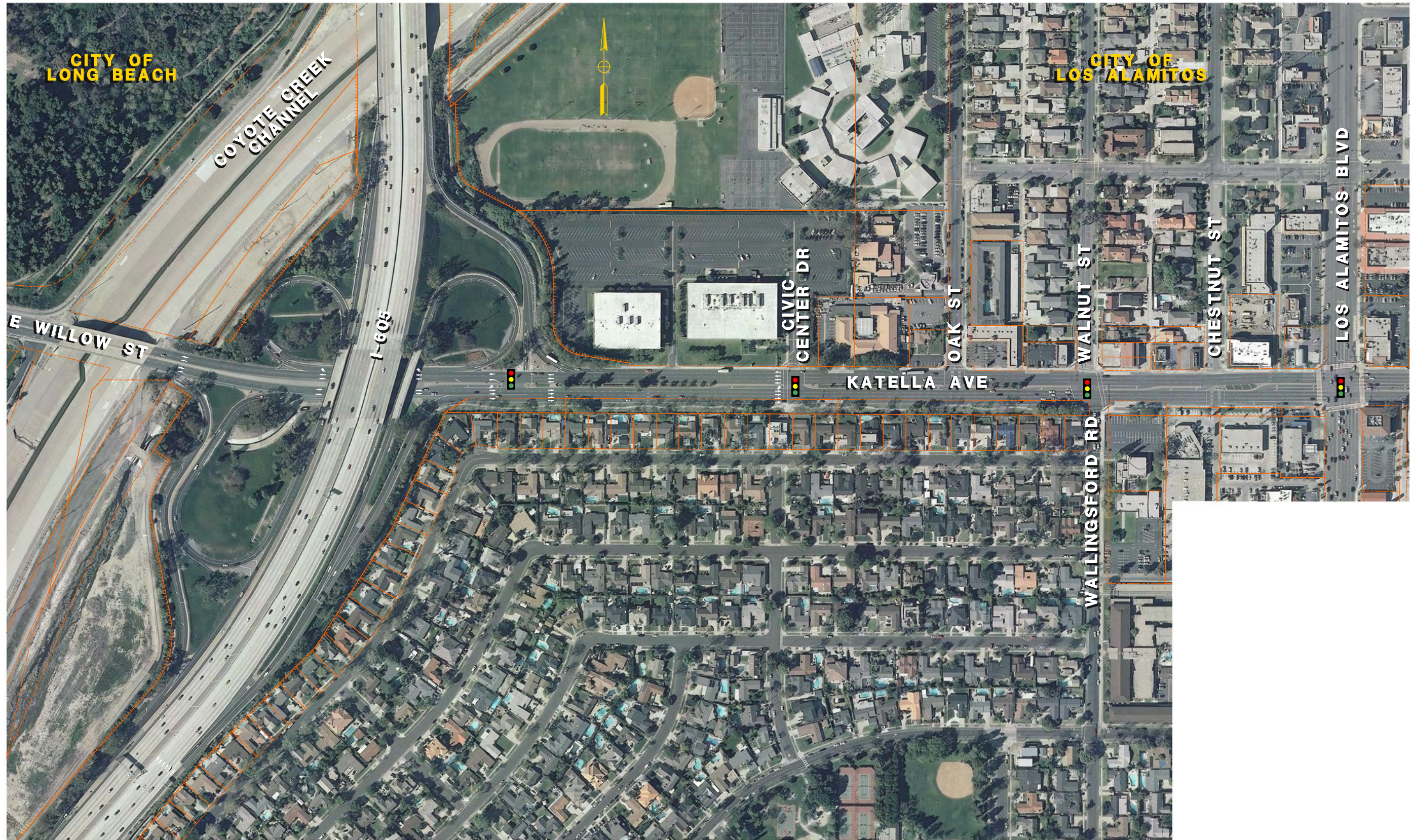
**KATELLA AVE - AT I-605 CENTERLINE LOOKING EAST  
ALT 3 - REMOVE SB LOOP ON RAMP**

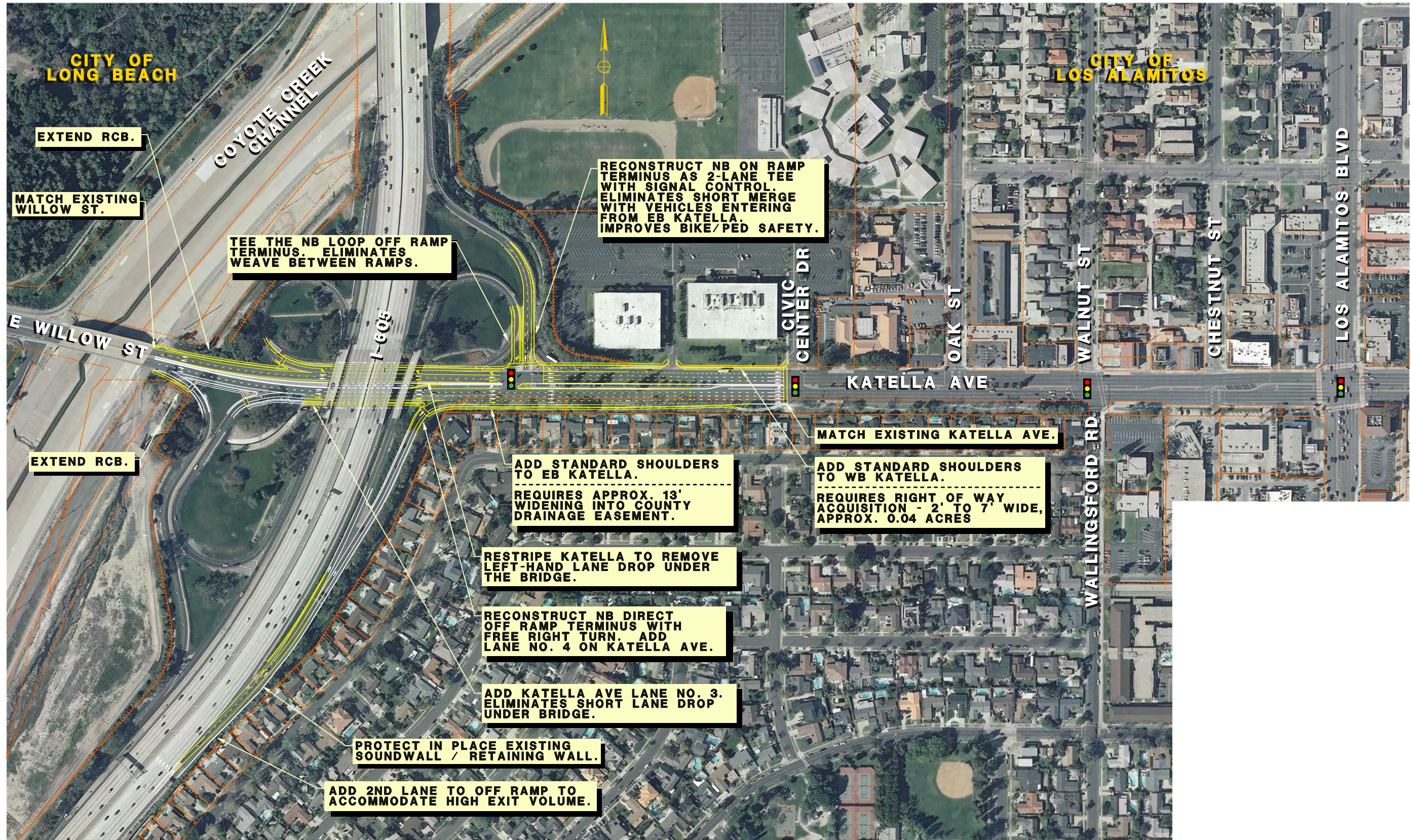
**LEGEND**  
 ROADWAY WIDENING

## **Project Alternatives Plans**

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Attachment C







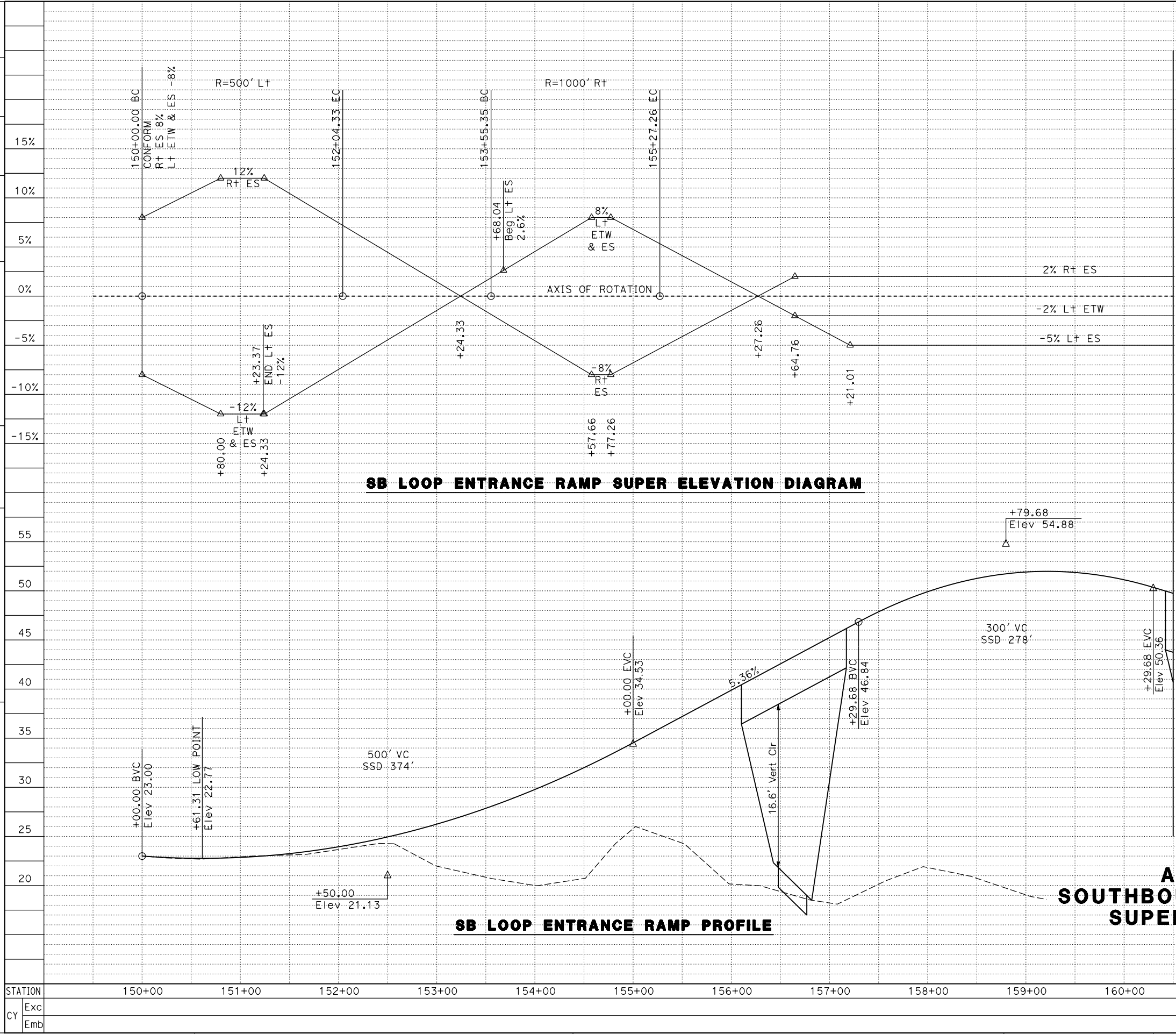


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12	Ora	605	XX-XX		5

REGISTERED CIVIL ENGINEER DATE \_\_\_\_\_  
 PLANS APPROVAL DATE \_\_\_\_\_  
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 DATE REVISED



MATCH LINE STA 160+50  
 SEE SHEET 2

**ATTACHMENT C-4A  
 SOUTHBOUND RAMPS PROFILE AND  
 SUPERELEVATION DIAGRAM**

SCALE: Horiz 1" = 50'  
 Vert 1" = 5'

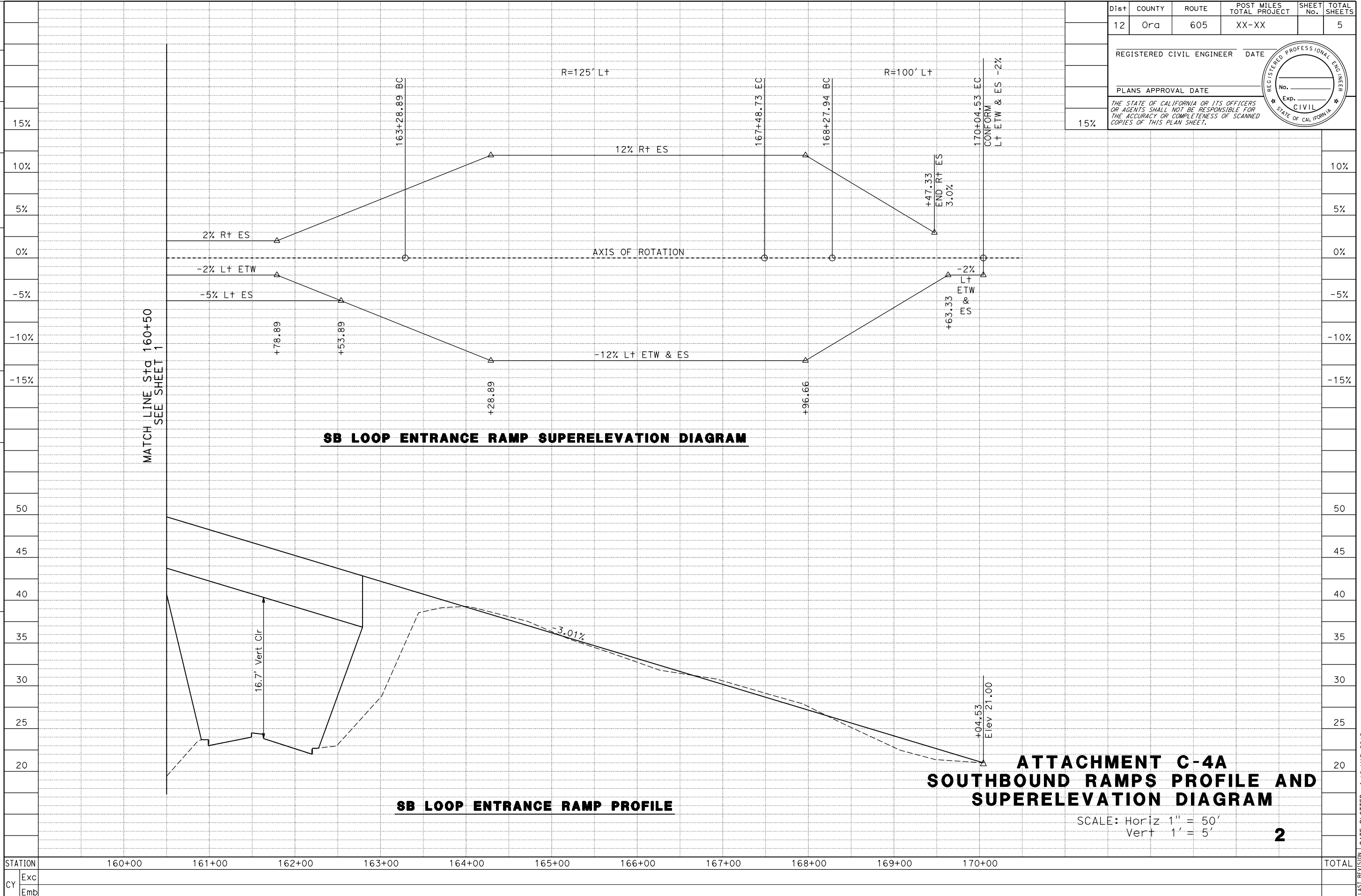
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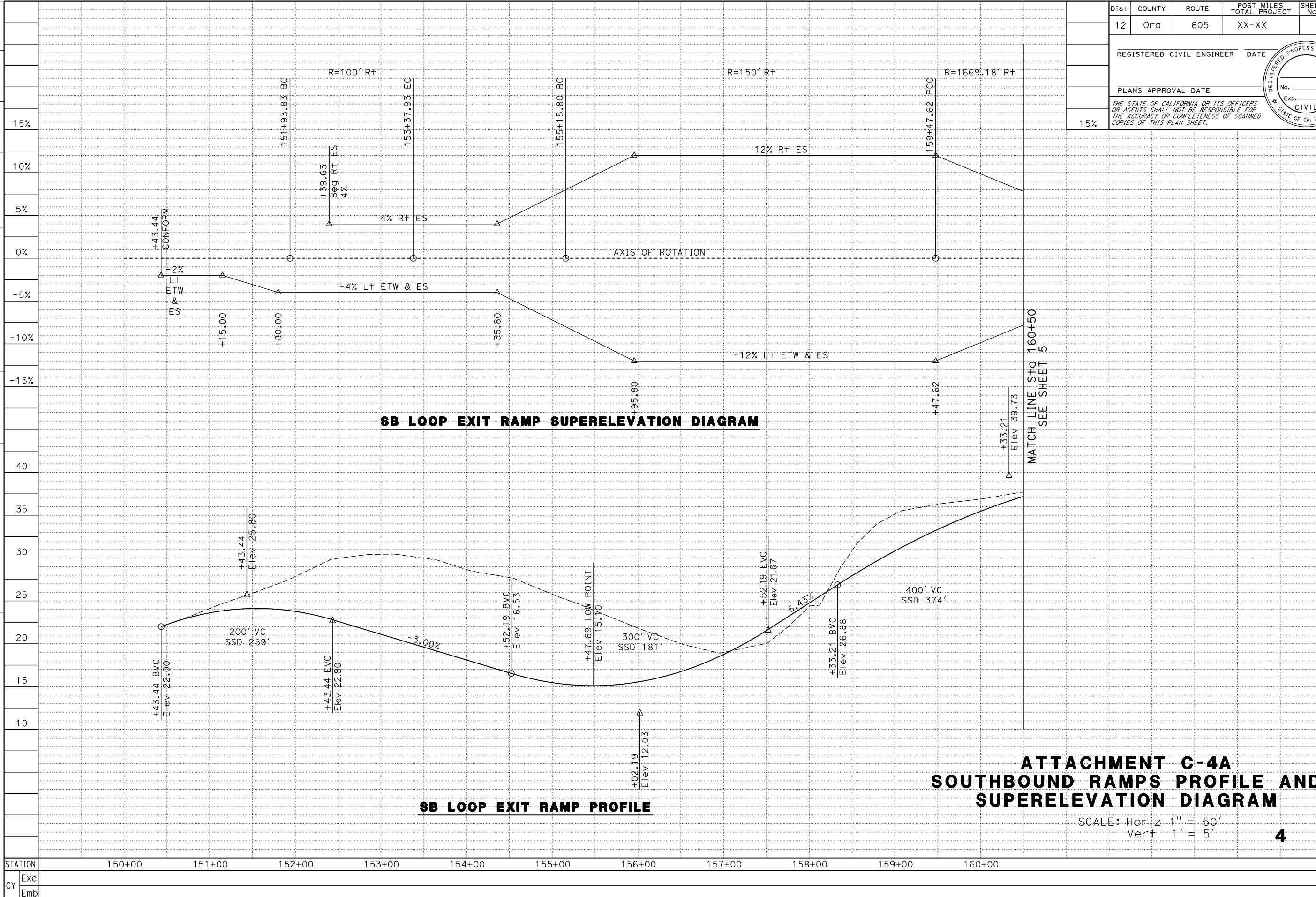
**ATTACHMENT C-4A  
 SOUTHBOUND RAMPS PROFILE AND  
 SUPERELEVATION DIAGRAM**

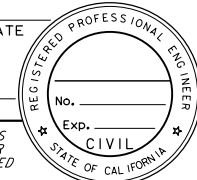
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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	605	XX-XX		5
REGISTERED CIVIL ENGINEER			DATE		
PLANS APPROVAL DATE					
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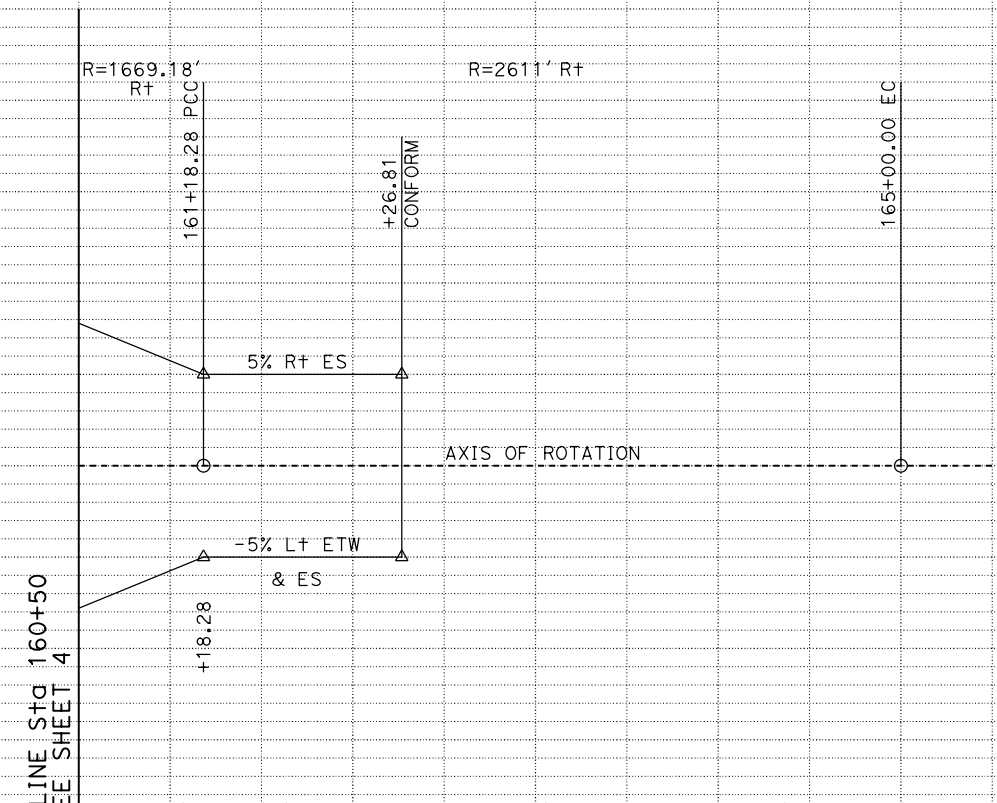
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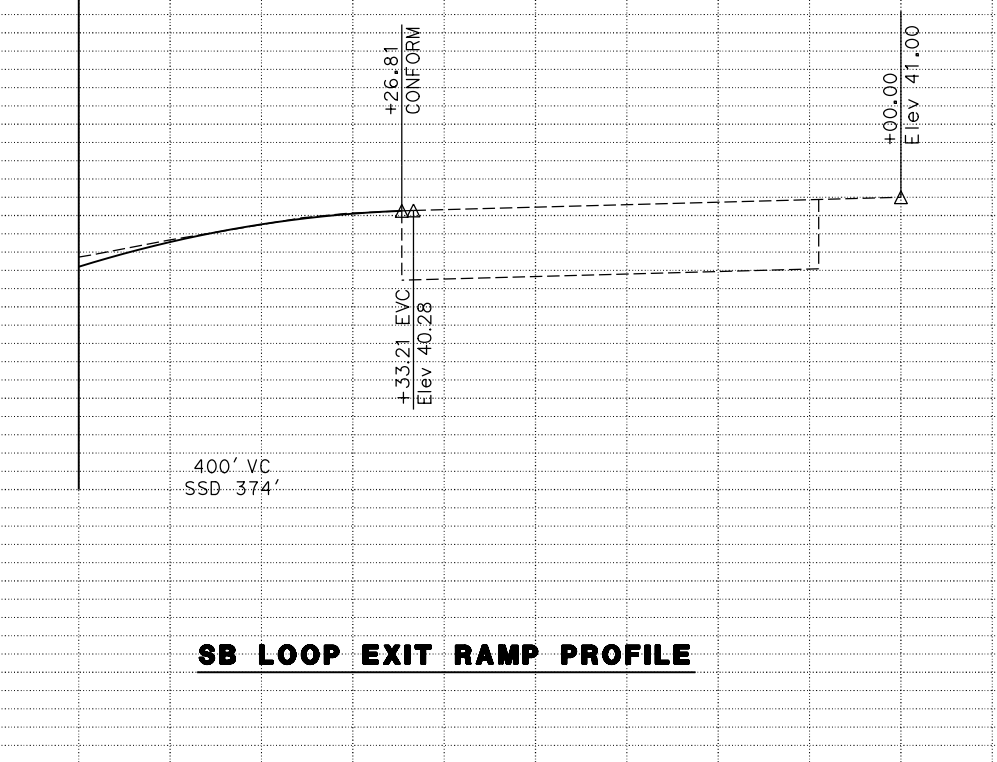
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**SB LOOP EXIT RAMP SUPERELEVATION DIAGRAM**



**SB LOOP EXIT RAMP PROFILE**

**ATTACHMENT C-4A  
 SOUTHBOUND RAMPS PROFILE AND  
 SUPERELEVATION DIAGRAM**

SCALE: Horiz 1" = 50'  
 Vert 1" = 5'

STATION	160+00	161+00	162+00	163+00	164+00	165+00	TOTAL
CY	Exc						
	Emb						

## **Design Exception Checklist**

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Attachment D

CALTRANS DESIGN EXCEPTION CHECKLIST (for HDM dated 11-2-12)

I-605/Katella Ave Interchange Improvements PSR-PDS

M = Meets Design Std.  
 V = Violates Design Std. (exception needed)  
 N/A = Not Applicable  
 U = Unknown (needs to be calc'd from topo)  
 TBD = To Be Determined during PAED

