SHOPP Asset Management Pilot Request Form

SHOPPCPR: Ver 3 11/14

Submittal Date 08/14/2015

Division of Transportation Programming
State Highway Operation and Protection Program (SHOPP)

Project Manager: Leo Chen

Phone: (949) 223-5431

Dist	County	Route	Prefix	PM	Prefix	PM	EA	PPNO	Project ID
12	Orange	55		17					

☐ Includes Multiple Locations (Complete Page 2 of this Form)

MPO: SCAG

Project Location/Description (Include the nearest city, town or landmark)

This project is located in Orange County, in the City of Orange near the Lincoln Avenue/SR-91 interchange. It is proposed to construct a park and ride facility and convert the Lincoln Avenue/Santiago Boulevard intersection into a roundabout.

Need for project and proposed improvements (Elaborate using PID language)

Need:
* To reduce freeway traffic demand by building a Park and Ride facility to encourage carpooling, transit use and other modes of transportation.
* Generate electricity by installing solar panels to cover parking stalls, saving energy cost in the area.
* To provide charging stations for electric vehicles to reduce greenhouse gas and pollution.
* To eliminate peak hour queuing to the freeway from NB SR55 off-ramp to Lincoln Avenue due to the downstream signal.

PA&ED / M200	04/10/2019	R/W Cert / M410	06/01/2020	CCA / M600	04/15/2022
PS&E / M380	07/01/2020	RTL / M460	10/01/2020	END Project / M800	04/22/2023

Capital ($1,000)
(Escalated to FY of Programming)

	FY	Cost
R/W	2020/21	$0
Construction	2020/21	$10,000
	Total Capital	$10,000

Support ($1,000)

	FY	Cost
PA & ED	2018/19	$1,420
PS & E	2020/21	$2,320
R/W	2020/21	$60
Construction	2023/24	$2,000
	Total Support	$5,800

Legislative District Numbers
(Separate multiple Districts with a comma)

State Assembly	68
State Senate	37
Congressional	45,46

☐ Approved ☐ Denied

CAPITAL CONSTRUCTION COST ESCALATION RATE: 5%

District SFP (Print)	Leo Chen	District SFP (Sign)		Phone	(949) 223-5431
District Director (Print)	Ryan Chamberlain	District Director (Sign)		Phone	(949) 440-3440
SHOPP Exec. (Print)	Bassem Barsoum	SHOPP Exec. (Sign)		Phone	(949) 724-2331

SHOPP Long Lead Request Form Attachment

12 -	Orange	- 55
EA:	PPNO:	
EFIS:		

Multiple Locations Listing

Location	Perf Measure #	Performance Measure	County	Route	Prefix	PM	Prefix	PM	Bridge Number If Applicable
1		Field Elements	Orange						
2		Field Elements	Orange						
3		Field Elements	Orange		R				
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Project Initiation Report

To

Request Programming in the 2016 SHOPP

- On Interstate 5 (I-5) from PM 33.0 to PM 43.2 (10.2 mi)
- On State Route (SR 57) from PM 10.6 to PM 16.6 (6.0 mi)
- On State Route (SR 91) from PM R2.6 to PM R4.1 (.5 mi) and PM 0.0 to PM 7.2 (8.7 mi)

APPROVAL RECOMMENDED:

_____ _____

***Mike Varipapa**, PROJECT MANAGER* *DATE*

APPROVED:

_____ _____

***Ryan Chamberlain**, DISTRICT DIRECTOR* *DATE*

Vicinity Map

- On I-5 from PM 33.0 to PM 43.2 (10.2 mi)
- On SR 57 from PM 10.6 to PM 16.6 (6.0 mi)
- On SR 91 from PM R2.6 to PM R4.1 (.5 mi)
  and PM 0.0 to PM 7.2 (8.7 mi)

This report has been prepared under the direction of the following registered electrical engineer. The registered electrical engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

***Pauline Nguyen**, P.E.*
REGISTERED ELECTRICAL ENGINEER *DATE*
ELECTRICAL SYSTEMS

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1. INTRODUCTION, WORK DESCRIPTION AND SUMMARY TABLE

An Integrated Corridor Management (ICM), also known as Connected Corridors, explores how various transportation components, such as freeways, city streets, cars, buses, trucks, rails, etc. can be managed cohesively to achieve a more efficient transportation system. Building our way out of congestion by providing more freeway lanes causes a paradigm shift to a more pleasant option. It involves institutional, operational, and technical integration that provides an efficient and proactive management of traffic movement in a major transportation corridor. The goal is to reduce travel time, smoother traffic flow, less fuel consumption, lower greenhouse gas emissions, and a safe transportation facility.