M or A	HDM Page #	HDM Index	HDM Index Heading	Design Standard	Katella Avenue				NB Exit Ramps				NB Entrance Ramp				SB Loop Entrance Ramp				SB Direct Entrance Ramp				SB Loop Exit Ramp / C-D Ramp			
					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4
M	100-1	101.1	Selection of Highway Design Speed	Local streets or roads within the State right of way, including facilities which will be relinquished after construction (such as frontage roads), shall have minimum design speeds conforming to AASHTO standards, as per the functional classification of the facility in question.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	100-1	101.1	Selection of Highway Design Speed	If the local agency having jurisdiction over the facility in question maintains design standards that exceed AASHTO standards, then the local agency standards should apply.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	100-2	101.1	Selection of Highway Design Speed	Where the local facility connects to a freeway or expressway (such as ramp terminal intersections), the design speed of the local facility shall be a minimum of 35 miles per hour.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	100-2	101.1	Selection of Highway Design Speed	However, the design speed should be 45 miles per hour when feasible.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	100-2	101.2	Highway Design Speed Standards	The following table (101.2) shows appropriate ranges of design speeds that shall be used for various conditions:	35	35	35	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	100-5	104.4	Protection of Access Rights	For proper control of acquired access rights, fencing or other approved barriers shall be installed on all controlled access highways except as provided in Index 701.2(3)(e).	M	TBD	TBD	TBD	M	TBD	TBD	TBD	M	TBD	TBD	TBD	M	TBD	TBD	TBD	M	TBD	TBD	TBD	M	TBD	TBD	TBD
A	100-5	104.5	Relation Access Opening to a Median Opening	Access openings should not be placed within 300 feet of a median opening unless the access opening is directly opposite the median opening.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	100-6	105.2	Sidewalks and Walkways	The minimum width of a sidewalk should be 8 feet between the curb and a building when in urban and rural main street place types. For all other locations the minimum width of sidewalk should be 6 feet when contiguous to a curb or 5 feet when separated by a planting strip.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	100-10	105.5	Guidelines for the Location and Design of Curb Ramps	On new construction, two curb ramps should be installed at each corner as shown on the Standard Plans.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	100-12	107.1	Roadway Connections	All connections to vista points, truck weighing or brake inspections stations, safety rest areas, park and ride lots, transit stations or any other connections used by the traveling public, should be constructed to standards commensurate with the standards established for the roadway to which they are connected.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	100-12	107.1	Roadway Connections	Only one means of exit and one means of entry to these installations should be allowed.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	200-1	201.1	General	Table 201.1 shows the minimum standards for stopping sight distance related to a design speed for motorists.	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
A	200-2	201.3	Stopping Sight Distance	The stopping sight distances in Table 201.1 should be increased by 20 percent on sustained downgrades steeper than 3 percent and longer than one mile.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-3	201.7	Decision Sight Distance	On freeways and expressways the decision sight distance values in Table 201.7 should be used at lane drops and at off-ramp noses to interchanges, branch connections, roadside rests, vista points, and inspection stations.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M
M	200-4	202.2(1)	Standards for Superelevation	Based on an e <sub>max</sub> selected by the designer for one of the conditions, superelevation rates from Table 202.2 shall be used within the given range of curve radii. If less than standard superelevation rates are approved (see index 82.1), Figure 202.2 shall be used to determine superelevation based on the curve radius and maximum comfortable speed.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	V	U	TBD	TBD	TBD	U	TBD	TBD	TBD
A	200-4	202.2(2)	Standards for Superelevation	On rural 2-lane roads, superelevation should be on the same plain for the full width of traveled way and shoulders, except on transitions (see Index 304.3 for cut widening conditions).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-4	202.2(2)	Standards for Superelevation	Bikeways. Table 202.2 also applies to Class II and III bikeways. See Index 103.1 for Class I guidance.	N/A	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-9	202.5(1)	Superelevation Transitions	A superelevation transition should be designed in accordance with the diagram and tabular data shown in Figure 202.5A to satisfy the requirements of safety, comfort and pleasing appearance.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	V	U	TBD	TBD	TBD	U	TBD	TBD	TBD

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M or A	HDM Page #	HDM Index	HDM Index Heading	Design Standard	Katella Avenue				NB Exit Ramps				NB Entrance Ramp				SB Loop Entrance Ramp				SB Direct Entrance Ramp				SB Loop Exit Ramp / C-D Ramp				
					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	
A	200-9	202.5(2)	Superelevation Transitions	Two-thirds of the superelevation runoff should be on the tangent and one-third within the curve.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	
A	200-12	202.5(3)	Superelevation Transitions	In such situations the highest possible superelevation rate(s) and transition length should be used, but the rate of change of cross slope should not exceed 6 percent per 100 feet.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	M	U	TBD	TBD	M	U	TBD	TBD	M	
A	200-12	202.6	Superelevation of Compound Curves	Superelevation of compound curves should follow the procedure as shown in Figure 202.6. Where feasible, the criteria in Index 202.5 should apply.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	
M	200-12	202.7	Superelevation on City Streets and County Roads	Superelevation rates of local streets and roads within the State right of way (with or without connection to State facilities) shall conform to AASHTO standards, for functional classification of the facility in question.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	200-12	202.7	Superelevation on City Streets and County Roads	If the local agency having jurisdiction over the facility in question maintains design standards that exceed AASHTO standards, then the local agency standards should apply.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	200-12	203.1	General Controls	For local facilities which are within State right of way and where there is no connection or the connection is to a non-controlled access facility (conventional highway), AASHTO standards shall prevail.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	200-12	203.1	General Controls	If the local agency having jurisdiction over the facility in question maintains design standards that exceed AASHTO standards, then the local agency standards should prevail.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	200-12	203.1	General Controls	Horizontal alignment shall provide at least the minimum stopping sight distance for the chosen design speed at all points on the highway, as given in Table 201.1 and explained in Index 201.3.	M	M	M	M	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M	M
M	200-16	203.2	Standards for Curvature	Table 203.2 shall be the minimum radius of curve for a specific design speeds on highways.	M	M	M	M	M	TBD	TBD	TBD	V	V	V	V	M	TBD	N/A	TBD	V	V	V	V	M	TBD	TBD	TBD	
M	200-16	203.2	Standards for Curvature	If the minimum radii indicated in Table 203.2 does not provide the desired lateral clearance to an obstruction, Figure 201.6 shall govern.	M	M	M	M	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	
A	200-16	203.3	Alignment Consistency	Where physical restrictions on curve radius cannot be overcome and it becomes necessary to introduce curvature of lower standard than the design speed for a project, the design speed between successive curves should change not more than 10 miles per hour. Introduction of curves with lower design speeds should be avoided at the end of long tangents, steep downgrades, or at other locations where high approach speeds may be anticipated.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	
A	200-16 & 200-17	203.5	Compound Curves	Where compound curves are necessary, the shorter radius should be at least two-thirds the longer radius when the shorter radius is 1,000 feet or less.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	200-16 & 200-17	203.5	Compound Curves	On one-way roads, the larger curve should follow the smaller radius.	N/A	N/A	N/A	N/A	M	V	V	V	N/A	N/A	N/A	N/A	N/A	M	N/A	M	N/A	N/A	N/A	N/A	V	V	V	V	
A	200-17	203.6	Reversing Curves	When horizontal curves reverse direction the connecting tangents should be long enough to accommodate the standard superelevation runoffs given on Figure 202.5. If this is not possible, the 6 percent per 100 feet rate of change should govern (see Index 202.5(3)).	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	N/A	N/A	N/A	M	M	M	M	M	N/A	N/A	N/A	N/A	
M	200-17	204.1	General Controls	For local facilities which are within State right of way and where there is no connection or the connection is to a non-controlled access facility (conventional highway), AASHTO standards shall prevail.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	200-17 & 200-18	204.1	General Controls	If the local agency having jurisdiction over the facility in question maintains design standards that exceed AASHTO standards, then the local agency standards should prevail.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	200-18	204.3	Standards for Grade	Table 204.3 shows the maximum grades which shall not be exceeded for the condition indicated.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	200-18	204.3	Standards for Grade	Minimum grades should be 0.5 percent in snow country and 0.3 percent at other locations.	V	V	V	V	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M	
A	200-18	204.3	Standards for Grade	Ramp grades should not exceed 8 percent.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M	

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A	200-18	204.4	Vertical Curves	For algebraic grade differences of 2 percent and greater, and design speeds equal to or greater than 40 miles per hour, the minimum length of vertical curve in feet should be equal to 10V, where V=design speed.	N/A	N/A	N/A	N/A	M	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	M	TBD	TBD	TBD
A	200-18	204.4	Vertical Curves	For algebraic grade differences of less than 2 percent, or design speeds less than 40 miles per hour, the vertical curve length should be a minimum of 200 feet.	N/A	N/A	N/A	N/A	V	TBD	TBD	TBD	V	TBD	TBD	TBD	V	TBD	N/A	TBD	V	TBD	TBD	TBD	M	TBD	TBD	TBD
A	200-19	204.5(2)	Sustained Grades	Decision sight distance (Table 201.7) should be provided at climbing lane drops on freeways.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-22	204.6	Coordination of Horizontal and Vertical Alignment	On highways in mountainous or rolling terrain where horizontal and vertical curves are superimposed at grade summit or sag, the design speed of the horizontal curve should be at least equal to that of the crest or sag, and not more than 10 miles per hour less than the measured or estimated running (85th percentile) speed of the vehicles on the approach roadway.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	200-23	204.8(5)	Grade Line of Structures (Falsework)	The minimum vertical falsework clearance over freeways and nonfreeways shall be 15 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TBD
A	200-25	205.1(1)	Access openings on Expressways (Criteria for Location)	Access openings should not be spaced closer than one-half mile to an adjacent public road intersection or to another private access opening that is wider than 30 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-25	205.1(1)	Access openings on Expressways (Criteria for Location)	To discourage wrong-way movements, access openings should be located directly opposite, or at least 300 feet from a median opening.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	200-25	205.1(1)	Access openings on Expressways (Criteria for Location)	Sight distance equivalent to that required for public road intersections shall be provided (see Index 405.1).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-28	206.3(1)	Pavement Reductions (Through Lane Drop)	When a lane is to be dropped, it should be done by tapering over a distance equal to WV, where W=Width of lane to be dropped and V=Design Speed.	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-30	206.3(3)	Pavement Reductions (Lane Reductions)	At any location where lane widths are being reduced, the minimum length over which to accomplish the transition should be equal to WV.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	200-35	208.1(1)	Bridge Lane and Shoulder Width (State Highways)	The clear width of all bridges, including grade separation structures, shall equal the full width of the traveled way and paved shoulders on approaches with the following exceptions: (a) Bridges to be constructed as replacements on existing 2-lane, 2-way roads shall not have less than a 32-foot wide roadbed for ADT less than 400, and not less than 40-foot wide roadbed for ADT greater than 400. (see Index 307.2). (b) When the approach shoulder width is less than 4 feet, the minimum offset on each side shall be 4 feet, and shall be documented in accordance with Index 82.2.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	M	M	N/A	M	N/A	N/A	N/A	N/A	M	M	M	M
A	200-35	208.3	Median	On multilane divided highways a bridge median that is 36 feet wide or less should be decked.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	200-37	208.4	Bridge Sidewalks	The minimum width of a bridge sidewalk shall be 6 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-37	208.6	Bicycle and Pedestrian Overcrossings and Undercrossings	The minimum width of walkway for pedestrian overcrossing should be 8 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-37	208.6	Bicycle and Pedestrian Overcrossings and Undercrossings	The minimum vertical clearance of a pedestrian undercrossing should be 10 feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-37	208.6	Bicycle and Pedestrian Overcrossings and Undercrossings	Class I bikeways are designed for the exclusive use of bicyclists and pedestrians; equestrian access is prohibited.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-38	208.10(2)	Bridge Barriers and Railings (Policies)	To reduce the risk of objects being dropped or thrown upon vehicles, protective screening in the form of fence-type railings should be installed along new overcrossing structure sidewalks in urban areas (Sec. 92.6 California Streets and Highways Code).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4
M	200-38	208.10(2)	Bridge Barriers and Railings (Policies)	Any use of railings and barriers with sidewalks on structures with posted speeds greater than 45 miles per hour shall have a barrier separation between the roadway and the sidewalk.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	200-50	208.10(6)	Bridge Barriers and Railings (Bicycle Railing)	As a general policy, bicycle railings should be installed at the following locations: (a) On a Class I bikeway, except that a lower rail may be used if a curbed sidewalk, not signed for bicycle used. Separates the bikeway from the rail or a shoulder at least 8 feet wide exists on the other side of the rail. (b) On the outside of a Class II or III bikeway, unless a curbed sidewalk, not signed for bicycle use, separates the bikeway from the rail.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	200-50	208.10(7)	Bridge Barriers and Railings (Bridge Approach Railings)	Approach railings shall be installed at the ends of bridge railings exposed to approach traffic.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	M	M	N/A	M	N/A	N/A	N/A	N/A	M	M	M	M
A	200-54	210.6	Safety Railing, Fences, and Concrete Barriers	Cable railing should be installed for employee protection in areas where employees may work adjacent to and above vertical faces of retaining walls, wingwalls, abutments, etc. where the vertical fall is 4 feet or more.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	N/A	N/A	M	M	N/A	N/A	N/A	M
M	300-1	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, except as follows: • For conventional State highways with posted speeds less than or equal to 40 miles per hour and AADTT (truck volume) less than 250 per lane that are in urban, city or town centers (rural main streets), the minimum lane width shall be 11 feet. Where a 2-lane conventional State highway connects to a freeway within an interchange, the lane width shall be 12 feet. Where a multilane State highway connects to a freeway within an interchange, the outer most lane of the highway in each direction shall be 12 feet.	V	M	M	M	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M
M	300-1	301.2(1)	Class II Bikeway (Bike Lanes) Lane Width (General)	Class II bikeways (bike lanes), for preferential use of bicycles, may be established within the roadbed and shall be located immediately adjacent to a traffic lane as allowed in this manual.	N/A	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-1	301.2(1)	Class II Bikeway (Bike Lanes) Lane Width (General)	The minimum Class II bikeway lane width shall be 4 feet, except where:	N/A	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-1	301.2(1)	Class II Bikeway (Bike Lanes) Lane Width (General)	Adjacent to on-street parking, the minimum bike lane should be 5 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-1	301.2(1)	Class II Bikeway (Bike Lanes) Lane Width (General)	Posted speeds are greater than 40 miles per hour, the minimum bike lane should be 6 feet. Or	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-1	301.2(1)	Class II Bikeway (Bike Lanes) Lane Width (General)	On highways with concrete curb and gutter, a minimum width of 3 feet measured from the bike lane stripe to the joint between the shoulder pavement and the gutter shall be provided.	N/A	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-2	301.3(2)(a)	Cross Slopes (Standards)	The standard cross slope to be used for new construction on the traveled way for all types of surfaces shall be 2 percent.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
M	300-2	301.3(2)(b)	Cross Slopes (Standards)	For resurfacing or widening (only when necessary to match existing cross slope). The minimum shall be 1.5 percent and the maximum shall be 3 percent.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
M	300-2	301.3(2)(c)	Cross Slopes (Standards)	On unpaved roadway surfaces, including gravel and penetration treated earth, the cross slope shall be 2.5 percent to 5.0 percent.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-2	301.3(2)	Cross Slopes (Standards)	For rehabilitation and widening projects, the maximum algebraic difference in cross slope between adjacent lanes of opposing traffic for either 2-lane or undivided multilane highways should be 6 percent.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-2	301.3(2)	Cross Slopes (Standards)	For new construction, the maximum shall be 4 percent.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



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					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4
A	300-2	301.3(2)	Cross Slopes (Standards)	The maximum algebraic difference in cross slope between same direction traffic lanes of divided highway roadbeds should be 4 percent.	N/A	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
A	300-2	301.3(2)	Cross Slopes (Standards)	The maximum difference in cross slope between the traveled way and the shoulder should not exceed 8 percent.	N/A	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
A	300-3	301.3(2)	Cross Slopes (Standards)	At freeway entrances and exits, the maximum difference in cross slope between adjacent lanes, or between lanes and gore areas, should not exceed 5 percent.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD		
M	300-3	302.1	Width	The shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder on highways.	V	M	M	M	V	V	V	V	V	V	V	V	V	V	N/A	M	V	V	M	M	V	V		
M	300-3	302.1	Width	Where rumble strips are placed in the shoulder, the shoulder shall be a minimum of 4 feet wide to the right of the grooved rumble strip when a vertical element, such as curb or guardrail is present or a minimum of 3 feet wide when the vertical element is not present.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
M	300-3	302.2(1)	Cross Slopes (General)	When a roadway crosses a bridge structure, the shoulder shall be in the same plane as the adjacent traveled way.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	U	TBD	N/A	TBD	N/A	N/A	N/A	N/A	U	TBD		
M	300-3	302.2(2)	Cross Slopes (Left Shoulders)	In depressed median sections, shoulders to the left of traffic shall be sloped at 2 percent away from the traveled way.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
M	300-3	302.2(2)	Cross Slopes (Left Shoulders)	In paved median sections, shoulders to the left of traffic shall be designed in the plane of the traveled way.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD		
M	300-3	302.2(3)	Cross Slopes (Right Shoulders)	In normal tangent sections, shoulders to the right of traffic shall be sloped at 2 percent to 5 percent away from the traveled way.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD		
A	300-7	303.1	General Policy	The use of curb should be avoided on facilities with posted speeds greater than or equal to 40 miles per hour, except as noted in Table 303.1. For projects where the use of curb is appropriate, it should be the type shown in Table 303.1.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD		
A	300-9	303.3	Dike Types and Uses	Dikes should be selected as illustrated in Figure 303.3.	U	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD		
A	300-11	303.4(1)	Curb Extensions (Bulbouts)	Bulbouts should conform to Figure 303.4, other design elements are not shown.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
M	300-11	303.4(1)	Curb Extensions (Bulbouts)	The curb face of the bulbout shall be setback from the edge of traveled way such that there is a minimum of 3 feet measured from the edge of traveled way to the joint between the shoulder pavement and the gutter pan or 3 feet to curb face without gutter pan.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
A	300-13	304.1	Side Slope Standards	For new construction, widening, or where slopes are otherwise being modified, embankment (fill) slopes should be 4:1 or flatter.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD		
A	300-13	304.1	Side Slope Standards	In light grading where normal slopes catch in a distance less than 18 feet from the edge of shoulder, a uniform catch point, at least 18 feet from edge of the shoulder, should be used.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD		
A	300-16	305.1	Width	Where pedestrians are allowed to cross 4 or more lanes at a marked or unmarked crosswalk, a pedestrian refuge island should be provided.	N/A	N/A	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
A	300-16	305.1	Width	Minimum median widths for the design year (as described below) should be used in order to accommodate the ultimate highway facility (type and number of lanes).	V	V	V	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
A	300-16	305.1(1)(a)	Width (Freeways and Expressways)(Urban Areas)	the minimum median width for freeways and expressways in urban areas should be 36 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
A	300-16	305.1(1)(b)	Width (Freeways and Expressways)(Rural Areas)	The minimum median width for freeways and expressways in rural areas should be 62 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
A	300-16	305.1(2)	Width (Conventional Highways)	In Urban and Rural Main Street areas, the minimum median width for multilane conventional highways should be 18 feet. For two lane conventional highways, the minimum median width should be 12 feet.	V	V	V	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
M	300-17	305.1(2)	Width (Conventional Highways)	In rural areas the minimum median width for multilane conventional highways shall be 12 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

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M or A	HDM Page #	HDM Index	HDM Index Heading	Design Standard	Katella Avenue				NB Exit Ramps				NB Entrance Ramp				SB Loop Entrance Ramp				SB Direct Entrance Ramp				SB Loop Exit Ramp / C-D Ramp			
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A	300-17	305.1(2)	Width (Conventional Highways)	At locations where a climbing or passing lane is added to a 2-lane conventional highway, a 4-foot median (or "soft barrier") between opposing traffic lanes should be used.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-17	305.1(3)(a)	Width (Facilities under Restrictive Conditions) (Freeways and Expressways)	In areas where restrictive conditions prevail the minimum median width shall be 22 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-17	305.2	Median Cross Slopes	Unsurfaced medians up to 65 feet wide should be sloped downward from the adjoining shoulders to form a shallow valley in the center. Cross slopes should be 10:1 or flatter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-20	307.2	Two-lane Cross Sections for New Construction	Shoulder widths based on design year traffic volumes shall conform to the standards given in Table 307.2.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-24	308.1	City Streets and County Roads	Where a local facility within the State right of way crosses over or under a freeway or expressway but has no connection to the State facility, the minimum design standards for the cross section of the local facility within the State's right of way shall be those found in AASHTO.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-24	308.1	City Streets and County Roads	If the local agency has standards that exceed AASHTO standards, then the local agency standards should apply.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-24	308.1	City Streets and County Roads	The minimum width of 2-lane overcrossing structures shall not be less than 32 feet face of curb to face of curb.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-25	308.1	City Streets and County Roads	Where a local facility crosses over or under a freeway or expressway and connects to the State facility (such as ramp terminal intersections), the minimum design standards for the cross section of the local facility shall be at least equal to those for a conventional highway with the exception that the outside shoulder width shall match the approach roadway, but not less than 4 feet, and as shown below.	V	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-25	308.1	City Streets and County Roads	Where the 2-lane local facility connects to a freeway within an interchange, the lane width of the local facility shall be 12 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-25	308.1	City Streets and County Roads	Where a multilane local facility connects to a freeway within an interchange, the outer most lane in each direction of the local facility shall be 12 feet.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-25	308.1	City Streets and County Roads	Shoulder width shall not be less than 5 feet when railings or other lateral obstructions are adjacent to the right edge of shoulder.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-25	308.1	City Streets and County Roads	If gutter pans are used, then the minimum shoulder width shall be 3 feet wider than the width of the gutter pan being used.	V	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-25	308.1	City Streets and County Roads	The minimum width for two-lane overcrossing structures at interchanges shall be 40 feet curb-to-curb.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-25	309.1(1)	Horizontal Clearances for Highways (General)	Horizontal clearances greater than those cited below under subsection (3) - "Minimum Clearances" shall be provided where necessary to meet horizontal stopping sight distance requirements.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
A	300-25	309.1(2)	Horizontal Clearances for Highways (Clear Recovery Zone (CRZ))	Fixed objects, including bridge piers, abutments, retaining walls, and noise barriers closer to the edge of traveled way than the distances listed above should be eliminated, moved, redesigned to be made yielding, or shielded in accordance with the following guidelines:	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
M	300-26	309.1(2)	Horizontal Clearances for Highways (Clear Recovery Zone (CRZ))	Where compliance with the above stated clear recovery zone guidelines are impractical, the minimum horizontal clearance cited below shall apply to the unshielded fixed object. These minimum horizontal clearances apply to yielding objects as well.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD

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					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	
M	300-26	309.1(3)	Horizontal Clearances for Highways (Minimum Clearances)	The following minimum horizontal clearances shall apply to all objects that are closer to the edge of traveled way than the clear recovery zone distances listed above: (a) The minimum horizontal clearances to all objects, such as bridge rails and safety-shaped concrete barriers, as well as sand-filled barrels, metal beam guardrail, etc., on freeway and expressway facilities, including auxiliary lanes, ramps, and collector roads, shall be equal to the standard shoulder width of the highway facility as stated in Table 302.1. A minimum clearance of 4 feet shall be provided where the standard shoulder is less than 4 feet.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	
M	300-26	309.1(3)	Horizontal Clearances for Highways (Minimum Clearances)	(b) The minimum horizontal clearance to walls, such as abutment walls, retaining walls in cut locations, and noise barriers on all facilities, including auxiliary lanes, ramps and collector roads, shall be not less than 10 feet per Table 203.1.	M	M	M	M	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TBD
M	300-26	309.1(3)	Horizontal Clearances for Highways (Minimum Clearances)	(c) On conventional highways, frontage roads, city streets and county roads (all without curbs), the minimum horizontal clearance shall be the standard shoulder width as listed in Tables 302.1 and 307.2.	U	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	300-26	309.1(3)	Horizontal Clearances for Highways (Minimum Clearances)	On conventional highways with curbs, typically in urban conditions, a minimum horizontal clearance of 1 foot 6 inches should be provided beyond the face of curbs to any obstruction.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	300-26	309.1(3)	Horizontal Clearances for Highways (Minimum Clearances)	In areas without curbs, the face of Type 60 concrete barrier should be constructed integrally at the base of any retaining, pier, or abutment wall which faces traffic and is 15 feet or less from the edge of traveled way (right or left of traffic and measured from the face of the wall).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	300-27	309.1(4)	Horizontal Clearances for Highway (High Speed Rail Clearances)	When a high speed rail corridor is to be constructed longitudinally to a freeway, expressway or a conventional highway with posted speeds over 40 miles per hour, the nearest fixed object or feature associated with the operation of the rail facility should be located a minimum of 52 feet horizontally from the planned ultimate edge of the traveled way.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	300-27	309.2(1)(a)	Vertical Clearances (Major Structures)	Freeways and Expressways, All construction except overlay projects - 16 feet 6 inches shall be the minimum vertical clearance over the roadbed of the State facility (e.g., main lanes, shoulders, ramps, collector-distributor roads, speed change lanes, etc.).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TBD	
M	300-27	309.2(1)(b)	Vertical Clearances (Major Structures)	Freeways and Expressways, Overlay projects - 16 feet shall be the minimum vertical clearance over the roadbed of the State facility .	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	300-27	309.2(1)(c)	Vertical Clearances (Major Structures)	Conventional Highways, Parkways, and Local Facilities, All projects - 15 feet shall be the minimum vertical clearance over the traveled way and 14 feet 6 inches shall be the minimum vertical clearance over the shoulders of all portions of the roadbed.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	300-27	309.2(2)	Vertical Clearances (Minor Structures)	Pedestrian over-crossings shall have a minimum vertical clearance 2 feet greater than the standard for major structures for the State facility in question.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	300-27	309.2(2)	Vertical Clearances (Minor Structures)	Sign structures shall have a minimum vertical clearance of 18 feet over the roadbed of the State facility.	U	TBD	TBD	TBD	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	300-27	309.2(3)	Vertical Clearances (Rural Interstates and Single Routing in Urban Areas)	Vertical clearance for structures on this system shall meet the standards listed above for freeways and expressways.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	300-32	309.3(1)	Tunnel Clearances (Horizontal Clearances)	In one-way tunnels on conventional highways the minimum side clearance from the edge of the traveled way shall be 4 feet 6 inches on the left and 6 feet on the right.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	300-32	309.3(1)	Tunnel Clearances (Horizontal Clearances)	For two-way tunnels, this clearance shall be 6 feet on each side.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

CALTRANS DESIGN EXCEPTION CHECKLIST (for HDM dated 11-2-12)

I-605/Katella Ave Interchange Improvements PSR-PDS				M = Meets Design Std. V = Violates Design Std. (exception needed) N/A = Not Applicable U = Unknown (needs to be calc'd from topo) TBD = To Be Determined during PAED																												
M or A	HDM Page #	HDM Index	HDM Index Heading	Design Standard	Katella Avenue				NB Exit Ramps				NB Entrance Ramp				SB Loop Entrance Ramp				SB Direct Entrance Ramp				SB Loop Exit Ramp / C-D Ramp							
					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4				
M	300-32	309.3(2)	Tunnel Clearances (Vertical Clearances)	The minimum vertical clearance shall be 15 feet measured at any point over the traveled way and 14 feet 6 inches above the gutter at the curb line. On freeways and expressways, the minimum vertical clearance listed in Index 309.2(1)(a) shall be used.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-32	309.4	Lateral Clearance for Elevated Structures	The minimum horizontal clearance between elevated highway structures, such as freeway viaducts and ramps, and adjoining buildings or other structures, shall be 15 feet for single-deck structures 20 feet for double-decked structures. Spot encroachment on this clearance shall be approved in accordance with Index 82.2.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-32	309.5(1)	Structures Across or Adjacent to Railroads (Normal Horizontal and Vertical Clearances)	A minimum of 23 feet 4 inches should be used in design to allow for rebalasting and normal maintenance of track. Railroads on which freight cars are not operated, should have a minimum vertical clearance of 19 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-33	309.5(1)	Structures Across or Adjacent to Railroads (Normal Horizontal and Vertical Clearances)	However, the greater clearances specified under Index 309.2 shall be used.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-33	310.1	Frontage Roads (Cross Section)	However, the minimum paved 2-lane cross section width, including 4-foot shoulders without curb and gutter shall be: • 32 feet if 12-foot lanes are to be provided; • 30 feet if 11-foot lanes are to be provided.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	300-33	310.1	Frontage Roads (Cross Section)	The minimum paved 2-lane cross section width, including 5-foot shoulders and curb and gutter shall be: • 34 feet if 12-foot lanes are to be provided; • 32 feet if 11-foot lanes are to be provided.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-33	310.2	Frontage Roads (Outer Separation)	In urban areas and in mountainous terrain, the width of the outer separation should be a minimum of 26 feet from edge of traveled way to edge of traveled way.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	300-33	310.2	Frontage Roads (Outer Separation)	In rural areas, other than mountainous terrain, the width of the outer separation should be a minimum of 40 feet from edge of traveled way to edge of traveled way.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-5	403.3	Angle of Intersection	When a right angle cannot be provided due to physical constraints, the interior angle should be designed as close to 90 degrees as is practical, but should not be less than 75 degrees. Mitigation should be considered for the affected intersection design features.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-6	403.6(1)	Turning Traffic (Treatment of Intersections with Right-Turn-Only Lanes)	Optional right-turn lanes should not be used in combination with right-turn-only lanes on roads where bicycle travel is permitted.	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-6	403.6(1)	Turning Traffic (Treatment of Intersections with Right-Turn-Only Lanes)	Locations with right-turn-only lanes should provide a minimum 4-foot width for bicycle use between the right-turn and through lane when bikes are permitted.	V	V	V	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-10	404.2(1)(b)	Design Considerations (Traveled Way)	The tracking and swept widths lines for the design vehicle shall stay within the lane as defined in Index 301.1 and Table 504.3A.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
A	400-12	404.4(1)(b)	Design Vehicles and Related Definitions (The Surface Transportation Assistance Act of 1982 (STAA))	The STAA Design Vehicle in Figures 404.5A or B should be used in the design of all projects on the National Network and on Terminal Access routes.	U	M	M	M	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
M	400-12	404.4(1)(b)	Design Vehicles and Related Definitions (The Surface Transportation Assistance Act of 1982 (STAA))	Where the use of the STAA Design Vehicle is not practical, the California Legal Design Vehicle shall be used.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-12	404.4(2)(b)	Design Vehicles and Related Definitions (California Legal)	The California Legal Design Vehicle in Figures 404.5C and D should be used in the design of all non-STAA route interchanges and intersections on California Legal routes and California Legal KPRA Advisory routes for both new construction and rehabilitation projects.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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I-605/Katella Ave Interchange Improvements PSR-PDS

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M or A	HDM Page #	HDM Index	HDM Index Heading	Design Standard	Katella Avenue				NB Exit Ramps				NB Entrance Ramp				SB Loop Entrance Ramp				SB Direct Entrance Ramp				SB Loop Exit Ramp / C-D Ramp			
					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4
A	400-13	404.4(4)(b)	Design Vehicles and Related Definitions (45-foot Bus and Motorhome)	The 45-foot Bus and Motorhome Design Vehicle in Figure 404.5F should be used in the design of all interchanges and intersections on all green routes on the "Motorcoach and Motorhome Map" for both new construction and rehabilitation projects.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-14	405.1(2)(a)	Sight Distance (Corner Sight Distance)	Set back for the driver of the vehicle on the crossroad shall be a minimum of 10 feet plus the shoulder width of the major road but not less than 15 feet.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-22	405.1(2)(b)	Sight Distance (Corner Sight Distance)	At unsignalized public road intersections (see Index 405.7) corner sight distance values given in Table 405.1A should be provided.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-22	405.1(2)(b)	Sight Distance (Corner Sight Distance)	Where restrictive conditions exist, similar to those listed in Index 405.1(2)(a), the minimum value for corner sight distance at both signalized and unsignalized intersections shall be equal to the stopping sight distance as given in Table 201.1, measured as previously described.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-22	405.1(2)(c)	Sight Distance (Corner Sight Distance)	The minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1, measured as previously described.	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-22	405.1(3)	Sight Distance (Decision Sight Distance)	At intersections where the State route turns or crosses another State route, the decision sight distance values given in Table 201.7 should be used. In computing and measuring decision sight distance, the 3.5-foot eye height and the 0.5-foot object height should be used, the object being located on the side of the intersection nearest the approaching driver.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-23	405.2(2)(a)	Left-turn Channelization (Design Elements - Lane Widths)	The lane width for both single and double left-turn lanes on State highways shall be 12-feet	V	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-23	405.2(2)(a)	Left-turn Channelization (Design Elements - Lane Widths)	For conventional State highways with posted speeds less than or equal to 40 miles per hour and AADTT (truck volumes) less than 250 per lane that are in urban, city or town centers (rural main streets), the minimum lane width shall be 11 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-25	405.2(4)	Left-turn Channelization (Two-way Left-turn Lane (TWLTL))	The minimum width for a TWLTL shall be 12 feet (see Index 301.1).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	400-25	405.3(2)(a)	Right-turn Channelization (Design Elements)	Lane and Shoulder Width - Index 301.1 shall be used for right-turn lane width requirements. Shoulder width shall be a minimum of 4 feet.	V	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-30	405.4(3)	Traffic Islands (Pedestrian Refuge)	Traffic islands used as pedestrian refuge should be large enough to provide a minimum of 6 feet in the direction of pedestrian travel.	N/A	N/A	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-32	405.5(2)	Median Openings) Spacing and Location)	Emergency passageways should be located only where decision sight distance is available (see Table 201.7).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	400-32	405.5(2)	Median Openings) Spacing and Location)	Median openings should be spaced at intervals no closer than 1600 feet. If a median opening falls within 300 feet of an access opening, it should be placed opposite the access opening.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-1	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 interchanges and other interchanges. The minimum interchange spacing on Interstates outside a Transportation Management Area shall be three miles.	V	V	V	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-2	502.2	Local Street Interchanges	Isolated off-ramps or partial interchanges shall not be used because of the potential for wrong way movements.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-6	502.3(1)	Freeway-to-Freeway Interchanges (General)	Interstate routes shall maintain route continuity. Where both the designated route and heavier traffic volume route are present, the interchange configuration shall keep the designated route to the left through the interchange.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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M or A	HDM Page #	HDM Index	HDM Index Heading	Design Standard	Katella Avenue				NB Exit Ramps				NB Entrance Ramp				SB Loop Entrance Ramp				SB Direct Entrance Ramp				SB Loop Exit Ramp / C-D Ramp			
					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4
M	500-11	504.2(1)	Freeway Entrances and Exits (Basic Policy)	All freeway entrances and exits, except for direct connections with median High-Occupancy Vehicle (HOV) lanes, Express Toll lanes or BRT lanes, shall connect to the right of through traffic.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M
A	500-11	504.2(2)	Freeway Entrances and Exits (Standard Designs)	Design of freeway entrances and exits should conform to the standard design illustrated in Figure 504.2A-B (single lane) and Figure 504.3L (two-lane entrances and exits) and/or Figure 504.4 (diverging branch connections), as appropriate.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	N/A	N/A	N/A	U	N/A	N/A	N/A	U	N/A	N/A	N/A	U	N/A	N/A	N/A
M	500-11	504.2(2)	Freeway Entrances and Exits (Standard Designs)	The minimum deceleration length shown on Figure 504.2B shall be provided prior to the first curve beyond the exit nose to ensure adequate distance for vehicles to decelerate before entering the curve.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	N/A	N/A	N/A
A	500-11	504.2(2)	Freeway Entrances and Exits (Standard Designs)	The same standard should apply for the first curve after the exit from a collector-distributor road.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-11	504.2(2)	Freeway Entrances and Exits (Standard Designs)	The exit nose shown in Figure 504.2B may be located downstream of the 23-foot dimension; however, the maximum paved width between the mainline and ramp shoulder edge should be 20 feet.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M
A	500-11	504.2(2)	Freeway Entrances and Exits (Standard Designs)	Contrasting surface treatment beyond the gore pavement should be provided on both entrance and exit ramps as shown on Figures 504.2A, 504.2B, and 504.3L.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M
A	500-14	504.2(3)	Freeway Entrances and Exits (Location on a Curve)	When an exit must be located where physical restrictions to visibility cannot be corrected by cut widening or object removal, an auxiliary lane in advance of the exit should be a minimum of 600 feet, 1,000 feet preferred.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-14	504.2(4)	Freeway Entrances and Exits (Design Speed Considerations)	The design speed at the exit nose should be 50 miles per hour or greater for both ramps and branch connections.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M
A	500-14	504.2(4)(a)	Freeway Entrances and Exits (Design Speed Considerations - Freeway Exit)	Decision sight distance given in Table 201.7 should be provided at freeway exits and branch connectors. At secondary exits on collector-distributor roads, a minimum of 600 feet of decision sight distance should be provided.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M
A	500-14	504.2(4)(b)	Freeway Entrances and Exits (Design Speed Considerations - Freeway Entrance)	The design speed at the inlet nose should be consistent with approaching alignment standards. If the approach is a branch connection of diamond ramp with high alignment standards, the design speed should be at least 50 miles per hour.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A
A	500-14	504.2(5)	Freeway Entrances and Exits (Grades)	Ramp profile grades should not exceed 8 percent with the exception of descending entrance ramps and ascending exit ramps, where a 1 percent steeper grade is allowed. However, the 1 percent steeper grade should be avoided on descending loops to minimize overdriving of the ramp (see Index 504.3(8)).	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M
A	500-14	504.2(5)	Freeway Entrances and Exits (Grades)	Where adjacent lanes or lanes and paved gore areas at freeway entrances and exits are not in the same plane, the algebraic differences in pavement cross slope should not exceed 5 percent (see Index 301.2).	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
A	500-15	504.2(5)(a)	Freeway Entrances and Exits (Grades - Freeway Exits)	Vertical curves located just beyond the exit nose should be designed with a minimum 50 miles per hour stopping sight distance.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD
A	500-15	504.2(5)(a)	Freeway Entrances and Exits (Grades - Freeway Exits)	If the ramp ends in a crest vertical curve, the last 50 feet of the ramp should be on a 5 percent grade or less.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-15	504.2(5)(a)	Freeway Entrances and Exits (Grades - Freeway Exits)	On descending off-ramps, the sag vertical curve at the ramp terminal should be a minimum of 100 feet in length.	N/A	N/A	N/A	N/A	N/A	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TBD	TBD	TBD
A	500-15	504.2(5)(b)	Freeway Entrances and Exits (Grades - Freeway Entrances)	Where truck volumes (three-axle or more) exceed 20 per hour on ascending entrance ramps to freeways and expressways with sustained grades exceeding 2 percent, a 1,500-foot length of auxiliary lane should be provided in order to ensure satisfactory operating conditions.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
A	500-15	504.3(1)(a)	Ramps (General - Design Speed)	When ramps terminate at an intersection at which all traffic is expected to make a turning movement, the minimum design speed along the ramp should be 25 miles per hour.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	TBD	N/A	N/A	N/A	N/A	N/A

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A	500-15	504.3(1)(a)	Ramps (General - Design Speed)	When a "through" movement is provided at the ramp terminus, the minimum ramp design speed should meet or exceed the design speed of the highway facility for which the through movement is provided.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-15	504.3(1)(b)	Ramps (General - Lane Width)	Ramp lanes shall be a minimum of 12 feet in width.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M
M	500-15	504.3(1)(b)	Ramps (General - Lane Width)	Where ramps have curve radii of 300 feet or less, measured along the outside edge of traveled way for single lane ramps or along the outside lane line for multilane ramps, with a central angle greater than 60 degrees, the single ramp lane, or the lane furthest to the right if the ramp is multilane, shall be widened in accordance with 504.3 in order to accommodate large truck wheel paths.	N/A	N/A	N/A	N/A	V	M	M	M	N/A	N/A	N/A	N/A	V	V	N/A	M	V	V	M	M	V	V	V	M
M	500-16	504.3(1)(c)	Ramps (General - Shoulder Width)	Shoulder width for ramps shall be as indicated in Table 302.1.	N/A	N/A	N/A	N/A	V	V	V	V	V	V	V	V	V	V	N/A	M	V	V	M	M	V	V	V	M
A	500-16	504.3(1)(d)	Ramps (General - Lane Drops)	Depending on approach geometry and speed, the lane drop transition between the limit line and the 6-foot separation point should be accomplished with a taper of between 30:1 and 50:1 (longitudinal to lateral).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	V	V	V	V	N/A	N/A	N/A	M	M	M	V	M	N/A	N/A	N/A	N/A
M	500-16	504.3(1)(d)	Ramps (General - Lane Drops)	However, the lane drop taper past the limit line shall not be less than 15 to 1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	M	M	M	M	M	N/A	N/A	N/A	N/A
A	500-16	504.3(1)(d)	Ramps (General - Lane Drops)	Lane drop tapers should not extend beyond the 6-foot point (the beginning of the weaving length) without the provision of an auxiliary lane.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A
A	500-16	504.3(2)(a)	Ramps (Ramp Metering - Metered Single-Lane Entrance Ramps)	Where truck volumes (three-axle or more) are 5 percent or greater on ascending entrance ramps to freeways with sustained grades exceeding 3 percent (i.e., at least throughout the merge area) a minimum 500-foot length of auxiliary lane should be provided beyond the ramp convergence point.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-17	504.3(2)(b)	Ramps (Ramp Metering - Metered Multilane Ramps)	Therefore, depending on approach geometry and speed, the lane drop transition between the limit line and the 6-foot separation point should be accomplished with a taper of between 30:1 and 50:1 (longitudinal to lateral).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	V	V	V	V	N/A	N/A	N/A	M	M	M	V	M	N/A	N/A	N/A	N/A
M	500-17	504.3(2)(b)	Ramps (Ramp Metering - Metered Multilane Ramps)	However, the lane drop taper past the limit line shall not be less than 15 to 1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	M	M	M	M	M	N/A	N/A	N/A	N/A
A	500-17	504.3(2)(b)	Ramps (Ramp Metering - Metered Multilane Ramps)	Where truck volumes (three-axle or more) are 5 percent or greater on ascending entrance ramps to freeways with sustained grades exceeding 3 percent (i.e., at least throughout the merge area) a minimum 1,000-foot length of auxiliary lane should be provided beyond the ramp convergence point.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-17	504.3(2)(c)	Ramps (Ramp Metering - Metered Freeway-to-Freeway Connectors)	The installation of ramp meters on connector ramps shall be limited to those facilities which meet or exceed the following geometric design criteria: • Standard lane and shoulder widths. • "Tail light" sight distance, measured from 3 1/2 feet eye height to a 2-foot object height, is provided for a design speed of 50 miles per hour minimum.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-18	504.3(2)(c)	Ramps (Ramp Metering - Metered Freeway-to-Freeway Connectors)	All lane drop transitions on connectors shall be accomplished with a taper of 50:1 (Longitudinal to lateral).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-20	504.3(3)	Ramps (Location and Design of Ramp Intersections on the Crossroads)	Ramp terminals should connect where the grade of the overcrossing is 4 percent or less to avoid potential overturning of trucks.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	TBD	N/A	N/A	N/A	N/A	N/A
A	500-20	504.3(3)	Ramps (Location and Design of Ramp Intersections on the Crossroads)	For left-turn maneuvers from an off-ramp at an unsignalized intersection, the length of crossroads open to view should be greater than the product of the prevailing speed of vehicles on the crossroads, and the time required for a stopped vehicle on the ramp to execute a left-turn maneuver. This time is estimated to be 7 1/2 seconds.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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A	500-21	504.3(3)	Ramps (Location and Design of Ramp Intersections on the Crossroads)	Where a separate right-turn lane is provided at ramp terminals, the turn lane should not continue as a "free" right.	N/A	N/A	N/A	N/A	V	V	V	V	V	M	M	M	V	V	N/A	V	V	V	V	V	V	V	V	
M	500-21	504.3(3)	Ramps (Location and Design of Ramp Intersections on the Crossroads)	The minimum distance (curb return to curb return) between ramp intersections and local road intersections shall be 400 feet.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-21	504.3(3)	Ramps (Location and Design of Ramp Intersections on the Crossroads)	The preferred minimum distance should be 500 feet.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-21	504.3(5)	Ramps (Single-lane Ramps)	When additional lanes are provided near an entrance ramp intersection, the lane drop should be accomplished over a distance equal to WV.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	V	V	V	V	N/A	N/A	N/A	M	N/A	N/A	V	TBD	N/A	N/A	N/A	
A	500-22	504.3(5)	Ramps (Single-lane Ramps)	The lane to be dropped should be on the right so that traffic merges left.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	M	N/A	N/A	M	M	N/A	N/A	N/A	
A	500-22	504.3(5)	Ramps (Single-lane Ramps)	If the length of a single lane ramp exceeds 1,000 feet, an additional lane should be provided on the ramp to permit passing maneuvers.	N/A	N/A	N/A	N/A	V	V	V	V	M	M	M	M	N/A	N/A	N/A	M	V	V	M	M	M	M	V	V
A	500-22	504.3(6)	Ramps (Two-lane Exit Ramps)	Where design year estimated volumes exceed 1500 equivalent passenger cars per hour, a 2-lane ramp should be provided.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-22	504.3(6)	Ramps (Two-lane Exit Ramps)	An auxiliary lane approximately 1,300 feet long should be provided in advance of a 2-lane exit. For volumes less than 1500 but more than 900, a one-lane width exit ramp should be provided with provisions for adding auxiliary lanes and an additional lane on the ramp.	N/A	N/A	N/A	N/A	N/A	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TBD	TBD	TBD	
A	500-22	504.3(9)	Ramps (Distance Between Successive On-Ramps)	This distance should be about 1,000 feet unless the upstream ramp adds an auxiliary lane in which case the downstream ramp should merge with the auxiliary lane in a standard 50:1 (longitudinal to lateral) convergence.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-35	504.3(10)	Ramps (Distance Between Successive Exits)	The minimum distance between successive exit ramps for guide signing should be 1,000 feet on the freeway and 600 feet on collector-distributor roads.	N/A	N/A	N/A	N/A	N/A	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-35	504.4(2)	Freeway-to-Freeway Connections (Design Speed)	The design speed for single lane directional and all branch connections should be a minimum of 50 miles per hour. When smaller radius curves, with lower design speeds, are used the vertical sight distance should be consistent with approaching vehicle speeds.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-35	504.4(3)	Freeway-to-Freeway Connections (Grades)	The maximum profile grade on freeway-to-freeway connections should not exceed 6 percent.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	500-35	504.4(4)(a)	Freeway-to-Freeway Connections (Shoulder Width - Single-lane and Two-lane Connections)	The width of shoulders on single-lane and two-lane (except as described below) freeway-to-freeway connectors shall be 5 feet on the left and 10 feet on the right. A single-lane freeway-to-freeway connector that has been widened to two lanes solely to provide passing opportunities and not due to capacity requirements shall have a 5-foot left shoulder and at least a 5-foot right shoulder.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
M	500-35	504.4(4)(b)	Freeway-to-Freeway Connections (Shoulder Width - Three-lane Connections)	The width of shoulders on three-lane connectors shall be 10 feet on both the left and right sides.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-35	504.4(5)	Freeway-to-Freeway Connections (Single-lane Connections)	Where design year volume is between 900 and 1500 equivalent passenger cars per hour, initial construction should provide a single lane connection with the capability of adding an additional lane. Single lane directional connectors should be designed using the general configurations shown in Figure 504.2A and 504.2B, but utilizing the flatter divergence angle shown in Figure 504.4.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
A	500-36	504.4(5)	Freeway-to-Freeway Connections (Single-lane Connections)	Single lane connectors in exceed of 1,000 feet in length should be widened to two lanes to provide for passing maneuvers.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	



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					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4
A	500-36	504.4(6)	Freeway-to-Freeway Connections (Branch Connections)	A branch connection should be provided when the design year volume exceeds 1500 equivalent passenger cars per hour.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-36	504.4(6)	Freeway-to-Freeway Connections (Branch Connections)	Merging branch connections should be designed as shown in Figure 504.3L.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-36	504.4(6)	Freeway-to-Freeway Connections (Branch Connections)	Diverging branch connections should be designed as shown in Figure 504.4.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-36	504.4(6)	Freeway-to-Freeway Connections (Branch Connections)	At a branch merge, a 2,500-foot length of auxiliary lane should be provided beyond the merge of one lane of the inlet, except where it does not appear that capacity on the freeway will be reached until five or more years after the 20 year design period. In this case the length of auxiliary lane should be a minimum of 1,000 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-36	504.4(6)	Freeway-to-Freeway Connections (Branch Connections)	For diverging connections where less than capacity conditions beyond the design year are anticipated, the length of auxiliary lane in advance of the exit should be 1,300 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-36	504.4(7)	Freeway-to-Freeway Connections (Lane Drops)	The lane drop taper on a freeway-to-freeway connector should not be less than WV.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-36	504.5	Auxiliary Lanes	Auxiliary lanes should be considered in all cases when the weaving distance, measured as shown in Figure 504.2A, is less than 2,000 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	500-36	504.6	Mainline Lane Reduction at Interchanges	The basic number of mainline lanes should not be dropped through a local service interchange.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-39	504.7	Weaving Sections	The minimum weaving length, measured as shown in Figures 504.2A and 504.2B shall be 2,000 feet in urban areas, 5,000 feet in rural areas, and 5,000 feet between freeway-to-freeway interchanges and other interchanges.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	500-39	504.8	Access Control	Access rights shall be acquired along interchange ramps to their junction with the nearest public road.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	M	M	M	M	M	M	M	M
A	500-39	504.8	Access Control	At such junctions, for new construction, access control should extend 100 feet beyond the end of the curb return or ramp radius in urban areas and 300 feet in rural areas, or as far as necessary to ensure that entry onto the facility does not impair operational characteristics.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	V	V	M	M	M	M	M	M
M	500-39	504.8	Access Control	Access control shall extend at least 50 feet beyond the end of the curb return, ramp radius, or taper.	N/A	N/A	N/A	N/A	M	M	M	M	M	M	M	M	M	M	N/A	M	V	V	M	M	M	M	M	M
M	500-39	504.8	Access Control	For new construction or major reconstruction, access rights shall be acquired on the opposite side of the local road from ramp terminals to preclude the construction of future driveways or local roads within the ramp intersection.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	610-1	612.2	New Construction and Reconstruction	The minimum pavement design life for new construction and reconstruction projects shall be not less than the values in Table 612.2 or the project design period (see Index 103.2), which ever is greater.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	610-1	612.3	Widening	The pavement design life for widening projects shall either match the remaining pavement service life of the adjacent roadway (but not less than the project design period as defined in Index 103.2), or the pavement design life values in Table 612.2 depending on which has the lowest life-cycle costs.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	610-3	612.5	Roadway Rehabilitation	The minimum pavement design life for rehabilitation projects shall be 20 years except for roadways with existing rigid pavements or a current Annual Average Daily Traffic (AADT) of at least 15,000 vehicles, where the minimum pavement design life shall be 20 or 40 years depending on which design life has the lowest life-cycle costs.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
A	610-3	612.6	Temporary Pavements and Detours	Temporary pavements and detours should be engineered to accommodate the anticipated traffic loading that the pavement will experience during the construction period.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD

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M	610-10	613.5(2)(b)	Specific Traffic Loading Considerations (Shoulders - New Construction and Reconstruction)	New or reconstructed shoulders shall be engineered to match the TI of the adjacent traffic lanes when any of the following conditions apply: • the shoulder width is less than 5 feet. • the median width is 14 feet or less. • on roads with less than two lanes in the direction of travel and there is a sustained (greater than 1 mile in length) grade of over 4 percent without a truck climbing lane. • the shoulders are adjacent to exclusive truck or bus only lanes, or weigh station ramps.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	610-10	613.5(2)(b)	Specific Traffic Loading Considerations (Shoulders - New Construction and Reconstruction)	For all other cases, the minimum TI for the shoulder shall match the TI of the adjacent traffic lane for the first 2 feet of the outside shoulder width and 1 foot of the inside shoulder measured from the edge of the traveled way.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	610-10	613.5(2)(b)	Specific Traffic Loading Considerations (Shoulders - New Construction and Reconstruction)	For the remaining width of the shoulder, the TI shall: • be no less than 2 percent of the projected ESALs of the adjacent traffic lane or a TI of 5, whichever is greater. • not exceed 9.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	610-10	613.5(2)(b)	Specific Traffic Loading Considerations (Shoulders - New Construction and Reconstruction)	The total depth of the shoulder pavement structure (depth from the surface to the subgrade) shall match the pavement structure grading plan of the adjacent traffic lane.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	620-3	622.4	Dowel Bars and Tie Bars	New or reconstructed rigid pavements and lane replacements shall be doweled except as noted below:	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	620-6	622.8	Transitions and Anchors	For CRCP, a terminal anchor or terminal joint shall be used at all transitions to or from structure approach slabs, JPCP, PPCP, or flexible pavement.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	620-22	625.1(2)	Rigid Pavement Rehabilitation Strategies (Overlay Limits)	On overlay projects, the entire traveled way and paved shoulder shall be overlaid.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
A	620-22	625.1(3)	Rigid Pavement Rehabilitation Strategies (Preparation of Existing Pavement)	Existing pavement distresses should be repaired before overlaying the pavement.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	620-26	626.2(4)(a)	Shoulder (Selection Criteria)	Tied rigid shoulders shall be used for: • Rigid pavements constructed in the High Mountain and High Desert climate regions (See climate map in Topic 615). • Paved buffers between rigid High-Occupancy Vehicle (HOV) lanes and rigid mixed flow lanes. Same for High-Occupancy Toll (HOT) lanes.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	620-26	626.2(4)(b)	Shoulder (Selection Criteria)	Either tied rigid shoulders or widened slabs shall be used for: • Continuously reinforced concrete pavement. • Horizontal radii 300 feet or less. • Truck and bus only lanes.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	620-26	626.2(4)	Shoulder (Selection Criteria)	Where tied rigid shoulders or widened slabs are used, they shall continue through ramp and gore areas (see Figure 626.2B).	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	630-7	633.1(3)	Empirical Method (Modifications for Pavement Design Life Greater than 20 Years)	The following enhancements shall be incorporated into all flexible pavements with a design life greater than twenty years.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	630-10	635.1(1)	Empirical Method (General)	On overlay projects, the entire traveled way and paved shoulder shall be overlaid.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
A	630-19	635.1(8)	Empirical Method (Preparation of Existing Pavement)	Existing pavement distresses should be repaired before overlaying the pavement.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
M	640-3	645.1	Empirical Method	On overlay projects, the entire traveled way and paved shoulder shall be overlaid.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD
A	640-3	645.1(3)	Empirical Method (Preparation of Existing Pavement)	Existing pavement distresses should be repaired before overlaying the pavement.	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD	N/A	TBD	N/A	TBD	N/A	TBD	TBD	TBD	N/A	TBD	TBD	TBD