In the mid-2014, Orange County's Anaheim Triangle ICM project reached an important milestone when Caltrans Headquarters elevated its priority rating to third statewide. This paved the way in advancing this project and begin engaging with our stakeholders early on in the process to meet the project schedule.

Figure 1.1: Anaheim Triangle ICM

The Anaheim Triangle ICM is the area in Northern Orange County bordered by I-5 from PM 33.0 to PM 43.2, SR 57 from PM 10.7 to PM 16.6, and SR 91 from PM R2.6 to PM R4.1 and PM 0.0 to PM 7.2. It centrally covers most of the City of Anaheim and the contiguous cities of Santa Ana, Orange, Placentia, Buena Park, Brea, Garden Grove, and Fullerton. These three corridors traverse approximately 24.8 miles in length.

The three corridors (I-5, SR 57, and SR 91) are ranked 5th, 17th, and 19th, respectively, in the State of California with the highest vehicle annual hours of delay on the I-5 of 3,300,000 hours, on SR 57 of 1,800,000 hours, and on SR 91 of 1,300,000 hours at 35mph in 2012. The statewide average hours of delay is 328,000 hours. While the triangle has very high Annual Average Daily Traffic (AADT) volumes, it also has the highest concentration of special events taking place in Orange County. The special event trip generators include worldwide travel destinations like the Disneyland Resort, the Angel Stadium, the Honda Center, the Anaheim Convention Center, the Grove of Anaheim, Knotts Berry Farm, and the Anaheim Regional Transportation Intermodal Center (ARTIC).

This project is the fourth of a series of four (4) Anaheim Triangle ICM projects within the State right of way. The Project Initiation Reports (PIRs) for the ICM projects along I-5, SR 57, and SR 91, that included Intelligent Transportation System (ITS) elements, were approved on June 17, 2015. This PIR will further address additional ITS elements and roadway items to complete the Anaheim Triangle ICM infrastructure. The whole study area is an integration of

various independent projects from various cities and with the Orange County Transportation Authorities (OCTA).

This project was initiated by the Caltrans District 12 Electrical Systems Branch. The estimated total cost for this project is $22,600,000. It is Federal/State funded through the 2018 State Highway Operation and Protection Program (SHOPP) cycle, under Program Code 20.10.201.315, for construction in the Fiscal Year 2020/2021. This is a Project Development Category 5 project because the project has minimal economic, social, or environmental significance per the Project Development Procedures Manual (PDPM), Chapter 8, and Section 5.

Project Limits	On I-5 from PM 33.0 to PM 43.2 (10.2 mi) On SR 57 from PM 10.6 to PM 16.6 (6.0 mi) On SR 91 from PM 2.6 to PM 4.1 (.5 mi) and PM 0.0 to PM 7.2 (8.7 mi)
Number of Alternatives	No build and One (1) Build Alternative
Recommended for Programming Alternative	Alternative 2
Current Capital Outlay Support Estimate	$5.50M
Current Capital Outlay Construction Estimate	$17.10 M
Current Capital Outlay Right of way Estimate	$0.00M
Funding Source	20.10.201.315
Funding Year	Fiscal Year 2020/2021
Type of Facility	Freeway
SHOPP Project Output	Field Elements
Anticipated Environmental Determination or Document	Categorical Exemption/ Categorical Exclusion
Legal Description	In Orange County and in the cities of Santa Ana, Orange, Placentia, Buena Park, Brea, Garden Grove, and Fullerton. On I-5 from PM 33.0 to PM 43.2 (10.2 mi) On SR 57 from PM 10.6 to PM 16.6 (6.0 mi) On SR 91 from PM R2.6 to PM R4.1 (1.5 mi) and PM 0.0 to PM 7.2 (7.2 mi)
Project Development Category	Category 5

2. PURPOSE AND NEED

Need:

- Anaheim Triangle ICM makes up to 60.69% of the total corridor congestion in District 12.
- Numerous special events throughout the year
- I-5, SR 57, and SR 91 are critical, regional corridors
- Travel demand and congestion continues to grow
- No ability to expand freeways, arterials, or alternate routes
- Showcase for ITS integration in the region

During either a planned or unplanned event, congestion is exacerbated mainly due to the absence of a well-orchestrated corridor management plan to address the traffic flow within the Anaheim ICM Triangle.