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M	700-1	701.2(1)	Fences on Freeways and Expressways (Policy)	Fences shall be provided on freeways and expressways to control access (except as otherwise provided under paragraph (3)(e)).	N/A	N/A	N/A	N/A	M	TBD	TBD	TBD	M	TBD	TBD	TBD	M	M	TBD	TBD	M	M	TBD	TBD	M	M	TBD	TBD
A	700-1	701.2(1)	Fences on Freeways and Expressways (Policy)	Freeway fencing or equivalent access control should extend to the limit of the legal access control on local streets at ramp termini.	N/A	N/A	N/A	N/A	M	TBD	TBD	TBD	M	TBD	TBD	TBD	M	M	TBD	TBD	M	M	TBD	TBD	M	M	TBD	TBD
A	900-3	902.1(1)(b)	General (Design Considerations)	Median Planting - Median planting should not be permitted on freeways.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	900-3	902.2(1)	Sight Distance and Clear Recovery Zone Standards (Sight Distance Setbacks)	Proposed mature planting should maintain horizontal and vertical sight distances required by the design speed of the facility. In cases where, due to geometric restrictions, the existing facility does not provide 80 miles per hour sight distance, no further reduction should be caused by planting.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
A	900-4	902.2(2)	Sight Distance and Clear Recovery Zone Standards (Clear Recovery Zone)	The policy along freeways and expressways, including interchange areas, should be to strive for 40 feet or more of clearance between the edge of traveled way and large trees, but with a minimum clearance of 30 feet.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
A	900-4	902.2 (2)	Sight Distance and Clear Recovery Zone Standards (Clear Recovery Zone)	The minimum setback in these cases should be 25 feet.	N/A	N/A	N/A	N/A	U	TBD	TBD	TBD	U	TBD	TBD	TBD	U	TBD	N/A	TBD	U	TBD	TBD	TBD	U	TBD	TBD	TBD
M	900-5	902.3(4)	Planting Guidelines (Trees Planted on Conventional Highways)	Trees in the median shall be at least 100 feet from the longitudinal end of the median.	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	900-5	902.3(4)(a)	Planting Guidelines (Trees Planted on Conventional Highways)	The planting of large trees should be permitted on the roadside (excluding medians) with posted speeds of 35 miles per hour or less without curb or barrier, or with posted speeds of greater than 35 miles per hour with the following condition: • Trees should be planted at least 30 feet from the edge of traveled way.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	900-6	902.3(4)(b)	Planting Guidelines (Trees Planted on Conventional Highways)	The planting of large trees should be permitted on the roadside of convention highways (excluding medians) with posted speeds of 35 miles per hour or less with curb or barrier with the following conditions:	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	900-6	902.3(4)(c)	Planting Guidelines (Trees Planted on Conventional Highways)	The planting of large trees shall be permitted in medians with posted speeds of 35 miles per hour or less, only if the following conditions are met:	U	TBD	TBD	TBD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	900-6	902.3(4)(d)	Planting Guidelines (Trees Planted on Conventional Highways)	The planting of large trees shall be permitted in medians with posted speeds of less than 45 miles per hour, only if the following conditions are met:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	900-6	902.3(4)(e)	Planting Guidelines (Trees Planted on Conventional Highways)	The planting of large trees shall not be permitted in medians with posted speeds of greater than or equal to 45 miles per hour.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	900-11	903.5(1)	Site Preparation (Ingress and Egress)	Rest areas designed for freeways shall have standard freeway exit and entrance ramps, in accordance with Chapter 500.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A	900-18	904.3(1)	Design Features and Facilities (Road Connections)	The design of connections to vista points should be in accordance with Index 107.1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	900-18	904.3(1)	Design Features and Facilities (Road Connections)	Vista points designed for freeways shall have standard freeway exit and entrance ramps (see Chapter 500).	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-4	1003.1(1)	Class I Bikeways (Bike Paths)	The minimum paved width of the travel way for a two-way bike path shall be 8 feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-4	1003.1(1)	Class I Bikeways (Bike Paths)	The minimum paved width for a one-way bike path shall be 5 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-4	1003.1(1)	Class I Bikeways (Bike Paths)	A minimum 2-foot wide shoulder, composed of the same pavement material as the path or all weather surface, free of vegetation, shall be provided adjacent to the traveled way of the path when not on a structure.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-4	1003.1(2)	Class I Bikeways (Clearance to Obstructions)	A minimum 2-foot horizontal clearance from the paved edge of a bike path to obstructions shall be provided.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

CALTRANS DESIGN EXCEPTION CHECKLIST (for HDM dated 11-2-12)

I-605/Katella Ave Interchange Improvements PSR-PDS					M = Meets Design Std. V = Violates Design Std. (exception needed) N/A = Not Applicable U = Unknown (needs to be calc'd from topo) TBD = To Be Determined during PAED																							
M or A	HDM Page #	HDM Index	HDM Index Heading	Design Standard	Katella Avenue				NB Exit Ramps				NB Entrance Ramp				SB Loop Entrance Ramp				SB Direct Entrance Ramp				SB Loop Exit Ramp / C-D Ramp			
					Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4	Existing	Alt 2	Alt 3	Alt 4
A	1000-4	1003.1(2)	Class I Bikeways (Clearance to Obstructions)	3 feet should be provided.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-4	1003.1(2)	Class I Bikeways (Clearance to Obstructions)	The clear width of a bicycle path on structures between railings shall be not less than 10 feet.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-4	1003.1(2)	Class I Bikeways (Clearance to Obstructions)	The vertical clearance to obstructions across the width of a bicycle path shall be a minimum of 8 feet and 7 feet over shoulder.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-5	1003.1(6)	Class I Bikeways (Bike Paths Parallel and Adjacent to Streets and Highways)	The minimum separation between the edge of pavement of a one-way or two-way bicycle path and the edge of travel way of a parallel road or street shall be 5 feet plus the standard shoulder width. Bike paths within the clear recovery zone of freeways shall include a physical barrier separation.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-8	1003.1(7)	Class I Bikeways (Bike Paths in the Median of Highway or Roadway)	Bike paths shall not be placed in the median of State highways or roadways, especially freeways or expressways.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-8	1003.1(8)	Class I Bikeways (Bicycle Path Design Speed)	The design speed given in Table 1003.1 shall be the minimum.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-9	1003.1(10)	Class I Bikeways (Stopping Sight Distance)	The minimum stopping sight distance based on design speed shall be 125 feet for 20 miles per hour, 175 feet for 25 miles per hour and 230 feet for 30 miles per hour.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1000-10	1003.1(16)	Class I Bikeways (Entry Control for Bicycle Paths)	Fold-down obstacle posts or bollards shall not be used within the paved area of bicycle paths.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1100-2	1102.2 (1)	Noise Barrier Location (lateral Clearances)	Minimum lateral clearances to noise barriers shall be as provided in Topic 309.1, Horizontal Clearances, of this manual, but shall not be less than 10 feet.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M	1100-2	1102.2(1)	Noise Barrier Location (lateral Clearances)	When the lateral clearance is 15 feet or less, the noise barrier shall be placed on a safety shape concrete barrier.	N/A	N/A	N/A	N/A	M	M	M	M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## **Intersection Control Evaluation Memorandum**

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Attachment E

# MEMORANDUM

EA: 0K870K  
Caltrans Project Number: 1200020230

**To:** I-605/Katella Avenue Project Study Team  
**From:** Bo Burick, RBF Consulting  
**Date:** June 11, 2014  
**Subject:** I-605/Katella Avenue Interchange Improvement Project PSR-PDS  
Roundabout & Diverging Diamond Interchange Alternatives Disposition

---

## Introduction

The purpose of this memorandum is to perform a preliminary assessment of the viability of implementing the Roundabout and Diverging Diamond Interchange (DDI) improvement alternatives to the I-605/Katella Avenue interchange improvement project location.

## Purpose & Need and Alternative Evaluation Criteria

Purpose: The purpose of the project is to improve freeway access and arterial connection, improve interchange traffic operations, enhance safety, and improve pedestrian and bicycle facilities within the project limits while minimizing adjacent right of way, environmental, and economic impacts.

Need: The I-605/Katella Avenue interchange currently experiences congestion during peak periods and has existing geometric elements that do not provide needed optimal traffic operations. The interchange has a high concentration of congestion-related accidents. Also, the interchange currently has discontinuous facilities for both pedestrians and bicycle traffic.

Alternative Evaluation Criteria: The interchange is not experiencing poor traffic operational performance. The congestion noted in the Project Purpose is the result of queuing created by the closely spaced intersections between the I-605 northbound ramps and Los Alamitos Boulevard, which is approximately ½-mile in length. As such, the implementation of the Roundabout or DDI alternatives is not operationally necessary and the project improvement alternatives should primarily focus on reducing nonstandard geometric elements to address the high concentration of accidents and the improvement of pedestrian and bicycle facilities, which is a secondary objective of the project. This initial assessment of the Roundabout and DDI alternatives will consider the physical requirements of these alternatives relative to the specific constraints of the project and their ability to effectively meet the Purpose and Need. A traffic analysis of these alternatives is not proposed at this time.

A final consideration is the preservation of existing right of way, which is one of the key tenets of the Renewed Measure M (M2) Freeway Program. It has been the approach of the program to avoid right of way acquisition unless it is deemed necessary to meet the project Purpose and Need. This criterion is particularly critical with respect to the community of Rossmoor located in the southeast quadrant of the interchange.

### **Roundabout Interchange Improvement Alternative**

To the east of the interchange, Katella Avenue is a 106-ft wide eight-lane arterial with a 14-ft wide center median to accommodate turning movements. With four westbound/eastbound approach lanes, the configuration of a roundabout would be highly unconventional because roundabout intersections do not typically exceed three approach lanes. Further, the operational capacity of a roundabout will likely be exceeded due to the Average Daily Traffic (ADT) currently exceeding 27,000 vehicles in both directions. The ADT exceeds 30,000 by year 2050. To implement a roundabout intersection for this size of arterial, the footprint requires roadway widening for approximately 360-ft along the centerline of Katella Avenue and the roundabout itself would have a diameter in excess of 256-ft including center median and all lanes. At the northbound ramp intersection, the application of the roundabout is significantly constrained by the right of way boundary within the southeast quadrant of the interchange. If a roundabout were implemented at this location, the northbound off ramp would require realignment and the Caltrans right of way would require expansion into the backyard of three private residences and include the elimination/modification of a swimming pool. The alternative would also require removal of the northbound loop off-ramp bridge structure. On the west side of the interchange, the alternative footprint requirements would require modification of the open flood channel owned by the Orange County Flood Control District. Stage construction for this alternative would generate significant congestion throughout the construction phase.

### **Diverging Diamond Interchange (DDI) Alternative**

While this alternative may provide a benefit operationally, the following challenges would preclude its implementation for this project:

- To fully develop the DDI alternative, the roadway approaches require modification well beyond the ramp intersections to accommodate the through lane crossover. To implement a DDI ramp intersection for this size of arterial, the footprint requires roadway widening for approximately 460-ft along the centerline of Katella Avenue and the intersection itself would be in excess of 256-ft wide at its widest point including the center median and all lanes. Because of the necessary width of a DDI intersection at northbound ramp intersection, right of way acquisition would be required to accommodate realignment of the northbound off ramp and would involve the backyard of three private residences and include the elimination/modification of a swimming pool. The west side of the interchange is also constrained relative to the available footprint to

accommodate the increased width of a DDI intersection for the southbound ramp intersection. The DDI alternative would require modification of the open flood channel owned by the Orange County Flood Control District. Stage construction for this alternative would be highly challenging due to the through lane crossover and generate significant congestion throughout the construction phase.

- The DDI is an uncommon design in southern California and, as such, presents possible unknown challenges to driver operation, and the safe accommodation of pedestrians and bicyclists. Providing for pedestrian and bicycle traffic through the interchange is an important element of the project Purpose and Need.

## **Conclusion**

It is recommended the Project Study Team remove these interchange improvement alternatives from further consideration with the following justification:

- Significant right of way acquisition;
- Significant increase in project cost for right of way acquisition, which would exceed the funding constraints of the M2 budget for this project;
- Right of way acquisition would potentially generate project controversy;
- Negligible operational benefit;
- Significant congestion through construction staging; and
- Inconsistent with the project Purpose and Need.



## **Conceptual Cost Estimate – Right-of-Way Component**

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Attachment F

**CONCEPTUAL COST ESTIMATE – RIGHT OF WAY COMPONENT**

To: Evangelina Washington  
 Branch Chief – R/W Planning & Mgmt

Date: October 2014

From: Trisha Keith  
 RBF Consulting

12-Ora-605 – PM 1.1/ 1.6  
 Project ID 12000020230  
 EA 0K870K  
 I-605/Katella Ave  
 Interchange Improvements

A Field Review was conducted  Yes  No

**Scope of the Right of Way**

The three build alternatives will require approximately 0.04 acres of right of way on the north side of Katella Avenue. The resulting acquisition will not impact existing buildings and will be the responsibility of the City of Los Alamitos. No change to Caltrans right of way is anticipated.

Right of Way Required  Yes  No  
 Number of Parcels  1-10  11-25  26-50  51-100  >100  
 Urban  Rural  
 Land Area: Fee 0.04 ac Easement 0.12-0.22 ac (Encroachment Permit)  
 Displaced Persons/Businesses  Yes  No  
 Demolition/Clearance  Yes  No  
 Railroad Involvement  Yes  No  
 Utility Involvements  Yes  No 9 Number of Utilities in area

**Cost Estimates**

Support Costs	<input checked="" type="checkbox"/> \$0-\$25,000	<input type="checkbox"/> \$500,001-\$1,000,000
	<input type="checkbox"/> \$25,001-\$100,000	<input type="checkbox"/> \$1,000,001-\$5,000,000
	<input type="checkbox"/> \$100,001-\$250,000	<input type="checkbox"/> \$5,000,001-\$10,000,000
	<input type="checkbox"/> \$250,001-\$500,000	<input type="checkbox"/> >\$10,000,000
Capital Costs	<input type="checkbox"/> \$0-\$100,000	<input type="checkbox"/> \$5,000,001-\$15,000,000
	<input checked="" type="checkbox"/> \$100,001-\$500,000	<input type="checkbox"/> \$15,000,001-\$50,000,000
	<input type="checkbox"/> \$500,001-\$1,000,000	<input type="checkbox"/> \$50,000,001-\$100,000,000
	<input type="checkbox"/> \$1,000,001-\$5,000,000	<input type="checkbox"/> >\$100,000,000

**Schedule**

Right of Way will require 12 months to deliver a Right of Way Certification #1 from Final R/W Maps. This estimate is based on a Right of Way Certification date of 12/2029.

## **Areas of Concern**

On the south side of Katella Avenue, improvements would be located within an existing OC Flood easement. While it is expected that an agreement would be needed between the County and the City of Los Alamitos to address physical improvements and long term maintenance, no formal right of way acquisition is anticipated.

## **Assumptions and Limiting Conditions**

The right-of-way line assumed for the PSR-PDS phase was located using GIS parcel data. Visual improvements on an aerial photograph were used to corroborate and modify the resulting right-of-way line.

## **Contact**

Trisha Keith, P.E.  
RBF Consulting  
(949) 472-3505








**Utility Map**

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Attachment G



**LEGEND**

-  **ELECTRIC POWER**
-  **ELECTRIC POWER (OH)**
-  **GAS, OIL**
-  **COMMUNICATIONS (PHONE & CABLE)**
-  **WATER**
-  **SEWER**
-  **CALTRANS RIGHT OF WAY**

**Preliminary Environmental Analysis Report (PEAR)**

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Attachment H



# PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT

## 1. Project Information

District 12	County Orange	Route 605	PM 1.1/1.6	EA 0K870K
Project Title: Interstate 605/Katella Avenue Interchange Improvements				
Project Manager Mike Varipapa, P.E.			Phone # (949) 756-7607	
Project Engineer RBF Consulting - Trisha Keith, P.E.			Phone # (949) 855-7049	
Environmental Office Chief/Manager Smita Deshpande			Phone # (949) 724-2245	
PEAR Preparer RBF Consulting - Alan Ashimine			Phone # (949) 855-5710	

## 2. Project Description

### Need and Purpose

The Orange County Transportation Authority (OCTA), in cooperation with the California Department of Transportation (Caltrans) District 12 and the City of Los Alamitos, proposes to improve the local interchange at Interstate 605 (I-605) and Katella Avenue to improve freeway access and arterial connection, improve interchange traffic operations, enhance safety, and improve pedestrian and bicycle facilities within the interchange area.

### Need

The I-605/Katella Avenue interchange currently experiences congestion during peak periods and has existing geometric elements that do not provide needed optimal traffic operations. The interchange has a high concentration of congestion-related accidents and the interchange currently has discontinuous facilities for both pedestrians and bicycle traffic.

### Purpose

The purpose of the project is to improve freeway access and arterial connection, improve interchange traffic operations, enhance safety, and improve pedestrian and bicycle facilities within the project limits while minimizing adjacent right of way, environmental, and economic impacts.

## **Description of Work**

The I-605/Katella Avenue interchange (proposed project site) is located in the western portion of Orange County, within the City of Los Alamitos; refer to [Figure 1, \*Regional Vicinity Map\*](#). The project site is located along Katella Avenue within the western portion of the City, between the City's westerly boundary to the west and Civic Center Drive to the east; refer to [Figure 2, \*Site Vicinity Map\*](#).

### Project Alternatives

Four alternatives were analyzed for the project: a no build alternative and three build alternatives. Each of the build alternatives includes modifications to interchange ramps and Katella Avenue. The existing I-605 mainline would not be modified, with the exception of the northbound #4 lane at the northbound exit ramp. It would be restriped to provide a through lane/ramp exit option. Katella Avenue would be widened and lane geometries would be modified to provide full standard lanes and shoulders through the interchange and to tie in with proposed ramp improvements. The project would not widen Katella Avenue beyond the project limits. Proposed modifications to the northbound ramps and Katella Avenue east of the northbound ramps are similar in all three build alternatives.

In the three build alternatives, impacts would occur to existing facilities within the interchange and along Katella Avenue from the bridge over Coyote Creek Channel to Civic Center Drive. It is anticipated that right of way acquisition would be required along the north side of Katella Avenue from the interchange to the study area limits, to accommodate the proposed improvements. Widening on the south side of Katella Avenue would occur within an existing OC Flood easement. No other permanent right of way acquisitions are anticipated. Additional details of each alternative are provided below.

#### *Alternative 1 - No Build Alternative*

Under this alternative, no reconstruction or improvements would be made to the existing I-605/Katella Avenue interchange other than routine roadway maintenance and currently approved improvements.

#### *Alternative 2 - Northbound Ramps Modifications*

This alternative would focus on improvements to the northbound interchange ramps and Katella Avenue; refer to [Figure 3a, \*Alternative 2 – Northbound Ramps Modifications\*](#) for the proposed interchange layout.

On westbound Katella Avenue, improvements would begin at Civic Center Drive, where the existing lanes and shoulders would be widened to standard widths. The ramp termini of the northbound entrance and loop exit ramps would be reconfigured to eliminate the existing free right turn movements and the short entrance ramp merge. The No. 4



westbound lane would transition to a right turn lane at the intersection, creating a trap lane similar to existing conditions, but without the high-speed right turn movement onto the ramp. The resulting signalized tee-intersection would provide a shorter crossing and better visibility for pedestrians and bicyclists. It would also extend the distance between the northbound loop exit and southbound loop entrance ramps and reduce the severity of the weave between the No. 2 and No. 3 lanes. Continuing west on Katella Avenue, the existing left-hand merge of the No. 1 and No. 2 lanes would be eliminated, and the three through lanes would transition to two through lanes and a right turn lane for the southbound loop entrance ramp. This would again create a trap lane, for which proper advance signing would be provided. The terminus of the southbound loop entrance ramp would be modified to provide a smooth transition and continuous standard outer shoulder from Katella Avenue onto the ramp. Beyond the southbound loop entrance ramp, westbound Katella Avenue would continue with two standard lanes and standard shoulders until they taper to match existing widths at the Coyote Creek bridge. Standard sidewalk and curb ramps would be constructed along the length of improvements along westbound Katella Avenue.

On eastbound Katella Avenue, improvements would begin at the existing access road adjacent to Coyote Creek Trail, where sidewalk and curb and gutter would be added from the access point to the existing southbound direct entrance ramp pedestrian crossing. At the southbound loop exit ramp terminus, a third through lane would be added to Katella Avenue to eliminate the existing abrupt lane merge, and a standard outer shoulder would be added. Continuing east, the terminus of the northbound exit ramp would be modified to join Katella Avenue as a fourth lane, replacing the existing two-lane addition. In the median, the existing eastbound left turn pocket to the northbound entrance ramp would be lengthened to the greatest extent feasible without impacting existing bridge columns. Beyond the northbound ramps, Katella Avenue would continue east with four standard lanes and standard shoulders until they taper to match existing widths at Civic Center Drive. Standard sidewalk and curb ramps would be constructed along the length of proposed roadway improvements along eastbound Katella Avenue, and would tie into existing sidewalks to remain.

The northbound exit ramp would be widened at the I-605 mainline to provide two lanes for high exit volumes. The No. 4 general purpose lane would be restriped from a through lane to an option lane, where vehicles could exit to the No. 1 lane on the ramp. The existing auxiliary lane would exit to the No. 2 lane on the ramp. The exit ramp would be widened from the mainline to the existing divergence point, where the loop ramp continues to westbound Katella Avenue/Willow Street and the direct ramp continues to eastbound Katella Avenue. All widening would take place along the inside edge of the ramp, so the existing retaining wall and sound wall along the outside edge of shoulder could be protected in place. The overhead freeway sign located at the northbound exit ramp divergence point would be modified to reflect the new exit lane configuration. Freeway signage upstream of the ramp would also be modified as needed to provide proper advance guidance. No bridges or retaining walls would be modified or constructed as part of Alternative 2.

Existing traffic signals at the intersections of Katella Avenue at the northbound ramps and Civic Center Drive would be modified to accommodate changes to intersection geometries and lane configurations.

### *Alternative 3 - Remove Southbound Loop On Ramp*

This alternative would include improvements to the northbound ramps and Katella Avenue east of the northbound ramps as described in Alternative 2, above. To the west of the northbound ramps, this alternative would remove the southbound loop entrance ramp; refer to [Figure 3b](#), *Alternative 3 – Remove Southbound Loop On Ramp* for the proposed interchange layout.

On westbound Katella Avenue, improvements would begin at Civic Center Drive and continue to the northbound ramps with improvements similar to those described in Alternative 2. Continuing west on Katella Avenue, the existing left-hand merge of the No. 1 and No. 2 lanes would be eliminated, and the three through lanes would transition to two through lanes and a left turn lane for the southbound direct entrance ramp. This would create a trap lane, which would be signed accordingly. A second left turn lane would be added as a turn pocket in the median, west of the existing bridge columns. The addition of left turn lanes on westbound Katella Avenue would provide access to southbound I-605 currently served by the existing southbound loop entrance ramp. As a result, the loop entrance ramp would be removed, thereby eliminating the right turn conflict between pedestrians, bicyclists, and vehicles along westbound Katella Avenue at this location. Beyond the southbound entrance ramp, westbound Katella Avenue would continue with two standard lanes and standard shoulders until they taper to match existing widths at the bridge. Standard sidewalk and curb ramps would be constructed along the length of improvements along westbound Katella Avenue.

Removal of the southbound loop entrance ramp, described above, would eliminate use of the southbound C-D ramp by vehicles entering the southbound I-605 mainline from Katella Avenue. As a result, the C-D ramp would be restriped as a single lane facility, joining the mainline to the existing loop exit ramp only, with no weave or merge. The portion of the C-D ramp between the existing loop exit and direct entrance ramps would be removed to preclude use of the C-D ramp as a mainline bypass.

On eastbound Katella Avenue, improvements would begin at the existing access road adjacent to Coyote Creek Trail, where existing lanes and shoulders would be widened to standard widths. A right turn lane would be added in advance of the southbound entrance ramp to reduce conflicts between eastbound through and right turn movements. The terminus of the southbound direct entrance ramp would be modified to accept vehicles from the eastbound right turn lane and dual westbound left turn lanes. As a result, the ramp would have three lanes and would be widened over much of its length to provide a standard taper from three lanes to one lane before it joins the mainline. Continuing east, a third through lane would be added to Katella Avenue at the terminus of the southbound loop exit ramp, to eliminate the existing abrupt lane merge. Following the lane addition, proposed improvements would continue to Civic Center Drive, similar to those described

in Alternative 2. Sidewalk would be constructed along eastbound Katella Avenue from the westerly project limit to the southbound entrance ramp, where a crossing to the north side of Katella Avenue would be provided. Existing sidewalk would be removed from the southbound entrance ramp to Civic Center Drive.

The northbound exit ramp would be widened at the I-605 mainline to provide two lanes for high exit volumes, as described in Alternative 2.

No bridges would be modified or constructed as part of Alternative 3. A retaining wall would be required along much of the southbound direct entrance ramp widening to avoid right of way impacts. This wall has been assumed as a Type 1 retaining wall on spread footing for preliminary cost purposes.

A new signal would be provided at the intersection of Katella Avenue and the southbound entrance ramp to accommodate westbound left turn movements onto the ramp and a pedestrian crossing on the west leg of the intersection. Modifications to existing traffic signals at the intersections of Katella Avenue at the northbound ramps and Civic Center Drive would be needed to accommodate changes to intersection geometries and lane configurations.

#### *Alternative 4 - Southbound Ramps Braid*

This alternative would include improvements to the northbound ramps and Katella Avenue east of the northbound ramps as described in Alternative 2, above. To the west of the northbound ramps, this alternative would braid the southbound ramps; refer to Figure 3c, *Alternative 4 - Southbound Ramps Braid* for the proposed interchange layout.

On westbound Katella Avenue, improvements would begin at Civic Center Drive and continue to the northbound ramps with improvements similar to those described in Alternative 2. Continuing west on Katella Avenue, the existing left-hand merge of the No. 1 and No. 2 lanes would be eliminated, and the three through lanes would transition to two through lanes and a right turn lane for the southbound loop entrance ramp. This would create a trap lane, for which proper advance signing would be provided. The southbound loop entrance ramp would be reconstructed, as described below. Beyond the southbound loop entrance ramp, Katella Avenue would continue with two standard lanes and standard shoulders until they taper to match existing widths at the Coyote Creek bridge. Standard sidewalk and curb ramps would be constructed along the length of improvements along westbound Katella Avenue.

On eastbound Katella Avenue, improvements would begin at the existing access road adjacent to Coyote Creek Trail, where existing lanes and shoulders would be widened to standard widths. A right turn lane would be added in advance of the southbound entrance ramp to reduce conflicts between eastbound through and right turn movements. The termini of the southbound direct entrance and loop exit ramps would be reconstructed with free-right movements as part of ramp reconfigurations described below. Continuing east, a third through lane would be added to Katella Avenue at the terminus of the

southbound loop exit ramp, to replace the existing abrupt lane merge. Following the lane addition, proposed improvements would continue to Civic Center Drive, similar to those described in Alternative 2. Standard sidewalk and curb ramps would be constructed along the length of improvements along eastbound Katella Avenue, and would tie into existing sidewalk near Civic Center Drive.

On the west side of the interchange, the three southbound ramps would be reconstructed. Both entrance ramp alignments would be modified to separate them from the existing southbound C-D ramp and eliminate the associated weave and merge. The southbound loop exit ramp would also be reconstructed, and would tie into the existing C-D ramp south of the Katella Avenue bridge. Similar to Alternative 3, the C-D ramp would be restriped as a single lane exit facility, joining the southbound loop exit ramp only. The portion of the C-D ramp between the existing loop exit and direct entrance ramps would be removed to preclude use of the C-D ramp as a mainline bypass. Conceptual profiles and superelevation diagrams have been prepared for the three southbound ramp realignments based on limited information from interchange as-builts.

As described in Alternative 2, the northbound exit ramp would be widened at the I-605 mainline to provide two lanes for high exit volumes.

New bridge structures would be required for the realigned southbound loop entrance ramp crossings over Katella Avenue and the realigned loop exit ramp. Based on available data, it is assumed that both bridges would be pre-stressed concrete cast-in-place boxes.

The portion of the existing C-D road south of Katella Avenue would be reconstructed at a lower elevation to join the new southbound loop exit ramp. This reconstruction would require a retaining wall between the I-605 southbound mainline and the reconstructed ramp. For cost planning purposes, this wall has been assumed to be a tie back retaining wall. Retaining walls would also be needed along the southbound direct entrance ramp to accommodate vertical differentials with the southbound loop exit ramp and to avoid right of way acquisitions. Estimated costs for these walls were based on Type 1 retaining walls on spread footings.

The existing traffic signals at the intersections of Katella Avenue at the northbound ramps and Civic Center Drive would be modified to accommodate changes to intersection geometries and lane configurations.

### Project Construction

The proposed project is expected to be constructed as a single phase, with the following estimated duration for each alternative:

- 12 months for Alternative 2;
- 18 months for Alternative 3; and
- 24 months for Alternative 4.

The proposed project would require access and staging areas to allow for construction activities and the storage of equipment. It is expected that these areas would occur within or immediately adjacent to the proposed interchange improvements to minimize the impact area associated with the project. Specifics regarding the location and area of staging and access roads would be determined as part of the Project Approval/Environmental Document (PA/ED) phase, and these areas will require analysis within the environmental document.

In addition, based on initial utility information, the proposed project may impact the following utilities:

- Cable – Time Warner
- Electricity – Southern California Edison, Clear Channel Outdoor
- Gas – Southern California Gas, Long Beach Gas and Oil
- Oil – Plains All American Pipeline
- Sewer – Rossmoor/Los Alamitos Sewer District
- Water – Golden State Water Company
- Wireless – Verizon Wireless

It should be noted that nonstandard features have been identified in the proposed alternatives based on post May 7th, 2012 Caltrans Highway Design Manual (HDM) 6th Edition standards. A detailed description of the nonstandard features associated with the project is provided within Section 7.5, Nonstandard Features, of the PSR-PDS.





NOT TO SCALE



08/14 • JN 136149

PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT  
I-605/KATELLA AVENUE INTERCHANGE IMPROVEMENTS

## Site Vicinity Map

Figure 2

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NOT TO SCALE



07/14 • JN 136149

PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT  
I-605/KATELLA AVENUE INTERCHANGE IMPROVEMENTS

## Alternative 2 – Northbound Ramps Modification

Figure 3a

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PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT  
I-605/KATELLA AVENUE INTERCHANGE IMPROVEMENTS

**Alternative 4 – Southbound Ramps Braid**

**Figure 3c**

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### 3. Anticipated Environmental Approval

Check the anticipated environmental determination or document for the proposed project in the table below.

CEQA		NEPA	
<b>Environmental Determination</b>			
Statutory Exemption	<input type="checkbox"/>		
Categorical Exemption	<input type="checkbox"/>	Categorical Exclusion	<input type="checkbox"/>
<b>Environmental Document</b>			
Initial Study or Focused Initial Study with proposed Negative Declaration (ND) or Mitigated ND	<input checked="" type="checkbox"/>	Routine Environmental Assessment with proposed Finding of No Significant Impact	<input checked="" type="checkbox"/>
		Complex Environmental Assessment with proposed Finding of No Significant Impact	<input type="checkbox"/>
Environmental Impact Report	<input type="checkbox"/>	Environmental Impact Statement	<input type="checkbox"/>
CEQA Lead Agency (if determined):	Caltrans		
Estimated length of time (months) to obtain environmental approval:	24 months		
Estimated person hours to complete identified tasks:	650		

Caltrans will be the lead agency under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) (Under the NEPA authority assigned to Caltrans by the U.S. Department of Transportation in Memorandum of Understanding 23 USC 326 and 23 USC 327 [effective October 1, 2012]).

The anticipated environmental document for the proposed project is an Initial Study (IS) leading to a Mitigated Negative Declaration (MND) under the California Environmental Quality Act (CEQA) and a Routine Environmental Assessment (EA) leading to a Finding of No Significant Impact (FONSI) under the National Environmental Policy Act (NEPA).

### 4. Special Environmental Considerations

The preliminary impact area associated with the Build Alternatives is reviewed within this document. In general, special considerations include any special processes and/or seasonal constraints that may affect project delivery and require unusual, exceptional, or extended environmental processes.

For the proposed project, special environmental considerations may include the need for construction monitoring for cultural resources or biological resources (as required under the Migratory Bird Treaty Act). Though it is not expected that impacts to jurisdictional waters of the U.S. and State would occur, additional investigation would be required to

confirm this finding and determine whether permits from the U.S. Army Corps of Engineers (ACOE), State Water Resources Control Board (SWRCB), and California Department of Fish and Wildlife (CDFW) would be required. If any of these activities are deemed necessary, there is a potential that the environmental process may be extended. The requirement for these potential permits, approvals, and consultations would be determined as part of project-specific field investigations and technical analyses to be performed during the PA/ED phase.

## **5. Anticipated Environmental Commitments**

The following is a list of possible avoidance, minimization, and/or mitigation measures that could be required for the purposes of this proposed project, under all Build Alternatives.

1. If human remains are encountered during construction, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code (PRC) Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be Native American, the County Coroner will notify the Native American Heritage Commission (NAHC), who will determine and notify the Most Likely Descendant (MLD). The MLD may inspect the site of the discovery with the permission of the land owner, or his/her authorized representative. The MLD shall complete the inspection within 48 hours of being granted access to the site.
2. If historic or archaeological resource materials are discovered during construction, all earth-moving activity within a minimum 50-foot radius around the discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
3. If any paleontological resources are encountered during construction activities, all ground disturbing activities within a minimum 50-foot radius shall stop until the services of a qualified paleontologist can be retained to identify and evaluate the resources and, if necessary, recommend mitigation measures to document and preserve the resources.
4. If ground disturbing activities are scheduled to commence during the raptor breeding season (February 1 through August 31), pre-construction raptor surveys shall be conducted by a qualified biologist in order to identify possible nesting activity. A construction-free buffer of suitable dimensions must be established around any active raptor nests (up to 250 feet, depending on the nest location and species) for the duration of the project or until it has been determined that the chicks have fledged and are independent of their parents.
5. If unknown wastes or suspect materials are discovered during construction by the contractor, which he/she believes may involve hazardous waste/materials, the contractor shall:



- a. Immediately stop work in the vicinity of the suspected contaminant, removing
  - b. workers and the public from the area;
  - c. Notify the project engineer of the implementing agency;
  - d. Secure the areas as directed by the project engineer; and
  - e. Notify the implementing agency's Hazardous Waste/Materials Coordinator.
6. A Phase II/Site Characterization Specialist shall conduct sampling along the subject site in order to determine whether or not contamination exists in association with aerially deposited lead. Results of the sampling would indicate the level of remediation efforts that may be required, if necessary.
7. If demolition/modification of bridge structures are to occur for the project, asbestos testing shall be conducted at the time of demolition/modification by a certified specialist. If asbestos is present, the certified asbestos abatement specialist shall monitor the disposal of the asbestos containing materials as they are uncovered.
8. Should construction activities result in demolition or modification of bridge structures, the generated waste should be disposed of at an appropriate, permitted disposal facility as determined by a lead specialist.
9. For construction activities resulting in the disturbance of traffic striping materials, the generated wastes shall be disposed of at an appropriate, permitted disposal facility as determined by a lead specialist.
10. Prior to site disturbance, the Resident Engineer shall require the contractor to notify Underground Service Alert (USA) at least two days prior to excavation by calling 811 to ensure that all utility owners within the project disturbance limits identify the locations of underground transmission lines and facilities.
11. Any transformer to be relocated/removed during site construction/demolition shall be conducted under the purview of the local purveyor to identify property-handling procedures regarding PCBs.
12. In compliance with Executive Order (EO) 13112, Invasive Species, and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in, or adjacent to, the construction areas. These include the inspection and clearing of construction equipment and eradication strategies to be implemented should an invasion occur.
13. Where landscaping is proposed, the project shall install landscaping that is compatible with the existing landscaping. All selected plant species within the roadway right-of-way shall share similar water requirements. The new landscaping concept and plant palette shall be determined and approved by Caltrans District Landscape Architect.
14. In compliance with the Caltrans National Pollutant Discharge Elimination System (NPDES) Permit (Order No. 2012-0011-DWQ), water quality treatment of runoff

from new impervious areas or the equivalent within project limits will be implemented per the Project Planning and Design Guide.

The environmental commitments cited above are considered standard construction provisions. Additional commitments will be required and would be determined as part of the PA/ED phase.

## 6. Permits and Approvals

The following table identifies the anticipated permits and approvals required for the proposed project. These permits and approvals are subject to change based upon project-specific field investigations and technical analyses to be performed during the PA/ED phase.

Permit/Approval	Agency	Notes
NPDES Construction General Permit	SWRCB	Required for short-term construction related water quality impacts.
Caltrans Statewide NPDES Permit	SWRCB	The Caltrans Statewide NPDES Permit all discharges from Caltrans municipal separate storm sewer system (MS4) facilities.
Encroachment Permit	Caltrans District 12	Required for field surveys and construction activities.
Encroachment Permit	City of Los Alamitos	Required for field surveys and construction activities.
Encroachment Permit	Los Angeles County Flood Control District	Required for field surveys and construction activities.
Encroachment Permit	Orange County Flood Division	Required for field surveys and construction activities.

## 7. Level of Effort: Risks and Assumptions

The environmental factors that could affect cost and schedule for this proposed project include the anticipated permit processes (NPDES/SWPPP approvals through the Santa Ana RWQCB and encroachment permits). Other factors include the need for additional technical studies, or the identification of cultural or biological resources resulting in unanticipated mitigation requirements. The environmental document would be prepared based on technical studies completed and approved for the proposed project, as well as any additional studies in the vicinity. For this proposed project, special considerations may entail resource agency permits, the potential for hazards/hazardous materials within the proposed project limits, and the potential need for cultural and/or biological monitoring during construction.

## 8. PEAR Technical Summaries

**8.1 Land Use:** The proposed project site is located within the City of Los Alamitos. As a roadway facility, the existing interchange does not have a land use or zoning designation based on the City's *General Plan Land Use Map* and *Zoning Map*, respectively. However, the project site is surrounded by areas with a *General Plan* land use designation of General Office (to the northeast), Single Family Residential

(to the southeast), and Public/Quasi Public Facility (to the northwest and southwest). In addition, the site is surrounded by areas with a zoning designation of Commercial-Professional Office (to the northeast), Single-Family Residence (to the southeast), and Open Area (to the northwest and southwest).

Land use compatibility and consistency with the land use and zoning designations will be evaluated during PA/ED. A separate technical study is not required.

- 8.2 Growth:** The purpose of the project is to improve freeway access and arterial connection, improve interchange traffic operations, enhance safety, and improve pedestrian and bicycle facilities within the project limits. No residences or businesses would be introduced as a result of this proposed project; therefore, a direct increase in population is not anticipated. The project site and surrounding area is highly urbanized and built-out, and would not be considered growth inducing. A separate technical study is not required.
- 8.3 Farmlands/Timberlands:** Based on the City's *General Plan* and *Zoning Code*, there are no farmland land use or zoning designations within the project limits or within the vicinity. No timberlands are identified within or adjacent to the proposed project. In addition, according to the California Department of Conservation's 2010 map denoting *Orange County Important Farmland*, the project site is designated as Urban and Built Up Land. As such, a separate technical study is not required.
- 8.4 Community Impacts:** The proposed project area can be characterized as urban in nature. The area within or adjacent to the project site consists of existing roadway facilities, offices and single family residences to the east, single family residences to the south, and open space and the Coyote Creek Channel to the west. Due to the existing nature of the I-605/Katella Avenue interchange, and the existence of adjacent roadway facilities (Katella Avenue and Willow Street), the project would not divide an existing community.

All build alternatives would require right of way acquisition from the northern side of Katella Avenue between the existing interchange and the study area limits. Right of way acquisition at this location is not expected to be controversial, given the small area affected and the fact that the proposed widening of westbound Katella Avenue would encroach only into the landscaped area. As such, a separate technical study is not required.

- 8.5 Visual/Aesthetics:** The project is not on, or adjacent to, an officially-designated state scenic highway, according to the Caltrans California Scenic Highway Mapping System. A segment of State Route 91 (SR-91) is the nearest officially-designated scenic highway, which is located approximately 15 miles east of the project site. Visual resources are often subjective in nature and therefore analysis is completed per the Federal Highway Administration (FHWA) Visual Impact Assessment for Highway Project Guidelines. This screening is done pursuant to the Caltrans Standard Environmental Reference (SER), discusses the project area, and

provides mitigation if necessary. The project would result in improvements to existing roadway facilities in an urbanized area. Proposed improvements are not expected to result in a substantial change in the aesthetic character of the project area. Based on Alternative 4, two new bridge structures would be required for the realigned southbound loop entrance ramp crossings over Katella Avenue and the realigned loop exit ramp. While these improvements would result in the development of new structures within project site limits, they would be compatible with the mass and scale of existing transportation infrastructure along Katella Avenue (i.e., the existing I-605 overpass) and other development in the vicinity, and would not substantially change the aesthetic character of the area. Moreover, there are no identified scenic resources or vistas in the project area, based upon the City's General Plan. As such, a separate technical study is not required.

**8.6 Cultural Resources:** Based on analysis provided within the *Cultural Resources Constraints for the I-605/Katella Avenue Interchange Project* (Cogstone Resource Management, August 2014), no archaeological sites are known within the project site; however, one prehistoric isolate, consisting of eight shell beads, has been recorded within a one-mile radius of the project boundaries. In addition, 70 historic built environment resources were identified, including two transmission towers, two school complexes, and 66 single-family houses from the 1950s and 1960s. One built environment resource, P-30-177412 Oak Middle School, is located in the immediate vicinity of the project site. This resource has been determined ineligible for the National Register of Historic Places (NRHP) by consensus through Section 106 process. A Historic Resources Evaluation Report (HRER) is not recommended because the one built resource located closest to the project area has already been evaluated and determined ineligible for listing on the NRHP. However, a Historic Property Survey Report (HPSR) with Archaeological Survey Report (ASR) will be prepared during PA/ED to further analyze impacts to archaeological resources.

**8.7 Hydrology and Floodplain:** According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), the project site is located in Zone X, a zone designated as having a 0.2% annual chance of flood. Hydrological conditions within the project area and drainage facilities that would be included as part of the project will be further analyzed during PA/ED. A separate technical study is not required for the project.

**8.8 Water Quality and Storm Water Runoff:** The proposed project is within the jurisdiction of the Santa Ana RWQCB. It must conform to Caltrans' existing Statewide National Pollutant Discharge Elimination System (NPDES) Permit and to the existing State Water Resources Control Board (SWRCB) General NPDES Permit for Construction Activities.

The project has the potential to result in short-term construction related impacts (e.g., erosion due to exposed soils on-site and pollutants from construction equipment). Coverage under the SWRCB Construction General Permit would be required since the proposed project has a soil disturbance area greater than one acre.

The SWPPP shall incorporate control measures for soil stabilization, sediment control, wind erosion control, waste management, and disposal control practices to minimize these potential construction-related impacts.

The project would also have the potential to result in long-term operational water quality impacts. The project would result in a minor increase in impervious area, and the project may result in increased pollutant and sediment loads. Caltrans' Statewide Storm Water Management Plan requires project development personnel to assess the need for storm water Best Management Practices (BMPs) and incorporate these BMPs as appropriate during the initial planning and design phases for all Caltrans projects. The project meets criteria for treatment BMPs as it is a reconstruction of the existing interchange and will: 1) change line and grade; and 2) drains to a water body with an established Total Maximum Daily Load (TMDL). A Project Initiation Document (PID) phase Storm Water Data Report (SWDR) has been prepared for the project to assess potential BMPs. According to the SWDR, the project's treatment BMP strategy will be determined at a later stage of design when more technical information is available; however, there is potential for Biofiltration Swales, Detention Basins, and Media Filters to reduce impacts during long-term project operations. The SWDR will be updated during PA/ED. During the PA/ED phase, water quality impacts will be evaluated based on the existing water quality (impaired water bodies, TMDLs, pollutant stressors, etc.) at the project site and potential impacts from the proposed project. Based on that evaluation, this will determine if a Water Quality Assessment Report (WQAR) will need to be prepared to evaluate the impacts to water quality. If impacts to water quality are minimal, a Water Quality Technical Memorandum (WQTM) can be prepared in place of a WQAR.

**8.9 Geology, Soils, Seismic and Topography:** The project site is located within a seismically active area, in proximity to several known earthquake faults, including the Newport-Inglewood, Norwalk, El Modena, Whittier-Elsinore, and Elysian Park Faults. Thus, the proposed project may be subject to ground shaking due to seismic events. The site may also be susceptible to other geologic conditions such as liquefaction or unstable soils. To further analyze the potential for these impacts, a Geotechnical Design Report will be prepared during the PA/ED phase.

**8.10 Paleontology:** Based on analysis provided within the *Cultural Resources Constraints for the I-605/Katella Avenue Interchange Project* (Cogstone Resource Management, August 2014), no fossil localities are known within the project site. However, there are localities near the project area from sedimentary deposits similar to those that occur at depth within the project boundaries. All recorded vertebrate fossil localities near to the project site are from the older Quaternary deposits. Specimens recovered include rays, sharks, bony fish, turtle, birds, sea otter, camels, dog, gopher, horse, and mammoth. As such, a Paleontological Identification and Evaluation Report (PIR/PER) will be required for the project during PA/ED.

**8.11 Hazardous Waste/Materials:** The analysis of existing hazardous waste/materials is based upon the *Phase I Initial Site Assessment (ISA) for the I-605/Katella Avenue Interchange*, dated August 2014, prepared by RBF Consulting. The ISA included a review of historical and regulatory hazardous materials information/databases, interviews with key site personnel/property owners, and a field review of on-site conditions. Based on this analysis, I-605 was constructed in 1966 and it is anticipated that I-605, in the vicinity of the subject site, has been utilized by a high volume of traffic since then. The potential for lead contamination to exist within exposed soils on-site due to aerially deposited lead is likely. Therefore, the Phase I ISA has revealed evidence of a recognized environmental condition (REC) on the subject site as a result of aerially deposited lead.

In addition, although the ISA has determined that the following conditions do not constitute RECs, the ISA identifies concerns related to asbestos containing materials (ACMs), lead-based paints (LBPs), traffic striping materials, petroleum pipelines known to occur in the project area, and polychlorinated biphenyls (PCBs). As such, recommendations included in the ISA will be considered as part of PA/ED.

**8.12 Air Quality:** The proposed project is located within the South Coast Air Basin (SCAB), which is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAB is in attainment of most of the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS); however the SCAB is in nonattainment for the following pollutants (Federal standards):

- Ozone (O<sub>3</sub>); and
- Particulate matter 2.5 microns in diameter or less (PM<sub>2.5</sub>).

It should be noted that particulate matter 10 microns in diameter or less (PM<sub>10</sub>) was redesignated to maintenance in June 2013. The project is not exempt from the requirement to determine conformity. It does not fall under the category of exempt projects listed in Table 2 of 40 CFR 93.126 (Table 1 and 2 of the CO Protocol). However, it is exempt from regional emissions analyses (Table 3 of 40 CFR 93.127) as “Interchange reconfiguration projects”. Furthermore, the project does not qualify under CE assignment 23 USC 326. Due to the project’s potential to affect roadway capacity and truck volumes, it may be determined to be a Project of Air Quality Concern (POAQC) by the Transportation Conformity Working Group (TCWG). However, interagency consultation with the TCWG would be required for a formal determination as part of the PA/ED phase. Therefore, an Air Quality Assessment Report (AQAR) as well as an Air Quality Conformity Report and Transportation Air Quality Conformity Checklist are required for the project.

**8.13 Noise and Vibration:** The proposed project would improve operation and safety of Katella Avenue and the I-605/Katella Avenue interchange by relieving existing congestion and improving efficiency. Currently, the closest existing noise receptor

is a residence located approximately 130 feet to the south of the interchange; additional residences are located along the I-605/Katella northbound off-ramp and Katella Avenue, in the vicinity of the proposed roadway improvements. Since the project meets the definition of a Type I project under the Caltrans Traffic Noise Analysis Protocol (TNAP), it is assumed that a TNAP Analysis will be required for all alternatives based on the surrounding sensitive receptors. A detailed Noise Study Report (NSR) will be conducted, and prior to the NSR, the consultant will first obtain approval of a Noise Study Work Plan from Caltrans. The NSR will be prepared in accordance with the latest Caltrans Technical Noise Supplement and TNAP.

**8.14 Energy and Climate Change:** The proposed project would relieve congestion and improve travel efficiency through the I-605/Katella Avenue interchange area. Energy consumption would potentially be reduced upon project completion due to improved traffic circulation. Construction energy consumption would be temporary in nature and all construction equipment would be required to operate per the equipment manuals. In addition, existing SCAQMD air quality requirements pertaining to construction equipment would also help to reduce energy consumption from construction equipment. A separate energy technical study will not be required.

It is generally agreed that individual transportation projects, by themselves, do not yield sufficient greenhouse gas (GHG) emissions to have a significant impact on global climate change, but an individual project may make an incremental contribution to cumulative climate change impacts, along with all other global sources of GHG. An Air Quality Assessment Report will be required for the proposed project and will include a quantitative analysis of GHGs. This quantitative analysis will use the California Air Resources Board's (CARB's) EMFAC model to compare relative carbon dioxide (CO<sub>2</sub>) emissions for all alternatives.

**8.15 Biological Environment:** The project site has been highly disturbed through the development of roadway infrastructure and urban development immediately adjacent to site boundaries. Vegetation within the project site vicinity is composed of ornamental landscaping within and surrounding interchange loop ramps, and also along Katella Avenue within the center median and along adjacent properties.

Coyote Creek Channel, a concrete-lined drainage facility, is located immediately west of the proposed project site. This facility is owned by the ACOE and is maintained by the Los Angeles County Department of Public Works. The project does not propose improvements that would affect Coyote Creek Channel or ACOE jurisdiction; however, in the event impacts to this drainage channel become necessary, a Federal permit through the ACOE and associated NEPA clearance would be required.

The project would result in impacts to vegetation within and surrounding the existing interchange, including numerous mature Jacaranda trees along the southern side of Katella Avenue (under Alternatives 2 and 4). Due to these impacts to ornamental vegetation and construction in close proximity to Coyote Creek Channel, a Natural Environment Study – Minimal Impact (NES-MI) will be prepared during PA/ED to analyze the potential for impacts to biological resources.

**8.16 Cumulative Impacts:** All cumulative impacts will be addressed during PA/ED. All cumulative impacts will also be addressed within the individual resource technical studies identified in Sections 8.1 through 8.15, above.

**8.17 Context Sensitive Solutions:** Context Sensitive Solutions (CSS) is defined as “innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance and performance goals”. As part of this proposed project, there are anticipated to be a series of public workshops and/or potential interviews with stakeholders and property owners. In addition, a public workshop is anticipated to be held during the public circulation of the environmental document.

Caltrans also uses CSS as an approach to plan, design, construct, maintain, and operate its transportation system. CSS employs a collaborative, interdisciplinary approach involving all stakeholders to promote concepts that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. As the project progresses through the next phase (PA/ED), the incorporation of CSS will be implemented through coordination amongst the Project Development Team.

## **9. Summary Statement for PSR or PSR-PDS**

Based on the technical summaries described above, it is expected that impacts associated with all build alternatives would be mitigated to a level below significance. Completion of PA/ED is expected to take approximately 24 months.

Several technical studies are required for this proposed project. It is not anticipated that the individual resource evaluations will identify significant environmental concerns within or adjacent to the proposed project area that cannot be mitigated. If additional technical studies are necessary, the completion of these studies could affect schedule and cost. Construction monitoring for biological and cultural resources, if deemed necessary, could also complicate, slow, or lengthen the schedule and increase costs.