Purpose:

- Maintain an efficient and sustainable freeway system
- Protect investment
- Increase corridor throughput
- Improve travel time reliability
- Improve incident management
- Enable intermodal travel decisions

3. RECOMMENDATION

It is recommended that Alternative 2 as shown in Section 8 of this report be approved and advanced to Project Approval & Environmental Document (PA&ED) Phase.

4. RISK SUMMARY

The project risk register included the identified risks, qualitative risk analysis, and response strategy and risk owners/managers prepared at the Project Studies level using the ranking method. The project risk register, prepared at the Project Studies level is based on utilizing a qualitative risk analysis approach to rank the risks into high, medium and low risk categories based on their probability of occurrence and their impact on the project objectives such as schedule, cost, right of way impact, and quality.

The Risk Management Team has prepared a risk register that identifies risks to carry forward to the PA&ED phase. 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.

5. BACKGROUND

Caltrans Mission defines what we do and who we are. It aligns with the department's Vision that defines our ideals – what we aspire to be. Our goals, along with their corresponding strategic objectives and performance measures, define and quantify how we put our vision into practice and how we broaden and deepen our success.
Source: Caltrans Strategic Management Plan 2015-2020

Goal 4 **System Performance**

"Utilize leadership, collaboration, and strategic partnerships to develop an integrated transportation system that provides reliable and accessible mobility for travelers."
Source: Caltrans Strategic Management Plan 2015-2020

District 12 has selected an ICM pilot project in the Anaheim ICM Triangle as an integral project to meet System Performance, Goal #4, as laid out in Caltrans Strategic Management Plan for 2015-2020. District 12 welcomes the opportunity to partner with the cities of Anaheim, Orange, and Santa Ana as a stakeholder in proposing a regional Intelligent Transportation System (ITS) plan that utilizes existing and planned Traffic Operations System (TOS) elements. However, the City of Anaheim is strategically located within the ICM Triangle and has the most complete fiber optic backbone in place for ITS related projects – one that supplements Caltrans' complete ITS infrastructure.

The proposal plans to integrate the effort listed here along with several other previously planned projects such as fiber optic communication roll-outs, and the regional signal synchronization projects (Measure M2 Project "P") currently being executed by the OCTA. The combined efforts will provide readily executable projects which will optimize traffic flow within the vicinity of Anaheim – a city with the highest concentration of event activity in Orange County.

The communication network elements shall provide the system connectivity needed between the cities' Traffic Management Center TMC and the D-12 TMC for video and data routing and camera controls to flow between Closed Circuit Television CCTV cameras, TMS, ramp meters and traffic signal controllers and the D-12 TMC which includes the video and data monitoring and control system platform. The systems in the D-12 TMC shall be able to process the information automatically as well as under the guidance of the D-12 TMC operators.

Figure 5.1: Caltrans District 12 TMC

Figure 5.2: City of Anaheim TMC

With local partners like the cities of Anaheim, Orange, Santa Ana, and OCTA contributing to this project, the proposal could provide a showcase project utilizing State Highway Operational Protection Program (SHOPP) 315 funds readily available to supplement a complete regional solution, one that will provide high benefit low cost results to motorists in Orange County.

During a planned or unplanned special event, the primary goal of this project is to:

- Enhance safety and mobility for motorists through optimization of the existing transportation infrastructure along a corridor.
- Effective management of traffic congestion within the triangle thereby reducing travel times, delays, and fuel consumptions.
- Facilitate heavy truck traffic flow along I-5, SR 57, and SR 91.
- Enhance SR 57 Improvements.
- Provide better mobility around incidents and events resulting in an increase travel time reliability and predictability.
- Efficiently move buses along bus routes on arterials to minimize delay.
- Provide bus priority at signalized intersections.
- Provide travel time savings through triangle area.
- Disseminate information through Radio/Television and various social media networks.
- Enable travelers to make informed travel decisions and dynamically shift mode.
- Increase street capacity utilizing a regional traffic signal synchronization.
- Enhance long term commute through the triangle with well-planned detours.

The Anaheim Triangle ICM project proposes to install and modify Intelligent Transportation System (ITS) elements that provide mobility for the motorists through:

- Continuous and automated monitoring of real-time detection and Closed Circuit Television (CCTV) information.
- Recognizing and confirming extraordinary traffic situations to be addressed.
- Cooperatively managing traffic events with affected public agencies as an integrated traffic network.
- Collecting performance measures and assesses effectiveness of traffic management response.
- Communicating with users as required via Changeable Message Sign (CMS) which provide alternate routes and travel times.

- Updating traveler information infrastructure such as CMS for route guidance and travel time information dissemination.
- Updating traffic control infrastructure such as traffic signal controllers, Ethernet switches, performance measure equipment to prepare for Connected Vehicles (CV).
- Connecting the Caltrans District 12 Traffic Management Center (TMC) with the City of Anaheim TMC through fiber optic technology with fail-safe and redundant connections.
- Utilization of Adaptive Ramp Metering strategy that will build upon an intelligent algorithm into the ICM to better manage the demand dynamically through the corridor without adversely impacting the surface streets.

6. EXISTING FACILITY CONDITION

I-5 serves major trip generator of special event facilities such as the Angels Stadium of Anaheim, Disneyland Resort and Theme Park, Honda Center, and Knotts Berry Farm. In addition, within close proximity to I-5 are major medical facilities such as Anaheim Regional Medical Center, and Saint Jude Medical Center. California State University Fullerton and Fullerton College are two major learning institutions in close proximity to I-5, as well.

OCTA, Riverside Transit Agency, and Metrolink are major transit operators serving contiguous cities along I-5.

SR 57 serves major trip generator of special event facilities such as the Angels Stadium of Anaheim, Disneyland Resort and Theme Park, the Honda Center, and ARTIC. In addition, within close proximity to SR 57 are major medical facilities such as University of California Irvine (UCI) Medical Center, Anaheim Memorial Medical Center, Children's Hospital of Orange County (CHOC), and Saint Joseph Hospital. California State University Fullerton and Chapman University are two major learning institutions that are in close proximity to SR 57, as well. Just to the outskirts of SR 57 are major shopping malls; the Brea Mall and Block of Orange.

OCTA, Foothill Transit, Metrolink, and Amtrak are major transit operators serving contiguous cities along SR-57.

SR 91 serves major trip generator of special event facilities such as the Angels Stadium of Anaheim, Disneyland Resort and Theme Park, Honda Center, and Knotts Berry Farm. In addition, within close proximity to SR 91 are major medical facilities such as Anaheim Regional Medical Center, and Saint Jude Medical Center. California State University Fullerton and Fullerton College are two major learning institutions in close proximity to SR 91, as well.

OCTA, Riverside Transit Agency, and Metrolink are major transit operators serving contiguous cities along SR 91.

Corridor Geometric Information and Condition

Traffic Management System

Table 6.1: ITS Inventory

ROUTE	Closed Circuit Television CCTV	Changeable Message Signs CMS	Traffic Signals TS	Ramp Metering Systems RMS
5	15	4	22	32
57	6	4	8	16
91	10	3	12	12

Traffic Data

The Annual Average Daily Traffic (AADT) and the peak hour traffic (according to 2013 Traffic Volumes) on California State Highway System are as follows:

Table 6.2: I-5 AADT and Peak Hour Traffic Volumes

Postmile	Description	Back Peak Hour	Back AADT	Ahead Peak Hour	Ahead AADT
33.088	Santa Ana, Main Street	N/A	N/A	31,000	365,000
34.000	Santa Ana, JCT. RTES 22 and 57	31,000	365,000	19,300	286,000
34.942	Orange, Chapman Avenue	18,300	270,000	16,700	252,100
35.190	Anaheim, State College Blvd	16,700	252,100	15,500	240,000
36.258	Katella Avenue	15,500	240,000	17,200	263,900
36.606	Anaheim-Haster OC	17,200	263,900	17,400	263,900
37.400	Anaheim, Harbor Blvd	17,400	263,900	17,300	263,100
37.641	Anaheim, Ball Road	17,300	263,100	18,400	275,600
38.060	Anaheim South Street Connections	18,400	275,600	18,400	275,600
38.915	Lincoln Avenue	17,600	265000	17,900	265,000
39.511	Anaheim, Euclid Avenue	17,700	265,000	17,300	260,000
40.710	Anaheim, Brookhurst Ave	17,300	260,000	16,000	242,000

42.100	Fullerton, JCT. RTE. 91	16,000	242,000	12,800	192,000
43.133	Buena Park, Stanton Avenue Connections	12,800	192,000	12,800	192,000

Source: Caltrans 2013 Traffic volumes on California State Highways

The 2013 Daily Truck Traffic indicates the *truck percentage between 5.50% and 9.60%* between SR 57 and SR 91.