## **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 Sherri Gust, RPA	Date: 8/12/14
Biologist Travis McGill	Date: 6/18/14
Community Impacts specialist Leili Namazi	Date: 6/24/14
Noise and Vibration specialist Achilles Malisos	Date: 10/3/14
Air Quality specialist Achilles Malisos	Date: 1/7/15
Paleontology specialist/liaison Sherri Gust, RPA	Date: 8/12/14
Water Quality specialist Brad Losey	Date: 1/6/15
Hydrology and Floodplain specialist Brad Losey	Date: 6/20/14
Hazardous Waste/Materials specialist Kristen Bogue	Date: 8/11/14
Visual/Aesthetics specialist Kristen Bogue	Date: 8/10/14
Energy and Climate Change specialist Achilles Malisos	Date: 6/25/14
PEAR Preparer (Name and Title) Alan Ashimine, Environmental Project Manager	Date: 2/11/15

## 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.

  
\_\_\_\_\_  
Environmental Branch Chief

Date: 4/9/2015

  
\_\_\_\_\_  
Project Manager

Date: 4/1/2015

### REQUIRED ATTACHMENTS:

- Attachment A: PEAR Environmental Studies Checklist
- Attachment B: Estimated Resources by WBS Code
- Attachment C: Schedule (Gantt Chart)

ATTACHMENT A

PEAR Environmental Studies Checklist

## Attachment A: PEAR Environmental Studies Checklist

Rev. 11/08

<b>Environmental Studies for PA&amp;ED Checklist</b>					
	Not anticipated	Memo to file	Report required	Risk* L M H	Comments
Land Use	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Growth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Farmlands/Timberlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Community Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Community Character and Cohesion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Relocations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Environmental Justice	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Utilities/Emergency Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Visual/Aesthetics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Cultural Resources:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	M	
Archaeological Survey Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Historic Resources Evaluation Report	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Historic Property Survey Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	M	
Historic Resource Compliance Report	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Section 106 / PRC 5024 & 5024.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Native American Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	HPSR/ASR
Finding of Effect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Data Recovery Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Memorandum of Agreement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Hydrology and Floodplain	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Water Quality and Stormwater Runoff	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Geology, Soils, Seismic and Topography	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Paleontology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
PER	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	PIR/PER
PMP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Hazardous Waste/Materials:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
ISA (Additional)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
PSI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Air Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Noise and Vibration	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Energy and Climate Change	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	In ED
Biological Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Natural Environment Study	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	NES-MI
Section 7:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Formal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Informal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
No effect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Section 10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
USFWS Consultation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
NMFS Consultation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Species of Concern (CNPS, USFS, BLM, S, F)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	

## Environmental Studies for PA&ED Checklist

	Not anticipated	Memo to file	Report required	Risk*			Comments
				L	M	H	
Wetlands & Other Waters/Delineation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
404(b)(1) Alternatives Analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
Invasive Species	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			In ED
Wild & Scenic River Consistency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
Coastal Management Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
HMMP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
DFG Consistency Determination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
2081	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
Other:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
Cumulative Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			In ED
Context Sensitive Solutions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
Section 4(f) Evaluation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
<b>Permits:</b>							
401 Certification Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
404 Permit Coordination, IP, NWP, or LOP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
1602 Agreement Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
Local Coastal Development Permit Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
State Coastal Development Permit Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
NPDES Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>L</u>			
US Coast Guard (Section 10)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
TRPA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			
BCDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>L</u>			

ATTACHMENT B

Resources by WBS Code

**ATTACHMENT B - Resources by WBS Code**

**EA:** **OK870K** *NOTE: This WBS resource estimating tool is for Generalist use ONLY when a district-specific WBS estimating tool is not available. Check with your supervisor before using this form.* WBS current 11/2008

**Description: I-605/Katella**

Assigned Unit	Senior	Coord	Biology	Cultural	Haz Waste	Socio-Economic	Storm Water	Noise/Air	Paleo	Sup Svcs	Total	Begin Date	End Date	Duration (days)
<b>Project Management</b>														
100.05.05 – Project Init. & Png.	8	12									20			0
100.05.10 – PID Cmpnt Exec. & Ctrl.	5	8									13			0
100.05.15 – PID Cmpnt Closeout	5	8									13			0
100.10.05 – PA&ED Cmpnt Init. & Png.	5	8									13			0
100.10.10 – PA&ED Cmpnt Exec. & Ctrl.	5	8									13			0
100.10.15 – PA&ED Cmpnt Closeout	5	8									13			0
100.10.20 – Project Shelving (PA&ED)	5	8									13			0
100.10.25 – Project Unshelving (PA&ED)	5	8									13			0
100.10.30 – Updd Admtv Rec during PA&ED	5	8									13			0
100.10.35 – Execd Coop Agre for PA&ED Process	5	8									13			0
100.15.05 – PS&E Cmpnt Init. & Png.	5	8									13			0
100.15.10 – PS&E Cmpnt Exec. & Ctrl.	5	8									13			0
100.15.15 – PS&E Cmpnt Closeout	5	8									13			0
100.15.20 – Project Shelving (PS&E)	5	8									13			0
100.15.25 – Project Unshelving (PS&E)	5	8									13			0
100.15.30 – Updd Admtv Rec during PS&E	5	8									13			0
100.15.35 – Execd Coop Agre for PS&E Process		5									5			0
100.20.05 – Const. Cmpnt Init. & Png.		8									8			0
100.20.10 – Const. Cmpnt Exec. & Ctrl.		8									8			0
100.20.15 – Const. Cmpnt Closeout		8									8			0
100.20.20 – Project Shelving (Construction)		8									8			0
100.20.25 – Project Unshelving (Construction)		8									8			0
100.20.30 – Updd Admtv Rec during Const		5									5			0
100.20.35 – Execd Coop Agre for Const Process		5									5			0
100.25.05 – R/W Cmpnt Init. & Png.		8									8			0
100.25.10 – R/W Cmpnt Exec. & Ctrl.		8									8			0
100.25.15 – R/W Cmpnt Closeout		8									8			0
100.25.20 – Project Shelving (Right of Way)		5									5			0
100.25.25 – Project Unshelving (Right of Way)		5									5			0
100.25.30 – Updd Admtv Rec during R/W		5									5			0
100.25.35 – Execd Coop Agre for R/W Process		8									8			0
100.25.50 – Execd Coop Agre for R/W Rlnmnt		8									8			0
<b>Total Project Management</b>	<b>83</b>	<b>242</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>325</b>			

**Perform Preliminary Engineering Studies and Prepare Draft Project Report**

160.05.05 – Approvd PID Review	5	8									13			0
160.05.10 – Geotechnical Information Review	5	8									13			0
160.05.20 – Traffic Data & Forecasts Review											0			0
160.05.30 – Project Scope Review	4	8	4	3	2			4	2		27			0
160.10.20 – Value Analysis											0			0
160.10.25 – Hydraulics/Hydro Study											0			0
160.10.30 – Hwy Planting Des Concepts	5	8									13			0
160.15.20 – Draft Project Report	8	12									20			0
160.15.25 – Draft PR Circ, Rev & App	8	12									20			0
160.30.05 – Maps for ESR	5	8									13			0
160.30.10 – Surveys/Maps for Env Studies	5	8									13			0
160.30.15 – Prop Access Rights for Env/Eng Studies		5									5			0
160.40 – NEPA Delegation											0			0
<b>Total Prelim Eng Studies</b>	<b>45</b>	<b>77</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>137</b>			

Assigned Unit	Senior	Coord	Biology	Cultural	Haz Waste	Socio-Economic	Storm Water	Noise/Air	Paleo	Sup Svcs	Total	Begin Date	End Date	Duration (days)
<b>Perform Environmental Studies and Prepare Draft Environmental Document</b>														
165.05.05 – Project Information Review	10	12									22			0
165.05.10 – Pub & Agency Scoping		10									10			0
165.05.15 – Alts for Further Study	10	12									22			0
165.10.15 – CIA, Land Use & Growth											0			0
165.10.25 – Noise Study	15	18						40			73			0
165.10.30 – Air Quality Study	10	12						40			62			0
165.10.35 – Water Quality Studies	10	12					40				62			0
165.10.40 – Energy/Climate Change Studies	5	8									13			0
165.10.45 – Sum Geotech Report	10	12									22			0
165.10.50 – Preliminary Site Investigation HW	10	12			30						52			0
165.10.55 – Draft R/W Relocation Impact Eval											0			0
165.10.65 – Paleontology Study	10	12							30		52			0
165.10.70 – Wild & Scenic River Coordination											0			0
165.10.75 – Envir Commitments Record	20	24									44			0
165.10.99 - Other Env Studies	10	12									22			0
165.15.05 – Biological Assessment											0			0
165.15.10 – Wetlands Study											0			0
165.15.15 – Resource Agency Coord											0			0
165.15.20 – NES Report	8	10	30								48			0
165.15.99 – Other Biological Studies											0			0
165.20.05 – Archaeology Survey	5	8		32							45			0
165.20.05.05 – APE Map				24							24			0
165.20.05.10 – NA Consultation				30							30			0
165.20.05.15 – Records & Literature Search				20							20			0
165.20.05.20 – Field Survey				16							16			0
165.20.05.25 – ASR				60							60			0
165.20.05.99 – Other Archy Survey Products											0			0
165.20.10 – Extended Phase I Archy Studies											0			0
165.20.10.05 – Native American Consultation											0			0
165.20.10.10 – Extended Phase I Proposal											0			0
165.20.10.15 – XP1 Field Investigation											0			0
165.20.10.20 – XP1 Materials Analysis											0			0
165.20.10.25 – Extended Phase I Report											0			0
165.20.10.99 – Other Phase I Archy Products											0			0
165.20.15 – Phase II Archy Studies											0			0
165.20.15.05 – NA Consultation											0			0
165.20.15.10 – Phase II Proposal											0			0
165.20.15.15 – Field Investigation											0			0
165.20.15.20 – Materials Analysis											0			0
165.20.15.25 – Phase II Report											0			0
165.20.15.99 – Other Phase II Archy Products											0			0
165.20.20 – Hist & Architectural Studies											0			0
165.20.20.05 – Prelim APE/Study Area Maps - Archl											0			0
165.20.20.10 – Hist Res Eval Rpt - Archy											0			0
165.20.20.15 – Hist Res Eval Rpt - Archl											0			0
165.20.20.20 – Bridge Evaluation											0			0
165.20.20.99 – Other H & A Study Products											0			0
165.20.25 – Cultural Res Comp Docs	5	8									13			0
165.20.25.05 – Final APE Maps	2	4		24							30			0
165.20.25.10 – PRC 5024.5 Consult											0			0
165.20.25.15 – HPSR/HRCR	5	8		70							83			0
165.20.25.20 – Finding of Effect											0			0
165.20.25.25 – Archy Data Recovery Pln											0			0
165.20.25.30 – MOA											0			0
165.20.25.99 – Other Cult Res Comp Products											0			0
165.25.05 – Draft ED Analysis	20	30									50			0
165.25.10 – 4(f) Evaluation											0			0
165.25.15 – CE/CE Determination											0			0



165.25.20 – Env Quality Control & Other Reviews	15	18										33			0
165.25.25 – Approval to Circ Resolution	15	18										33			0
<b>Assigned Unit</b>	<b>Senior</b>	<b>Coord</b>	<b>Biology</b>	<b>Cultural</b>	<b>Haz Waste</b>	<b>Socio-Economic</b>	<b>Storm Water</b>	<b>Noise/Air</b>	<b>Paleo</b>	<b>Sup Svcs</b>	<b>Total</b>	<b>Begin Date</b>	<b>End Date</b>	<b>Duration (days)</b>	
165.25.30 – Env Coordination	20	24									44			0	
165.25.99 – Other DED Products	5	8								40	53			0	
165.30 – NEPA Delegation	20	24									44			0	
Total Env Studies & Prep DED	240	316	30	276	30	0	40	80	30	40	1082				
<b>Permits, Agreements, and Route Adoptions during PA&amp;ED Cmpnt</b>															
170.05 - Required Permits (list)											0				0
170.10.05 - US Army Corps 404 Permit											0				0
170.10.10 - US Forest Service Permit(s)											0				0
170.10.15 - US Coast Guard Permit											0				0
170.10.20 - DFG 1600 Agreement(s)											0				0
170.10.25 - Coastal Zone Development Permit											0				0
170.10.30 - Local Agency Concurrence/Permit											0				0
170.10.40 - Waste Discharge (NPDES) Permit(s)											0				0
170.10.45 - US Fish & Wildlife Service Approval											0				0
170.10.50 - RWQCB 401 Permit											0				0
170.10.60 - Updated ECR											0				0
170.10.95 - Other Permits											0				0
170.45 - MOU from TERO Office											0				0
170.55 - NEPA Delegation											0				0
Total Permits, Agreements & Route Adoptions	0	0	0	0	0	0	0	0	0	0	0				0
<b>Circulate Draft Environmental Document and Select Preferred Project Alternative</b>															
175.05.05 – Master Dist & Invitation Lists		10									10				0
175.05.10 – Notices Pub Hear & DED Avail		10									10				0
175.05.15 – DED Pub & Circulation	20	24									44				0
175.05.20 – Fed Consistency Det (Coastal)											0				0
175.05.99 – Other DED Circulation Products	15	18									33				0
175.10.05 – Need for Pub Hearing Determination		10									10				0
175.10.10 – Pub Hearing Logistics		10									10				0
175.10.15 – Displays for Pub Hearing											0				0
175.10.20 – 2nd Notice Pub Hear & Avail	10	12									22				0
175.10.25 – Map Display & Hearing Plan											0				0
175.10.30 – Display Pub Hear Maps											0				0
175.10.35 – Public Hearing	15	18									33				0
175.10.40 – Record of Public Hearing											0				0
175.10.99 – Other Pub Hearing Products											0				0
175.15 – Responses to Pub Hear Comments	35	40									75				0
175.20 – Project Preferred Alternative											0				0
175.25 – NEPA Delegation											0				0
Total DED & Preferred Alt	95	152	0	0	0	0	0	0	0	0	247				
<b>Prepare and Approve Project Report and Final Environmental Document</b>															
180.05.10 – Approved Project Rep	8	10									18				0
180.05.15 – Updated Stormwater Data Report	8	10									18				0
180.10.05 – Approved FED	10	12									22				0
180.10.05.05 – Draft FED Review	10	12									22				0
180.10.05.10 – Revised Draft FED	15	18									33				0
180.10.05.15 – Section 4(f) Evaluation											0				0
180.10.05.20 – Findings Report											0				0
180.10.05.25 – Statement of Overriding Consid											0				0
180.10.05.30 – CEQA Certification	8	10									18				0
180.10.05.35 – FHWA and Approval											0				0
180.10.05.40 – Section 106 Cons & MOA											0				0
180.10.05.45 – Section 7 Consultation											0				0
180.10.05.50 – Final Section 4(f) Statement											0				0
180.10.05.55 – Floodplain Only PAF											0				0

180.10.05.60 –Wetlands Only PAF												0			0
180.10.05.65 – Sect 404 Permit Compliance												0			0
180.10.05.70 – Mitigation Measures	15	18										33			0
180.10.10 – Public Dist & Resp to Comments												0			0
<b>Assigned Unit</b>	<b>Senior</b>	<b>Coord</b>	<b>Biology</b>	<b>Cultural</b>	<b>Haz Waste</b>	<b>Socio-Economic</b>	<b>Storm Water</b>	<b>Noise/Air</b>	<b>Paleo</b>	<b>Sup Svcs</b>	<b>Total</b>	<b>Begin Date</b>	<b>End Date</b>	<b>Duration (days)</b>	
180.10.15 – Final R/W Relo Impact Document											0				0
180.10.99 – Other FED Products											0				0
180.15.05 – ROD (NEPA)		10									10				0
180.15.10 – NOD (CEQA)											0				0
180.15.20 – Env Commitments Record	15	10									25				0
180.15.99 – Other Complete ED Products	10	12									22				0
180.20 – NEPA Delegation											0				0
Total App PR & FED	99	122	0	0	0	0	0	0	0	0	221				
<b>Update Project Info for PS&amp;E</b>															
185.05.05 – Project Concept Review for PS&E	5	10									15				0
185.05.10 – Updated Project Info for PS&E dev	5	10									15				0
Total Update for PS&E	10	20	0	0	0	0	0	0	0	0	30				
<b>ROW &amp; Excess Land</b>															
195.40.25 – Property Maint & Rehab (non-rental)											0				0
195.40.35 – Transfer of Prop to Clear Status											0				0
195.45.05 – Excess Lands Inventory											0				0
195.45.20 – Prop Disp Units less than \$15 K											0				0
195.45.25 – Prop Disp Units \$15 K -\$500 K											0				0
195.45.30 – Prop Disp Units over \$500 K											0				0
Total ROW & Excess Land	0	0	0	0	0	0	0	0	0	0	0				
<b>Utility Relocation</b>															
200.15 – Approved Utility Relocation Plan											0				0
200.20 – Utility Relocation Package											0				0
Total Coordinate Utilities	0	0	0	0	0	0	0	0	0	0	0				
<b>Permits, Agreements, and Route Adoptions during PS&amp;E Cmpnt</b>															
205.10.05 - US Army Corps 404 Permit											0				0
205.10.10 - US Forest Service Permit(s)											0				0
205.10.15 - US Coast Guard Permit											0				0
205.10.20 - DFG 1600 Agreement											0				0
205.10.25 - Coastal Development Permit											0				0
205.10.30 - Local Agency Concurrence/Permit											0				0
205.10.40 - Waste Discharge (NPDES) permit											0				0
205.10.45 - US Fish & Wildlife Service Approval											0				0
205.10.50 - RWQCB 401 Permit											0				0
205.10.60 - Updated ECR											0				0
205.10.95 - Other Permits											0				0
205.20.05 – Draft Fwy Agreement											0				0
205.20.10 – Draft Fwy Agree Review											0				0
205.20.15 – Final Fwy Agree											0				0
205.20.20 – Executed Fwy Agreement											0				0
205.40.10 - New Connections & Route Adopt SbtI											0				0
205.55 - NEPA Delegation											0				0
Total Permits, Agreements, and Route Adoptions	0	0	0	0	0	0	0	0	0	0	0				

Assigned Unit	Senior	Coord	Biology	Cultural	Haz Waste	Socio-Economic	Storm Water	Noise/Air	Paleo	Sup Svcs	Total	Begin Date	End Date	Duration (days)
<b>Right of Way Interests</b>														
225.55.20 – Right of Way Clearance											0			0
Total Right of Way Interests	0	0	0	0	0	0	0	0	0	0	0			
<b>Prepare Draft PS&amp;E</b>														
230.05.45 – Noise Barrier Plans											0			0
230.10.05 – Hwy Planting Plans											0			0
230.10.15 – Plant List											0			0
230.35.10 – Hwy Planting Specs											0			0
230.35.35 – Water Pollution Ctrl Specs											0			0
230.35.40 – Erosion Control Specs											0			0
230.60 – Updated Proj Info for PS&E Package											0			0
230.60.05 - Updated Storm Water Data Report											0			0
230.60.10 – Other Reviews/Updates Proj Info											0			0
230.90 – NEPA Delegation											0			0
Total Prepare Draft PS&E	0	0	0	0	0	0	0	0	0	0	0			
<b>Mitigate Environmental Impacts and Clean-up Hazardous Waste</b>														
235.05.05 – Hist Structures Mitig											0			0
235.05.10 – Archy & Cult Mitigation											0			0
235.05.15 – Biological Mitigation											0			0
235.05.20 – Env Mitigation R/W work											0			0
235.05.25 – Paleontology Mitigation											0			0
235.05.99 - Other Env Mitigation Products											0			0
235.10.10 – Haz Waste Sites Survey											0			0
235.10.15 – Detailed HW Sites Investigation											0			0
235.15 – HW Management Plan											0			0
235.20 – HW PS&E											0			0
235.25 – HW Clean-up											0			0
235.30 – Certification of Sufficiency (HW)											0			0
235.35 – Long Term Mitigation Monitoring											0			0
235.40 – Updated ECR											0			0
235.45 – NEPA Delegation											0			0
Total Mitigation & HW Clean-up	0	0	0	0	0	0	0	0	0	0	0			
<b>Permits for Subsurface Geotechnical Exploration</b>														
240.70 – Site Ready for Subsurface Exploration											0			0
Total Geotechnical Permit	0	0	0	0	0	0	0	0	0	0	0			
<b>Circulate, Review and Prepare Final District PS&amp;E Package</b>														
255.05 – Circ & Rev Draft Dist PS&E											0			0
255.10.25 - Updated Technical Reports											0			0
255.15 – Env Reevaluation											0			0
255.20.05 - Rev Plans for Stds Comp											0			0
255.40 - Res Engs Pending File											0			0
255.45 – NEPA Delegation											0			0
Total PS&E	0	0	0	0	0	0	0	0	0	0	0			

Assigned Unit	Senior	Coord	Biology	Cultural	Haz Waste	Socio-Economic	Storm Water	Noise/Air	Paleo	Sup Svcs	Total	Begin Date	End Date	Duration (days)
<b>Prepare Contract Documents</b>														
260.75 - Env Cert at RTL											0			0
Total Prepare Contract Documents	0	0	0	0	0	0	0	0	0	0	0			
<b>Perform Construction Engineering and General Contract Administration</b>														
270.20.50 – Technical Support											0			0
270.55 – Final Inspect & Accept Rec											0			0
270.70 – Update ECR											0			0
270.75 – Permit Renewal & Extension											0			0
270.80 – Long-Term Mitigation Contract											0			0
Total Const Engineering	0	0	0	0	0	0	0	0	0	0	0			
<b>Prepare and Administer Contract Change Orders</b>														
285.05.05 - Need for CCO Determination											0			0
285.10.15 – Other Func Support											0			0
Total CCOs	0	0	0	0	0	0	0	0	0	0	0			
<b>Resolve Contract Claims</b>														
290.35 – Provide Technical Support											0			0
Total Contract Claims	0	0	0	0	0	0	0	0	0	0	0			
<b>Accept Contract, Prepare Final Construction Estimate &amp; Prepare Final Report</b>														
295.35 – Cert of Env Compliance											0			0
295.40 – Long-Term Mitigation Contract											0			0
Total Final Construction	0	0	0	0	0	0	0	0	0	0	0			
<b>Total Project Hours</b>	<b>572</b>	<b>929</b>	<b>34</b>	<b>279</b>	<b>32</b>	<b>0</b>	<b>40</b>	<b>84</b>	<b>32</b>	<b>40</b>	<b>2042</b>			

ATTACHMENT C

Schedule (Gantt Chart)

# I-605/Katella Avenue Interchange Improvements

ID	Task Name	Duration	Start	Finish	1st Half		2nd Half		1st Half		2nd Half		1st Half		2nd Half					
					Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4				
1	Program Project	1 day	Wed 4/1/15	Wed 4/1/15	◆ 4/1															
2	Environmental Technical Studies	160 days	Fri 7/1/16	Thu 2/9/17																
3	Prepare Technical Studies	50 days	Fri 7/1/16	Thu 9/8/16																
4	HPSR/ASR	10 wks	Fri 7/1/16	Thu 9/8/16																
5	PIR/PER	10 wks	Fri 7/1/16	Thu 9/8/16																
6	Water Quality	10 wks	Fri 7/1/16	Thu 9/8/16																
7	NES-MI	10 wks	Fri 7/1/16	Thu 9/8/16																
8	Air Quality	10 wks	Fri 7/1/16	Thu 9/8/16																
9	Noise	10 wks	Fri 7/1/16	Thu 9/8/16																
10	Phase I	10 wks	Fri 7/1/16	Thu 9/8/16																
11	Caltrans Review	6 wks	Fri 9/9/16	Thu 10/20/16																
12	Disposition of Caltrans Comments	6 wks	Fri 10/21/16	Thu 12/1/16																
13	Caltrans Review	6 wks	Fri 12/2/16	Thu 1/12/17																
14	Finalization of Technical Studies	4 wks	Fri 1/13/17	Thu 2/9/17																
15	Preparation of DPR and DED	195 days	Fri 2/10/17	Thu 11/9/17																
16	Prepare DPR and DED	16 wks	Fri 2/10/17	Thu 6/1/17																
17	Caltrans Review	6 wks	Fri 6/2/17	Thu 7/13/17																
18	Disposition of Caltrans Comments	6 wks	Fri 7/14/17	Thu 8/24/17																
19	Caltrans Review	6 wks	Fri 8/25/17	Thu 10/5/17																
20	Finalization of DPR and DED	5 wks	Fri 10/6/17	Thu 11/9/17																
21	Circulate DPR and DED Externally	4.3 wks	Fri 11/10/17	Mon 12/11/17																
22	Finalization of DPR and DED	140 days	Mon 12/11/17	Mon 6/25/18																
23	Prepare Final DPR and DED	8 wks	Mon 12/11/17	Mon 2/5/18																
24	Caltrans Review	6 wks	Mon 2/5/18	Mon 3/19/18																
25	Disposition of Caltrans Comments	6 wks	Mon 3/19/18	Mon 4/30/18																
26	Finalize DPR and DED	6 wks	Mon 4/30/18	Mon 6/11/18																
27	Caltrans Approval	2 wks	Mon 6/11/18	Mon 6/25/18																
28	Completion of PA/ED	1 day	Mon 6/25/18	Tue 6/26/18	6/25 ◆															

Updated: August 14, 2014	Task		External MileTask	◆	Manual Summary Rollup	
	Split		Inactive Task		Manual Summary	
	Milestone	◆	Inactive Milestone	◆	Start-only	
	Summary		Inactive Summary		Finish-only	
	Project Summary		Manual Task		Progress	
	External Tasks		Duration-only		Split	↓

## **Capital Outlay Project Estimates**

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Attachment I

**PRELIMINARY  
PROJECT COST ESTIMATE SUMMARY**

Type of Estimate	<u>PSR-PDS</u>	Dist - CO - RTE
		<u>12-Ora-605</u>
		PM <u>1.1/1.6</u>
		EA <u>0K870K</u>
		Program Code <u>20.10.400.000</u>

Project Description: I-605 / Katella Ave Interchange Improvements

Limits: In Orange County at I-605 / Katella Ave

Proposed Improvements (Scope): Reconfigure NB Ramp Termini, Add 2nd Lane to NB Off Ramp at Mainline, Modify SB Loop Off Ramp Lane Addition at Katella Ave, Modify Lane Configurations on Eastbound and Westbound Katella Avenue between Coyote Creek Channel and Civic Center Drive

Alternative: 2 -Northbound Ramps Modifications

<b>ROADWAY ITEMS</b>	<u>\$6,800,000</u>
<b>STRUCTURE ITEMS</b>	<u>\$0</u>
<b>SUBTOTAL CONSTRUCTION</b>	<u>\$6,800,000</u>
<b>RIGHT OF WAY</b>	<u>\$400,000</u>
<b>TOTAL PROJECT COST</b>	<u>\$7,200,000</u>



**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM           1.1/1.6  
EA           0K870K  
Program Code 20.10.400.000

**I. ROADWAY ITEMS**

	Quantity	Unit	Unit Price	Unit Cost
<b><u>Section 1 Earthwork</u></b>				
Grading	12,000	CY	\$30.00	\$360,000
Fine Grading	108,600	SF	\$1.00	\$108,600
Clearing & Grubbing	3	AC	\$2,000.00	\$6,000
Develop Water Supply	1	LS	\$10,000.00	\$10,000
			<b>Total Earthwork</b>	<u>\$484,600</u>

<b><u>Section 2 Structural Section</u></b>				
Construct Ramp Pavement	44,000	SF	\$5.00	\$220,000
Construct Arterial Pavement	45,000	SF	\$5.00	\$225,000
Construct Curb & Gutter	3,800	LF	\$15.00	\$57,000
Construct Median Curb	200	LF	\$15.00	\$3,000
Construct PCC Sidewalk	19,600	SF	\$3.00	\$58,800
Construct Access Ramps	10	EA	\$5,000.00	\$50,000
Remove Pavement	86,000	SF	\$2.00	\$172,000
			<b>Total Structural Section</b>	<u>\$785,800</u>

<b><u>Section 3 Drainage</u></b>				
Large Drainage Facilites	1	LS	\$75,000.00	\$75,000
OCPW Upgrades (Katella RCB)	1	LS	\$1,120,000.00	\$1,120,000
Pumping Plants	~	~	~	\$0
Project Drainage (X-Drains, overside, etc.)	1	LS	\$350,000	\$350,000
			<b>Total Drainage</b>	<u>\$1,545,000</u>

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM            1.1/1.6  
EA            0K870K  
Program Code 20.10.400.000

	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Unit Cost</b>
<b><u>Section 4: Specialty Items</u></b>				
Retaining Walls - Type 1	0	SF	\$150	\$0
Retaining Walls - Tie-Back	0	SF	\$170	\$0
Treatment BMPs	1	LS	\$620,000	\$620,000
Job Site Management	1	LS	\$43,000	\$43,000
			<b>Total Specialty Items</b>	<u>\$663,000</u>

<b><u>Section 5 Traffic Items</u></b>				
Lighting	17	EA	\$5,000	\$85,000
Traffic Signals	1	EA	\$300,000	\$300,000
Permanent Signing/Striping	1	LS	\$45,000	\$45,000
Bridge Mounted Overhead Signs	0	EA	\$40,000	\$0
Overhead Sign Structures	1	EA	\$60,000	\$60,000
Traffic Control	1	LS	\$300,000	\$300,000
Ramp Metering System	1	EA	\$100,000	\$100,000
			<b>Total Traffic Items</b>	<u>\$890,000</u>

**SUBTOTAL SECTIONS 1-5**    \$4,368,000

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM 1.1/1.6  
EA 0K870K  
Program Code 20.10.400.000

**Section 6 Minor Items**

	<b>Unit Cost</b>	
Subtotal Sections 1-5 <u>\$4,368,000</u> x (10%)	<u>\$436,800</u>	
<b>TOTAL MINOR ITEMS</b>		<u>\$436,800</u>

**Section 7 Roadway Mobilization**

Subtotal Sections 1-5 <u>\$4,368,000</u>		
Minor Items <u>\$436,800</u>		
SUM <u>\$4,804,800</u> x (10%)	<u>\$480,000</u>	
<b>TOTAL ROADWAY MOBILIZATION</b>		<u>\$480,000</u>

**Section 8 Roadway Additions**

Supplemental

Subtotal Sections 1-5 <u>\$4,368,000</u>		
Minor Items <u>\$436,800</u>		
SUM <u>\$4,804,800</u> x (5%)	<u>\$240,000</u>	

Contingencies

Subtotal Sections 1-5 <u>\$4,368,000</u>		
Minor Items <u>\$436,800</u>		
SUM <u>\$4,804,800</u> x (25%)	<u>1,201,000</u>	

**TOTAL ROADWAY ADDITIONS** 1,441,000

**TOTAL ROADWAY ITEMS** 6,726,000

(Total Sections 1-8)

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM                   1.1/1.6  
EA                   0K870K  
Program Code 20.10.400.000

**II. STRUCTURE ITEMS**

Bridge Name	<u>n/a</u>	<u>n/a</u>
	_____	_____
	_____	_____
Structure Type	_____	_____
Width (ft) (out to out)	_____	_____
Span (ft)	_____	_____
Area (sq ft)	_____	_____
Footing Type (pile/spread)	_____	_____
Cost Per Sq. Ft. (incl. 10% mobilization and 25% contingency)	_____	_____
Subtotal Structure	_____ \$0	_____ \$0
Demolition (incl. 10% mobilization and 25% contingency)	_____ \$0	_____ 0
Total Cost for Structure	_____ \$0	_____ \$0
		<b>SUBTOTAL STRUCTURES ITEMS</b> _____ \$0
Railroad Related Costs		_____ \$0
		<b>TOTAL STRUCTURES ITEMS</b> _____ \$0

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM 1.1/1.6  
EA 0K870K  
Program Code 20.10.400.000

III. RIGHT OF WAY

	Current Values		Escalation Rates %		Escalated Values*
Acquisition, including excess lands and damages to remainder (s)	\$178,620		0		\$179,000
Utility Relocations	~	~	~	~	\$100,000
Clearance / Demolition	~	~	~	~	~
RAP	~	~	~	~	~
Title and Escrow Fees	\$23,400	~	0	~	\$23,000
				TOTAL RIGHT OF WAY	<u>\$302,000</u>

CONSTRUCTION CONTRACT WORK \$0

\*Escalated to assumed year of advertising of Not escalated

Estimate Prepared By RBF Consulting Phone # (949) 472-3505

Date 2/2015

**PRELIMINARY  
PROJECT COST ESTIMATE SUMMARY**

Type of Estimate	<u>PSR-PDS</u>	Dist - CO - RTE
		<u>12-Ora-605</u>
		PM <u>1.1/1.6</u>
		EA <u>0K870K</u>
		Program Code <u>20.10.400.000</u>

Project Description: I-605 / Katella Ave Interchange Improvements

Limits: In Orange County at I-605 / Katella Ave

Proposed Improvements (Scope): Reconfigure NB Ramp Termini, Add 2nd Lane to NB Off Ramp at Mainline, Remove SB Loop On Ramp, Provide Dual WB Left from Katella Ave to SB On Ramp, Reconfigure SB Ramp Termini, Modify Lane Configurations on Eastbound and Westbound Katella Avenue between Coyote Creek Channel and Civic Center Drive

Alternative: 3 -Remove SB Loop On Ramp

<b>ROADWAY ITEMS</b>	<u>\$9,700,000</u>
<b>STRUCTURE ITEMS</b>	<u>\$0</u>
<b>SUBTOTAL CONSTRUCTION</b>	<u>\$9,700,000</u>
<b>RIGHT OF WAY</b>	<u>\$400,000</u>
<b>TOTAL PROJECT COST</b>	<u>\$10,100,000</u>

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM           1.1/1.6  
EA           0K870K  
Program Code 20.10.400.000

**I. ROADWAY ITEMS**

	Quantity	Unit	Unit Price	Unit Cost
<b><u>Section 1 Earthwork</u></b>				
Grading	20,000	CY	\$30.00	\$600,000
Fine Grading	138,800	SF	\$1.00	\$138,800
Clearing & Grubbing	4	AC	\$2,000.00	\$8,000
Develop Water Supply	1	LS	\$10,000.00	\$10,000
			<b>Total Earthwork</b>	<u>\$756,800</u>

<b><u>Section 2 Structural Section</u></b>				
Construct Ramp Pavement	66,000	SF	\$5.00	\$330,000
Construct Arterial Pavement	60,000	SF	\$5.00	\$300,000
Construct Curb & Gutter	4,100	LF	\$15.00	\$61,500
Construct Median Curb	200	LF	\$15.00	\$3,000
Construct PCC Sidewalk	12,800	SF	\$3.00	\$38,400
Construct Access Ramps	9	EA	\$5,000.00	\$45,000
Remove Pavement	130,500	SF	\$2.00	\$261,000
			<b>Total Structural Section</b>	<u>\$1,038,900</u>

<b><u>Section 3 Drainage</u></b>				
Large Drainage Facilites	1	LS	\$225,000.00	\$225,000
OCPW Upgrades (Katella RCB)	1	LS	\$1,120,000.00	\$1,120,000
Pumping Plants	~	~	~	\$0
Project Drainage (X-Drains, overside, etc.)	1	LS	\$350,000	\$350,000
			<b>Total Drainage</b>	<u>\$1,695,000</u>

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM            1.1/1.6  
EA            0K870K  
Program Code 20.10.400.000

	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Unit Cost</b>
<b><u>Section 4: Specialty Items</u></b>				
Retaining Walls - Type 1	4160	SF	\$150	\$624,000
Retaining Walls - Tie-Back	0	SF	\$170	\$0
Treatment BMPs	1	LS	\$620,000	\$620,000
Job Site Management	1	LS	\$63,000	\$63,000
			<b>Total Specialty Items</b>	<u>\$1,307,000</u>

<b><u>Section 5 Traffic Items</u></b>				
Lighting	21	EA	\$5,000	\$105,000
Traffic Signals	2	EA	\$300,000	\$600,000
Permanent Signing/Striping	1	LS	\$53,000	\$53,000
Bridge Mounted Overhead Signs	1	EA	\$40,000	\$40,000
Overhead Sign Structures	1	EA	\$60,000	\$60,000
Traffic Control	1	LS	\$400,000	\$400,000
Ramp Metering System	2	EA	\$100,000	\$200,000
			<b>Total Traffic Items</b>	<u>\$1,458,000</u>

**SUBTOTAL SECTIONS 1-5**      \$6,256,000



**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM 1.1/1.6  
EA 0K870K  
Program Code 20.10.400.000

**Section 6 Minor Items**

	<b>Unit Cost</b>	
Subtotal Sections 1-5 <u>\$6,256,000</u> x (10%)	<u>\$625,600</u>	
<b>TOTAL MINOR ITEMS</b>		<u>\$625,600</u>

**Section 7 Roadway Mobilization**

Subtotal Sections 1-5 <u>\$6,256,000</u>		
Minor Items <u>\$625,600</u>		
SUM <u>\$6,881,600</u> x (10%)	<u>\$688,000</u>	
<b>TOTAL ROADWAY MOBILIZATION</b>		<u>\$688,000</u>

**Section 8 Roadway Additions**

Supplemental

Subtotal Sections 1-5 <u>\$6,256,000</u>		
Minor Items <u>\$625,600</u>		
SUM <u>\$6,881,600</u> x (5%)	<u>\$344,000</u>	

Contingencies

Subtotal Sections 1-5 <u>\$6,256,000</u>		
Minor Items <u>\$625,600</u>		
SUM <u>\$6,881,600</u> x (25%)	<u>1,720,000</u>	

**TOTAL ROADWAY ADDITIONS** 2,064,000

**TOTAL ROADWAY ITEMS** 9,634,000

(Total Sections 1-8)

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM      1.1/1.6  
EA      0K870K  
Program Code 20.10.400.000

**II. STRUCTURE ITEMS**

Bridge Name	<u>n/a</u>	<u>n/a</u>
	<u>                    </u>	<u>                    </u>
	<u>                    </u>	<u>                    </u>
Structure Type	<u>                    </u>	<u>                    </u>
Width (ft) (out to out)	<u>                    </u>	<u>                    </u>
Span (ft)	<u>                    </u>	<u>                    </u>
Area (sq ft)	<u>                    </u>	<u>                    </u>
Footing Type (pile/spread)	<u>                    </u>	<u>                    </u>
Cost Per Sq. Ft. (incl. 10% mobilization and 25% contingency)	<u>                    </u>	<u>                    </u>
Subtotal Structure	<u>                    </u> \$0	<u>                    </u> \$0
Demolition (incl. 10% mobilization and 25% contingency)	<u>                    </u> \$0	<u>                    </u> 0
Total Cost for Structure	<u>                    </u> \$0	<u>                    </u> \$0

**SUBTOTAL STRUCTURES ITEMS**                      \$0

Railroad Related Costs                      \$0

**TOTAL STRUCTURES ITEMS**                      \$0

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM 1.1/1.6  
EA 0K870K  
Program Code 20.10.400.000

III. RIGHT OF WAY

	Current Values		Escalation Rates %		Escalated Values*
Acquisition, including excess lands and damages to remainder (s)	\$184,560		0		\$185,000
Utility Relocations	~	~	~	~	\$100,000
Clearance / Demolition	~	~	~	~	~
RAP	~	~	~	~	~
Title and Escrow Fees	\$72,840	~	0	~	\$73,000
				TOTAL RIGHT OF WAY	<u>\$358,000</u>

CONSTRUCTION CONTRACT WORK \$0

\*Escalated to assumed year of advertising of Not escalated

Estimate Prepared By RBF Consulting Phone # (949) 472-3505

Date 2/2015

**PRELIMINARY  
PROJECT COST ESTIMATE SUMMARY**

Type of Estimate    PSR-PDS

Dist - CO - RTE

12-Ora-605

PM    1.1/1.6

EA    0K870K

Program Code 20.10.400.000

Project Description:    I-605 / Katella Ave Interchange Improvements

Limits:    In Orange County at I-605 / Katella Ave

Proposed Improvements (Scope):    Reconfigure NB Ramp Termini, Add 2nd Lane to NB Off Ramp at Mainline, Braid Southbound Ramps, Modify Lane Configurations on Eastbound and Westbound Katella Avenue between Coyote Creek Channel and Civic Center Drive

Alternative:    4 - Southbound Ramps Braid

<b>ROADWAY ITEMS</b>	<u>\$14,200,000</u>
<b>STRUCTURE ITEMS</b>	<u>\$3,100,000</u>
<b>SUBTOTAL CONSTRUCTION</b>	<u>\$17,300,000</u>
<b>RIGHT OF WAY</b>	<u>\$400,000</u>
<b>TOTAL PROJECT COST</b>	<u>\$17,700,000</u>

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM            1.1/1.6  
EA            0K870K  
Program Code 20.10.400.000

**I. ROADWAY ITEMS**

	Quantity	Unit	Unit Price	Unit Cost
<b><u>Section 1 Earthwork</u></b>				
Grading	40,000	CY	\$30.00	\$1,200,000
Fine Grading	233,900	SF	\$1.00	\$233,900
Clearing & Grubbing	10	AC	\$2,000.00	\$20,000
Develop Water Supply	1	LS	\$10,000.00	\$10,000
			<b>Total Earthwork</b>	<u>\$1,463,900</u>

<b><u>Section 2 Structural Section</u></b>				
Construct Ramp Pavement	152,000	SF	\$5.00	\$760,000
Construct Arterial Pavement	60,000	SF	\$5.00	\$300,000
Construct Curb & Gutter	4,000	LF	\$15.00	\$60,000
Construct Median Curb	200	LF	\$15.00	\$3,000
Construct PCC Sidewalk	21,900	SF	\$3.00	\$65,700
Construct Access Ramps	13	EA	\$5,000.00	\$65,000
Remove Pavement	189,800	SF	\$2.00	\$380,000
			<b>Total Structural Section</b>	<u>\$1,633,700</u>

<b><u>Section 3 Drainage</u></b>				
Large Drainage Facilites	1	LS	\$400,000.00	\$400,000
OCPW Upgrades (Katella RCB)	1	LS	\$1,120,000.00	\$1,120,000
Pumping Plants	~	~	~	\$0
Project Drainage (X-Drains, overside, etc.)	1	LS	\$450,000	\$450,000
			<b>Total Drainage</b>	<u>\$1,970,000</u>

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM           1.1/1.6  
EA           0K870K  
Program Code 20.10.400.000

	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Unit Cost</b>
<b><u>Section 4: Specialty Items</u></b>				
Retaining Walls - Type 1	9926	SF	\$150	\$1,488,900
Retaining Walls - Tie-Back	2870	SF	\$170	\$487,900
Treatment BMPs	1	LS	\$620,000	\$620,000
Job Site Management	1	LS	\$153,000	\$153,000
			<b>Total Specialty Items</b>	<u>\$2,749,800</u>

<b><u>Section 5 Traffic Items</u></b>				
Lighting	27	EA	\$5,000	\$135,000
Traffic Signals	1	EA	\$300,000	\$300,000
Permanent Signing/Striping	1	LS	\$60,000	\$60,000
Bridge Mounted Overhead Signs	0	EA	\$40,000	\$0
Overhead Sign Structures	1	EA	\$60,000	\$60,000
Traffic Control	1	LS	\$500,000	\$500,000
Ramp Metering System	3	EA	\$100,000	\$300,000
			<b>Total Traffic Items</b>	<u>\$1,355,000</u>

**SUBTOTAL SECTIONS 1-5** \$9,172,000

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM           1.1/1.6  
EA           0K870K  
Program Code 20.10.400.000

**Section 6 Minor Items**

	<b>Unit Cost</b>	
Subtotal Sections 1-5 <u>          \$9,172,000          </u> x (10%)	<u>          \$917,200          </u>	
		<b>TOTAL MINOR ITEMS   <u>          \$917,200          </u></b>

**Section 7 Roadway Mobilization**

Subtotal Sections 1-5 <u>          \$9,172,000          </u>	
Minor Items <u>          \$917,200          </u>	
SUM <u>          \$10,089,200          </u> x (10%)	<u>          \$1,009,000          </u>
<b>TOTAL ROADWAY MOBILIZATION   <u>          \$1,009,000          </u></b>	

**Section 8 Roadway Additions**

Supplemental

Subtotal Sections 1-5 <u>          \$9,172,000          </u>	
Minor Items <u>          \$917,200          </u>	
SUM <u>          \$10,089,200          </u> x (5%)	<u>          \$504,000          </u>

Contingencies

Subtotal Sections 1-5 <u>          \$9,172,000          </u>	
Minor Items <u>          \$917,200          </u>	
SUM <u>          \$10,089,200          </u> x (25%)	<u>          2,522,000          </u>

**TOTAL ROADWAY ADDITIONS             3,026,000**

**TOTAL ROADWAY ITEMS             14,124,000**

(Total Sections 1-8)

**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM 1.1/1.6  
EA 0K870K  
Program Code 20.10.400.000

**II. STRUCTURE ITEMS**

Bridge Name	<u>SB Loop On</u> <u>Ramp over</u> <u>Katella</u>	<u>SB Loop On</u> <u>Ramp over</u> <u>SB Loop Off</u>	
Structure Type	<u>cast-in-place</u>	<u>cast-in-place</u>	
Width (ft) (out to out)	<u>36</u>	<u>35</u>	
Span (ft)	<u>240</u>	<u>100</u>	
Area (sq ft)	<u>8,640</u>	<u>3,500</u>	
Footing Type (pile/spread)	<u>pile</u>	<u>pile</u>	
Cost Per Sq. Ft. (incl. 10% mobilization and 25% contingency)	<u>\$250.00</u>	<u>\$250.00</u>	
Subtotal Structure	<u>\$2,160,000</u>	<u>\$875,000</u>	
Demolition (incl. 10% mobilization and 25% contingency)	<u>\$0</u>	<u>0</u>	
Total Cost for Structure	<u>\$2,160,000</u>	<u>\$875,000</u>	
		<b>SUBTOTAL STRUCTURES ITEMS</b>	<u>\$3,035,000</u>
Railroad Related Costs			<u>\$0</u>
		<b>TOTAL STRUCTURES ITEMS</b>	<u>\$3,035,000</u>



**PRELIMINARY  
PROJECT COST ESTIMATE**

Dist - CO - RTE  
12-Ora-605  
PM 1.1/1.6  
EA 0K870K  
Program Code 20.10.400.000

III. RIGHT OF WAY

	Current Values		Escalation Rates %		Escalated Values*
Acquistion, including excess lands and damages to remainder (s)	\$187,530		0		\$188,000
Utility Relocations	~	~	~	~	\$100,000
Clearance / Demolition	~	~	~	~	~
RAP	~	~	~	~	~
Title and Escrow Fees	\$72,840	~	0	~	\$73,000
				TOTAL RIGHT OF WAY	<u>\$361,000</u>

CONSTRUCTION CONTRACT WORK \$0

\*Escalated to assumed year of advertising of Not escalated

Estimate Prepared By RBF Consulting Phone # (949) 472-3505

Date 2/2015

## **Risk Register**

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Attachment J

LEVEL 2 - RISK REGISTER				Project Name:	I-605/Katella Ave Interchange PSR-PDS			DIST- EA	12-0K870K	Project Manager	Joseph Alcock (OCTA)						
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	Construction Cost Escalation	Construction cost escalation may be greater than the 2% per year used to estimate the future cost of construction, which would lead to additional cost impacts.	Construction cost are currently escalating.	5-Very High	8 -High	40	1 -Very Low	5		Accept	Monitor and adjust cost estimates accordingly.	PM	10/29/2013	
Active	2	Threat	PM	Project Funding	As a result of fiscal constraints, funding may not be available, which would lead to scope and schedule impacts.	Measure M funding stable.	2-Low	4 -Moderate	8	16 - Very High	32		Accept	Monitor financial forecasts.	PM	10/29/2013	
Active	3	Threat	PM	Agency coordination	Permits or agency actions may take longer than expected.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Focused coordination required for "risk" agencies.	PM	10/29/2013	
Active	4	Threat	PM	Delay of Locally Preferred Alternative	The PST may not Select a Preferred Alternative in the early stages of the PA/ED phase, thus holding up the PS&E Phase.	Do not currently anticipate this being a high risk.	1-Very Low	1 -Very Low	1	4 -Moderate	4		Avoid	0	PM	10/29/2013	
Active	5	Threat	PM	Project Management	As a result of one or more circumstances such as prioritization of Renewed Measure M projects, the PA/ED, PS&E and Construction phases may be delayed, which would lead to escalated costs and schedule impacts.	Project is currently scheduled for later in the Measure M delivery schedule.	2-Low	2 -Low	4	4 -Moderate	8		Accept	Develop and escalate cost estimates according to most current version of delivery schedules.	PM	10/29/2013	
Active	6	Threat	Design	Supplemental ED	Design changes that are outside of the parameters contemplated in the Environmental Document and trigger a supplemental Environmental Document may be required, which would cause a delay due to the public comment period.	Project controversy is not anticipated.	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013	
Active	7	Threat	Design	Caltrans Involvement	As a result of limited Caltrans involvement during PID phase, there may be design changes requested in the next phase, which would lead to additional right of way and scope of work.	Development of a cooperative agreement in progress.	2-Low	2 -Low	4	4 -Moderate	8		Share	Maximize opportunities to coordinate reviews with Caltrans staff.	PM	10/29/2013	
Active	8	Threat	Design	Scope of Project	As a result of scope creep, the design may change, which would lead to additional costs and impacts to the schedule.	N/A	2-Low	2 -Low	4	2 -Low	4		Mitigate	Quickly assess design changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013	
Active	9	Threat	Design	Design Constraints	As a result of right of way and other physical constraints, design exceptions may be required for one or more of the alternatives, which would lead to schedule impacts.	Critical for early identification of design exceptions and coordination with Caltrans.	2-Low	2 -Low	4	2 -Low	4		Mitigate	Quickly assess design changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013	
Active	10	Threat	Design	Utilities	As a result refined geometrics, more accurate utility basemaps, and potholing, there may be new constraints in utility relocations that necessitate design changes and right of way acquisition, which could result in additional scope, schedule and cost impacts.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess design changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013	
Active	11	Threat	Design	FHWA	As a result of consultation with FHWA during the PA/ED phase, modified access as proposed in Alternatives 3 and 4 or a design exception related to the 13 controlling criteria: design speed, lane width, shoulder width, bridge width, horizontal alignment, vertical alignment, grade, stopping sight distance, cross slope, superelevation, horizontal clearance, vertical clearance and bridge capacity may not be approved, which would lead to additional scope and cost impacts.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess design changes and associated impacts. Coordinate with PM.	Design Manager	7/7/2014	
Active	12	Threat	Design	Geotechnical Report	As a result of identification of unsuitable pavement subgrade during the PA/ED phase, over excavation and replacement with competent material before paving may be required, which would lead to additional cost and scope impacts.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess design changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013	
Active	13	Threat	ROW	Pavement Report	As a result of the pavement report prepared during the PA/ED, a significant quantity of the existing pavement anticipated to remain-in-place may require replacement or rehabilitation, which would lead to additional cost and scope impacts.	N/A	2-Low	4 -Moderate	8	2 -Low	4		Mitigate	Quickly assess design changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013	

LEVEL 2 - RISK REGISTER				Project Name:		I-605/Katella Ave Interchange PSR-PDS		DIST- EA	12-0K870K	Project Manager	Joseph Alcock (OCTA)					
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	14	Threat	ROW	Traffic Studies	As a result of traffic studies prepared during the PA/ED phase, changes to lane configurations at ramp terminals may be necessary, which would lead to additional cost and scope impacts.	N/A	2-Low	2 -Low	4	2 -Low	4		Accept	Quickly assess design changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013
Active	15	Threat	Environmental	Challenge to ED	Potential lawsuits may challenge the environmental report, delaying the start of construction or threatening loss of funding.	Project controversy is not anticipated.	1-Very Low	2 -Low	2	16 - Very High	16		Accept	0	PM	10/29/2013
Active	16	Threat	Environmental	Nesting birds	Nesting birds, protected from harassment under the Migratory Bird Treaty Act, may be found within the project site, which could delay construction during the nesting season.	N/A	2-Low	2 -Low	4	2 -Low	4		Mitigate	Quickly assess changes and associated impacts. Project duration will include possible delay in work progress due to the nesting bird season.	PM	2/1/2015
Active	17	Threat	Environmental	Environmentally Driven Costs	As a result of the initial site assessment, environmental concerns may be identified, which may lead to costly mitigation and schedule impacts.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	18	Threat	Environmental	Drainage System Retrofits	As a result of proposed treatment BMP locations, drainage system retrofits may need to be implemented, which would lead to cost and potential schedule impacts.	N/A	2-Low	2 -Low	4	2 -Low	4		Mitigate	Quickly assess changes and associated impacts. Coordinate with PM.	Design Manager	10/29/2013
Active	19	Threat	Environmental	Public Controversy Driven Costs	As a result of public and stakeholder objections, the scope of the project may change, which would lead to delays and additional work during the next phase.	N/A	1-Very Low	2 -Low	2	16 - Very High	16		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	20	Threat	Environmental	Level of Environmental Document	As a result of studies in the PA/ED phase, the level of Environmental Document may change.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	21	Threat	Environmental	Local Agency Driven Project Changes	As a result of local agency requirements, issues may arise which would result in scope, cost and schedule impacts.	N/A	2-Low	2 -Low	4	8 -High	16		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	22	Threat	Environmental	Quantity of Runoff Treatment	As a result of the SWDR reviews, the Regional Water Quality Board and Caltrans could request 100% of the storm water runoff from the existing and proposed impervious areas to be treated, which would lead to increases in project cost.	N/A	2-Low	2 -Low	4	2 -Low	4		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	23	Threat	Environmental	Runoff Diversion	As a result of agency directives, existing city storm water currently draining into Caltrans systems may need to be diverted elsewhere, which would lead to increased project cost and scope.	N/A	3-Moderate	2 -Low	6	2 -Low	6		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	24	Threat	Environmental	Cultural Resources	As a result of archeological finds, extended Phase 1 archeological surveys and additional coordination and approvals from the State Historic Preservation Officer (SHPO) may be required, which would result in additional schedule impacts.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess changes and associated impacts. Project duration will include possible delay in work progress due to archaeological finds.	PM	2/1/2015
Active	25	Threat	Environmental	Environmental Regulation Changes	As a result of changes made to environmental regulations, plans may need to be updated during the PA/ED phase, which would result in additional cost, scope and schedule impacts.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	26	Threat	Environmental	Protected Biological Species	As a result of listed species being found within the Biological Study Area, Section 7 consultation and additional coordination and approvals from United States Fish and Wildlife Service may be required, which would result in schedule impacts.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess changes and associated impacts. Project duration will include possible delay in work progress due to protection of biological species.	PM	2/1/2015
Active	27	Threat	ROW	Delay of R/W Acquisition	Due to the residential and business parcels adjacent to the project, condemnation process may be necessary to acquire R/W, which could delay start of construction by up to one year, increasing construction costs.	N/A	2-Low	2 -Low	4	16 - Very High	32		Accept	Quickly assess changes and associated impacts. All right of way acquisitions and easements will be completed prior to start of construction.	PM	2/1/2015
Active	28	Threat	ROW	Utility Relocations	Utility relocations may require more time than planned.	N/A	2-Low	2 -Low	4	4 -Moderate	8		Mitigate	Quickly assess changes and associated impacts. All utility relocations will be completed prior of start of construction.	PM	2/1/2015

LEVEL 2 - RISK REGISTER				Project Name:		I-605/Katella Ave Interchange PSR-PDS		DIST- EA	12-0K870K	Project Manager	Joseph Alcock (OCTA)					
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	29	Threat	Construction	Buried Objects	Unanticipated buried man-made objects may be uncovered during construction, which would require removal and disposal resulting in additional costs.	N/A	1-Very Low	2 -Low	2	4 -Moderate	4		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013
Active	30	Threat	Construction	Hazardous Materials Storage	Hazardous materials may be encountered during construction, which would require an on-site storage area and potential additional costs to dispose.	N/A	1-Very Low	4 -Moderate	4	8 -High	8		Mitigate	Quickly assess changes and associated impacts.	PM	10/29/2013

## **Transportation Planning Scoping Information Sheet**

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Attachment K

# ARTICLE 4 Transportation Planning Scoping Information Sheet

## PROJECT INFORMATION

District	County	Route	Post Miles	Project ID No/ Expenditure Authorization No.
12	Ora	605	1.1/1.6	12000020230 / 0K870K

**Project Name and Description :**

**Interstate 605 (I-605) / Katella Avenue Interchange Improvements PSR-PDS**

The Orange County Transportation Authority (OCTA), in cooperation with the California Department of Transportation (Caltrans) District 12 and the City of Los Alamitos, proposes to improve the local interchange at Interstate 605 (I-605) and Katella Avenue in an effort to reduce freeway and arterial congestion, traffic congestion, and delay within the interchange area. The proposed improvements are identified as Project M in OCTA’s Renewed Measure M (Measure M2) Freeway Program. This Project Study Report-Project Development Support (PSR-PDS) includes four alternatives, including a no build alternative. The three build alternatives would modify interchange ramps and lane configurations on Katella Avenue, without altering the existing bridge structures.

**Prepared by:**

District Information Sheet Point of Contact*:	Name: RBF Consulting	Functional Unit:	Consultant
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\* The District Information Sheet Point of Contact is responsible for completing Project Information, PDT Team and Stakeholder Information, and coordinating the completion of project-related information with the Transportation Planning Stakeholders. Upon completion, provides the Transportation Planning PDT Representative and Project Manager with a copy of the Information Sheet.

Project Development Team (PDT) Information		
Title	Name	Phone Number
Project Manager (Sponsor)	Joseph Alcock	(714) 560-5372
Project Manager (RBF)	Bo Burick	(949) 855-5733
Project Engineer (RBF)	Trisha Keith	(949) 855-7049
Transportation Planning PDT Representative**	Constantino Stamation	(949) 724-2249

Transportation Planning Stakeholder Information		
Title	Name	Phone Number
Regional Planner	Maureen El Harake	(949) 724-2086
System Planner	Yatman Kwan	(949) 724-2731
Local Development- Intergovernmental Review (LD-IGR) Planner	Maureen El Harake	(949) 724-2086
Community Planner	Maureen El Harake	(949) 724-2086
Goods Movement Planner	Yatman Kwan	(949) 724-2731
Transit Planner	Maureen El Harake	(949) 724-2086
Bicycle and Pedestrian Coordinator	Yatman Kwan	(949) 724-2731

Park and Ride Coordinator	Yatman Kwan	(949) 724-2731
Native American Liaison	TBD	
Other Coordinators:	TBD	

**Project Purpose and Need\*\* –**

**Purpose**  
The purpose of the project is to improve freeway access and arterial connection, improve interchange traffic operations, enhance safety, and improve pedestrian and bicycle facilities within the project limits while minimizing adjacent right of way, environmental, and economic impacts.

**Need**  
The I-605/Katella Avenue interchange currently experiences congestion during peak periods and has existing geometric elements that do not provide needed optimal traffic operations. The interchange has a high concentration of congestion-related accidents and the interchange currently has discontinuous facilities for both pedestrians and bicycle traffic.

\*\* The Transportation Planning PDT Representative is responsible for providing the PDT with the system-wide and corridor level deficiencies identified by Transportation Planning. The PDT uses the information provided by Transportation Planning to develop the purpose and need with contributions from other Caltrans functional units and external stakeholders at the initiation of the PID and is refined throughout the PID process. As the project moves past the project initiation stage and more data becomes available, the purpose and need is refined. For additional information on purpose and need see: [www.dot.ca.gov/hq/env/emo/purpose\\_need.htm](http://www.dot.ca.gov/hq/env/emo/purpose_need.htm)

**1. Project Funding:**

a	List all known and potential funding sources and percent splits: (ie. State Transportation Improvement Program (STIP)/State Highway Operations and Protection Program (SHOPP)/Transportation Enhancement (TE)/Environmental Enhancement and Mitigation (EEM)/Safe Routes to School (SR2S)/etc.). Renewed Measure M (M2), STIP, federal, and other funding sources
b	Is this a measure project? Yes <input checked="" type="checkbox"/> /No <input type="checkbox"/> . If yes, name and describe the measure. OCTA – Renewed Measure M (M2)

**2. Regional Planning:**

a	Name of and contact information for Metropolitan Planning Organization (MPO) or Regional Transportation Planning Agency (RTPA). OCTA – Joseph Alcock, Project Manager – (714) 560-5372
b	Name of and contact information for local jurisdiction (City or County) City of Los Alamitos – Dave Hunt, City Engineer – (562) 431-3538
c	Provide the page number and project description as identified in the Regional Transportation Plan (RTP) and the date of adoption, or provide an explanation if not in RTP. SCAG RTP 2012-2035 (Adopted April 2012, Amended September 2014) - Page 236 - RTP ID 2M0719. Route I-605 from Katella On-Ramp. Description: Improve interchange.
d	Provide nexus between the RTP objectives and the project to establish the basis for the project purpose and need. The RTP’s primary goal is increasing mobility for the region’s residents and visitors. The proposed project improvements will improve operations and safety at the interchange for vehicles, pedestrians, and bicyclists, which will serve to improve mobility for all users.
e	Is the project located in an area susceptible to sea-level rise? No
f	Name of Air Quality Management District (AQMD) South Coast Air Quality Management District (SCAQMD)
g	If the project is located in a federal non-attainment or attainment-maintenance area is the project: • Regionally Significant? (per 40 (Code of Federal Regulations (CFR) 93.101) Y <input checked="" type="checkbox"/> /N <input type="checkbox"/> • Exempt from conformity? (per 40 CFR 93.126 and 93.128) Y <input type="checkbox"/> /N <input checked="" type="checkbox"/>



	<ul style="list-style-type: none"> <li>• Exempt from regional analysis? (per 40 CFR 93.127) Y <input checked="" type="checkbox"/> /N__</li> <li>• Not exempt from conformity (must meet all requirements)? Y <input checked="" type="checkbox"/> /N__</li> </ul>
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**3. Native American Consultation and Coordination:**

a	If project is within or near an Indian Reservation or Rancheria? If so, provide the name of Tribe. N/A
b	Has/have the Tribal Government(s) been consulted? Y__ /N <input checked="" type="checkbox"/> . If no, why not? N/A – project is not within or near an Indian Reservation or Rancheria.
c	If the project requires Caltrans to use right-of-way on trust or allotted lands, this information needs to be included as soon as possible as a key topic in the consultation with the Tribe(s). Has the Tribe been consulted on this topic? Y__ /N <input checked="" type="checkbox"/> . If no, why not? N/A – project would not require Caltrans to use right-of-way on trust or allotted lands.
d	Has the Bureau of Indian Affairs (BIA) been notified? Y__ /N <input checked="" type="checkbox"/>
e	Have all applicable Tribal laws, ordinances and regulations [Tribal Employment Rights Ordinances (TERO), etc.] been reviewed for required contract language and coordination? N/A
f	If the Tribe has a TERO, is there a related Memorandum of Understanding between the District and the Tribe? N/A
g	Has the area surrounding the project been checked for prehistoric, archeological, cultural, spiritual, or ceremonial sites, or areas of potentially high sensitivity? If such areas exist, has the Tribe, Native American Heritage Commission or other applicable persons or entities been consulted? Based on analysis provided within the <i>Cultural Resources Constraints for the I-605/Katella Avenue Interchange Project</i> (Cogstone Resource Management, June 2014), no archaeological sites are known within the project site. The site has been highly disturbed as part of existing roadway infrastructure and surrounding residential/commercial development. The potential for impacts to archaeological resources is considered low.
h	If a Native American monitor is required for this project, will this cost be reflected in cost estimates? Yes
i	In the event of project redesign, will the changes impact a Native American community as described above in d, e, or h? Impacts related to criteria d, e, or h are not expected in the event of a project redesign.

**4. System Planning:**

a	Is the project consistent with the DSMP? Y <input checked="" type="checkbox"/> /N__. If yes document approval date. If no, explain. The District 12 System Management Plan was completed in November 2014. This project is mentioned in Appendix D as one of the District 12 projects under the M2020 program.
b	Is the project identified in the TSDP? Y__ /N <input checked="" type="checkbox"/> ? If yes, document approval date ____. If no, explain. The Transportation System Development Program for District 12 is not available.
c	Is the project identified in the TCR/RCR or CSMP? Y__ /N <input checked="" type="checkbox"/> . If yes, document approval date __. If no, explain. Is the project consistent with the future route concept? Y <input checked="" type="checkbox"/> /N__. If no, explain. The segment of I-605 in the project vicinity is included in the CSMP Orange County SR-22 Comprehensive Performance Assessment and Causality Analysis (Draft Final, May 4, 2009) and Orange County SR-22/I-405/I-605 CSMP (Final Report, approved November 2010); however, a future route concept is not provided in either document. The SR-22/I-405/I-605 CSMP identified HOV connectors between I-405 and I-605, which were included in the traffic model for this project but will not physically impact the portion of I-605 within the project area. A TCR/RCR is not available for I-605 in District 12. For the segment of I-605 immediately north of the project, the District 7 Transportation Concept Report

	(July 2013) shows a 2035 concept with 8 mixed flow lanes and 2 HOV lanes.  This project will not alter I-605 lanes. The existing southbound inside shoulder was constructed to provide for a future HOV lane, which would be consistent with the future concept. This project will not affect this configuration.
d	Provide the Concept Level of Service (LOS) through project area.  Concept LOS was not available for I-605 within District 12. For the segment of I-605 immediately north of the project, the District 7 Transportation Concept Report (July 2013) shows a 2035 concept with LOS E.
e	Provide the Concept Facility – include the number of lanes. Does the Concept Facility include High Occupancy Vehicle lanes? Y <input checked="" type="checkbox"/> /N <input type="checkbox"/>  A Concept Facility was not available for I-605 within District 12. For the segment of I-605 immediately north of the project, the District 7 Transportation Concept Report (July 2013) shows a 2035 concept with 8 mixed flow lanes and 2 HOV lanes.
f	Provide the Ultimate Transportation Corridor (UTC) – include the number of lanes. Does the UTC include High Occupancy Vehicle Lanes? Y <input type="checkbox"/> /N <input type="checkbox"/>  The Ultimate Transportation Corridor is not available for District 12.
g	Describe the physical characteristics of the corridor through the project area (i.e. flat, rolling or mountainous terrain...)  Flat
h	Is the highway in an urban or rural area? Urban <input checked="" type="checkbox"/> /Rural <input type="checkbox"/> . Provide Functional Classification.  Interstate
i	Is facility a freeway, expressway or conventional highway?  Freeway
j	Provide Route Designations: (i.e. Interregional Transportation Strategic Plan (ITSP) High Emphasis or Focus Route, Surface Transportation Assistance Act (STAA) Route, Scenic Route...)  I-605: STAA National Network Katella Avenue: Major Strategic Highway Network (STRAHNET) connector - between interchange and Joint Forces Training Center (formerly Los Alamitos Army Airfield)
k	Describe the land uses adjacent to project limits (i.e. agricultural, industrial...)  The proposed project site is located within the City of Los Alamitos. As a roadway facility, the existing interchange does not have a land use or zoning designation based on the City's General Plan Land Use Map and Zoning Map, respectively. However, the project site is surrounded by areas with a General Plan land use designation of General Office (to the northeast), Single Family Residential (to the southeast), and Public/Quasi Public Facility (to the northwest and southwest). In addition, the site is surrounded by areas with a zoning designation of Commercial-Professional Office (to the northeast), Single-Family Residence (to the southeast), and Open Area (to the northwest and southwest).
l	Describe any park and ride facility needs identified in the TCR/CSMP, local plans, and RTP.  There are no park and ride facilities identified.
m	Describe the Forecasted 10 and 20-year Vehicle Miles Traveled (VMT), Annual Average Daily Traffic (AADT), and Peak Hour truck data in the TCR. Include the source and year of Forecast, and names and types of traffic and travel demand analysis tools used.  A TCR is not available for I-605 in District 12. For the segment of I-605 immediately north of the project, the District 7 Transportation Concept Report (July 2013) provides the following information: 2008 VMT = 916,500, 2035 VMT = 910,200 2008 AADT = 200,500, 2035 AADT = 199,000 2008 Truck Peak Hour = 900
n	Has analysis on Daily Vehicle Hours of Delay (DVHD) from the Highway Congestion Monitoring Program (HICOMP) been completed and included? Y <input type="checkbox"/> /N <input checked="" type="checkbox"/> .

	HICOMP has been replaced by Mobility Performance Report (MPR). The most recent MPR available is for 2010 – For I-605 within District 12 - Annual Vehicle Hours of Delay at 60 mph = 146,386 (2009), 241,665 (2010), Ranked 8 out of 10 for the District. Corridor vehicle delay will be evaluated during the PA/ED phase.
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**5. Local Development – Intergovernmental Review (LD-IGR) :**

List LD-IGR projects that may directly or indirectly impact the proposed Caltrans project or that the proposed Caltrans project may impact. (Attach additional project information if needed.)

LD-IGR Project Information		Project
a	County-Route-Postmile & Distance to Development.	Coordination to occur during the PA/ED phase. See Section 6 “Corridor and System Coordination” of the PSR-PDS for a list of proposed and potential developments.
b	Development name, type, and size.	To be determined during PA/ED.
c	Local agency and/or private sponsor, and contact information.	To be determined during PA/ED.
d	California Environmental Quality Act (CEQA) status and Implementation Date.	To be determined during PA/ED.
e	If project includes federal funding, National Environmental Policy Act (NEPA) status.	To be determined during PA/ED.
f	All vehicular and non-vehicular unmitigated impacts and planned mitigation measures including Transportation Demand Management (TDM) and Transportation System Management (TSM) that would affect Caltrans facilities.	To be determined during PA/ED.
g	Approved mitigation measures and implementing party.	To be determined during PA/ED.
h	Value of constructed mitigation and/or amount of funds provided.	To be determined during PA/ED.
i	Encroachment Permit, Transportation Permit, Traffic Management Plan, or California Transportation Commission (CTC) Access approvals needed.	To be determined during PA/ED.
j	Describe relationship to Regional Blueprint, General Plans, or County Congestion Management Plans.	To be determined during PA/ED.
k	Inclusion in a Regional Transportation Plan Sustainable Community Strategy or Alternative Planning Strategy?	To be determined during PA/ED.
l	Regional or local mitigation fee program in place?	To be determined during PA/ED.

**6. Community Planning:**

INITIAL PID INFORMATION	
a	Has lead agency staff worked with any neighborhood/community groups in the area of the proposed improvements? Y__/N_√_. If yes, summarize the process and its results including any commitments made to the community. If no, why not?

	Coordination with community stakeholders will take place during preparation of the environmental document in the PA/ED phase.
b	Are any active/completed/proposed Environmental Justice (EJ) or Community-Based Transportation (CBTP) Planning Grants in the project area? Y__/N_√_. If yes, summarize the project, its location, and whether/how it may interact with the proposed project. None known. Further investigation to occur during the PA/ED phase.
c	Describe any community participation plans for this PID including how recommendations will be incorporated and/or addressed. Has a context sensitive solutions (CSS) approach been applied? Y__/N_√_ A public outreach plan will be developed and implemented during the PA/ED phase. The PA/ED phase will incorporate CSS approaches.
<b>FINAL PID INFORMATION</b>	
d	How will the proposed transportation improvements impact the local community? Is the project likely to create or exacerbate existing environmental or other issues, including public health and safety, air quality, water quality, noise, environmental justice or social equity? Y_√_/N___. Describe issues, concerns, and recommendations (from sources including neighborhood/community groups) and what measures will be taken to reduce existing or potential negative effects. The project has the potential to result in environmental impacts to the local community in regards to issues such as air quality, greenhouse gases, noise, water quality, and hazardous materials; refer to the Preliminary Environmental Analysis Report (PEAR) prepared for the project.
e	Does this highway serve as a main street? Y_√_/N___. If yes, what main street functions and features need to be protected or preserved? The City of Los Alamitos has prepared the Katella and Los Alamitos Commercial Corridors Plan (dated June 30, 2010), a report with design concepts and strategies to revitalize the Katella Avenue and Los Alamitos corridors. The interchange is located at the west end of the Katella Avenue corridor. The City Civic Center is located immediately east of the interchange, at Civic Center Drive.

## 7. Freight Planning:

<b>INITIAL PID INFORMATION</b>	
a	Identify all modal and intermodal facilities that may affect or be affected by the project. I-605 is a major truck route close to the Ports of Los Angeles and Long Beach.
<b>FINAL PID INFORMATION</b>	
b	Describe how the design of this project could facilitate or impede Goods Movement and relieve choke points both locally and statewide through grade separations, lane separations, or other measures (e.g., special features to accommodate truck traffic and at-grade railroad crossings). Ramp improvements will facilitate goods movement.
c	Describe how the project integrates and interconnects with other modes (rail, maritime, air, etc.). Do possibilities exist for an intermodal facility or other features to improve long-distance hauling, farm-to-market transportation and/or accessibility between warehouses, storage facilities, and terminals? There are no rail or maritime facilities in the immediate vicinity of the project. The interchange is located approximately 1.5 miles from the Joint Forces Training Center (formerly Los Alamitos Army Airfield) and approximately 3.5 miles from Long Beach Airport. This project will improve operations at the interchange, but does not specifically address intermodal needs.
d	Is the project located in a high priority goods movement area, included in the Goods Movement Action Plan (GMAP) or on a Global Gateways Development Program (GGDP) route? Y__/N_√_. If yes, describe. N/A
e	Is the project on a current and/or projected high truck volume route [e.g., Average Annual Daily Truck Traffic (AADTT) of 5 axle trucks is greater than 3000]? Yes__/N_√_. If yes, describe how the project addresses this demand. N/A
f	If the project is located near an airport, seaport, or railroad depot, describe how circulation (including truck parking) needs are addressed.

	There are no rail or maritime facilities in the immediate vicinity of the project. This project is not anticipated to affect existing circulation at Long Beach Airport or the Joint Forces Training Center.
g	Describe any other freight issues.
	None

**8. Transit (bus, light rail, commuter rail, intercity rail, high speed rail):**

	<b>INITIAL PID INFORMATION</b>
a	List all local transit providers that operate within the corridor. OCTA – Bus – Local Route 50 and Intercounty Express 701
	Have transit agencies been contacted for possible project coordination? Y_✓_/N_. If no, why not? Project sponsor is the transit agency.
c	Describe existing transit services and transit features (bus stops, train crossings, and transit lines) within the corridor. OCTA Local Route 50 runs along Katella Avenue through the interchange, with stops just east of Civic Center Drive on both sides of the street. OCTA Intercounty Express Line 701 provides express service through the project area via Katella Avenue and I-605 to the north and east of the interchange.
	Describe transit facility needs identified in short- and long-range transit plans and RTP. Describe how these future plans affect the corridor. A Bus Rapid Transit (BRT) service along Katella Avenue between Long Beach and Orange (RTP ID S2120004) has been identified as a Strategic Project in the RTP. Such plans do not affect the improvements planned for this project.
	<b>FINAL PID INFORMATION</b>
e	Describe how the proposed project integrates transit and addresses impacts to transit services and transit facilities. The proposed project will improve operations and safety through the interchange, which serves existing transit services.
	Have transit alternatives and improvement features been considered in this project? Y_/N_✓_ If yes, describe. If no, why not? The interchange configuration and right of way constraints limit options for transit improvements, and would require extensive modifications beyond the scope of this project.
f	

**9. Bicycle:**

	<b>INITIAL PID INFORMATION</b>
a	Does the facility provide for bicyclist safety and mobility needs? If no, please explain. The proposed project will provide standard shoulders (Class III bike lanes) on Katella Avenue through the interchange. It will also eliminate free right movements at the intersection of Katella Avenue with the northbound loop exit and direct entrance ramps. Alternative 3 will eliminate the free right movement at the southbound loop entrance ramp.
	Are any improvements for bicyclist safety and mobility proposed for this facility by any local agencies or included in bicycle master plans? If yes, describe (including location, time frame, funding, etc.). The OCTA Commuter Bikeways Strategic Plan (2009) includes an existing Class III and Class I route around the interchange via Walnut Street, Catalina Street, and Coyote Creek Trail, and does not propose improvements at this location.
c	Are there any external bicycle advocacy groups and bicycle advisory committees that should be included in the project stakeholder list? If so, provide contact information. To be determined during the PA/ED phase.
	<b>FINAL PID INFORMATION</b>
d	Will bicycle travel deficiencies be corrected? How or why not?

	As noted above, the project will provide Class III bike lanes on Katella Avenue and will reduce free right turn movements.
e	How will this project affect local agency plans for bicycle safety and mobility improvements? This project will provide a link to the Coyote Creek Trail and planned bicycle lanes to the west in the City of Long Beach.
f	If the project is the construction of a new freeway or modification to an existing freeway, will it sever or destroy existing provisions for bicycle travel? If yes, describe how bicycle travel provisions will be included in this project. No, existing provisions for bicycle travel will not be severed or destroyed.

**10. Pedestrian including Americans with Disabilities Act (ADA):**

<b>INITIAL PID INFORMATION</b>	
a	Does this facility provide for pedestrian safety and mobility needs? If so, describe pedestrian facilities. Do continuous and well-maintained sidewalks exist? Are pedestrians forced to walk in the roadway at any locations due to lack of adequate pedestrian facilities? Please explain. In all build alternatives, the proposed project will provide ADA accessible sidewalk along the north side of Katella through the project area. In alternatives 2 and 4, ADA accessible sidewalk will be provided on the south side of Katella through the length of the project. In alternative 3, sidewalk will be provided from the west end of the project to the southbound entrance ramp, with a crosswalk to the north side of the street. Existing sidewalk will be removed on the south side from the southbound entrance ramp to Civic Center Drive.
b	Are pedestrian crossings located at reasonable intervals? Yes
c	Are all pedestrian facilities within the corridor ADA accessible and in compliance with Federal and State ADA laws and regulations? Pedestrian facilities will be evaluated for accessibility and ADA compliance during the PA/ED phase.
<b>FINAL PID INFORMATION</b>	
d	Will pedestrian travel deficiencies be corrected? How or why not? The proposed pedestrian improvements will close a gap between sidewalk on the Willow Street bridge over Coyote Creek Channel and the interchange.
e	How will this project affect local agency plans for pedestrian safety and mobility improvements? Alternative 3 would eliminate sidewalk on the south side of Katella Avenue between the southbound entrance ramp and Civic Center Drive to avoid pedestrian crossings at free right turn movements within that segment.
f	If the project is the construction of a new freeway or modification to an existing freeway, will it sever or destroy existing provisions for pedestrian travel? If yes, describe how pedestrian travel provisions will be included in this project. Alternative 3 would eliminate sidewalk on the south side of Katella Avenue between the southbound entrance ramp and Civic Center Drive to avoid pedestrian crossings at free right turn movements within that segment. Pedestrian travel on the south side of Katella Avenue west of the interchange is anticipated to be very minimal, as there is no existing or planned sidewalk from Studebaker Road in Long Beach to the interchange (a distance of approximately 0.9 miles) and no existing or planned destinations on the south side of Katella Avenue between Studebaker Road in Long Beach to Wallingsford Road in Los Alamitos (a distance of approximately 1.4 miles).
g	Are there any external pedestrian advocacy groups and advisory committees that should be included in the project stakeholder list? If so, provide contact information. To be determined during the PA/ED phase.
h	Have ADA barriers as noted in the District's ADA Transition Plan been identified within the project limits? If not included in the project, provide justification and indicate whether District Design coordinator approval was obtained. Per the District's ADA Transition Plan website, in a survey conducted on 6/5/2009, curb ramps within the interchange were identified with recommendations to ensure that they are constructed and/or modified in compliance with state codes and/or federal guidelines and have proper landings. All existing

	sidewalks and curb ramps within the project area will be replaced and/or removed. Further evaluation of ADA barriers will be conducted during the PA/ED phase.
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**11. Equestrian:**

INITIAL PID INFORMATION	
a	If this corridor accommodates equestrian traffic, describe any project features that are being considered to improve safety for equestrian and vehicular traffic? This corridor does not accommodate equestrian traffic.
FINAL PID INFORMATION	
b	Have features that accommodate equestrian traffic been identified? If so, are they included a part of this project? Describe. If no, why not? N/A

**12. Intelligent Transportation Systems (ITS):**

INITIAL PID INFORMATION	
a	Have ITS features such as closed-circuit television cameras, signal timing, multi-jurisdictional or multimodal system coordination been considered in the project? Y__/N_√_. If yes, describe. If no, explain. ITS features will be included and further defined during the PA/ED phase.
FINAL PID INFORMATION	
b	Have ITS features been identified? If so, are they included a part of this project? Describe. If no, why not? ITS features will be included and further defined during the PA/ED phase.