Table 6.3: SR 57 AADT and Peak Hour Traffic Volumes

Postmile	Description	Back Peak Hour	Back AADT	Ahead Peak Hour	Ahead AADT
10.830	Orange, JCT. RTE 5 and 22	N/A	N/A	21,000	244,000
11.238	Orange, Chapman Ave UC	21,000	244,000	19,800	244,000
11.798	Orangewood Avenue	20,600	253,300	20,200	250,100
12.540	Anaheim, Katella Ave	20,100	250,100	19,600	250,100
13.416	Anaheim, Ball Road	19,400	247,500	19,800	251,700
14.777	Anaheim, Lincoln Avenue	19,800	251,700	19,500	251,000
15.600	Anaheim, JCT RTE. 91	19,500	251,000	21,500	278,500
16.393	Placentia, Orangethorpe Ave	21,500	278,500	20,400	277,500

Source: Caltrans 2013 Traffic volumes on California State Highways

The 2013 Daily Truck Traffic indicates the *truck percentage of 6.14%* between SR 22 and SR 91.

Table 6.4: SR 91 AADT and Peak Hour Traffic Volumes

Postmile	Description	Back Peak Hour	Back AADT	Ahead Peak Hour	Ahead AADT
R2.615	Buena Park, JCT. RTE. 39/Beach Blvd.	N/A	N/A	19,000	263,500
R3.638	Fullerton, JCT. RTE. 5	14,200	198,500	14,300	198,500
R3.851	R Fullerton, Magnolia Blvd	14,500	198,500	18,100	248,500
R3.879	L Fullerton, Magnolia Blvd	14,300	199,000	14,400	199,000
1.232	Anaheim, Brookhurst Ave.	17,300	248,300	18,100	261,700
2.234	Euclid Ave.	18,900	273,600	19,000	273,600
3.258	Fullerton, Harbor Blvd.	19,000	273,600	18,400	265,000
3.512	Anaheim, Lemon St./Harvard Ave	18,400	265,000	18,400	265,000
4.256	Anaheim, East St.	18,400	265,000	17,900	258,000

5.258	Anaheim, State College Blvd.	17,900	258,000	17,400	253,000
6.119	Anaheim, JCT. RTE. 57	17,400	253,000	15,700	223,600
7.353	Kraemer Blvd/Glassell St.	15,600	223,500	15,100	216,000

Source: Caltrans 2013 Traffic volumes on California State Highways

The 2013 Daily Truck Traffic indicates the *truck percentage of 6.8% to 9.2%* between SR 39 and SR 57.

Roadway Geometric Information and Condition

Geometric Information

I-5 is a major north-south corridor serving local traffic, regional traffic, interstate traffic and international traffic between Mexico and Canada. It is a corridor of regional and statewide importance since it is the only major freeway corridor connecting San Diego County to Los Angeles County for commerce and daily commuters with freeway-to-freeway interchanges to State Route 73 (SR 73), Interstate 405 (I-405), State Route 55 (SR 55), State Route 22 (SR 22), SR 57, and SR 91 freeways. It is also one of the main routes to beaches and other tourist attractions in the County's coastal communities. It has four (4) to five (5) mixed flow lanes, an lane, and an auxiliary lane in each direction of travel. Current typical configuration of I-5 within the project limits is shown in Figure 6.1.

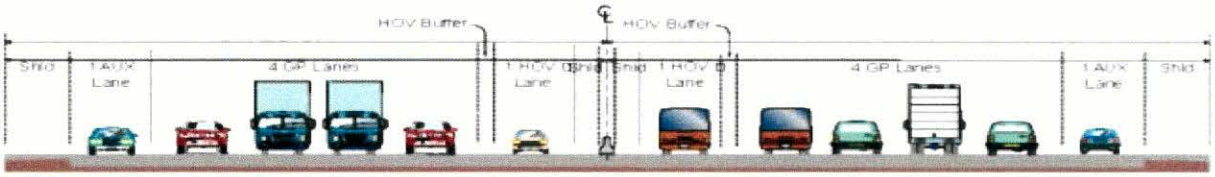

Figure 6.1: Typical I-5 Lane Configuration

SR 57, also known as the Orange Freeway is a main north/south arterial connection for Orange County, Pomona Valley and San Gabriel Valley. In addition to the daily commuters, SR 57 is also utilized by recreational users traveling to sporting and entertainment events. The design speed for the mainline SR 57 is 70 miles per hour (mi/h). SR 57, which has 8 general purpose (GP) lanes, two (2) high-occupancy vehicle (HOV) lanes, and two (2) auxiliary lanes separated by a concrete barrier at the median, begins at the "Orange Crush" Interchange and continues to northerly beyond the Los Angeles County line. With capacity improvements over a number of years, the number of lanes varies between individual segments. Typical configuration of SR 57 within the project limits is shown in Figure 6.1.

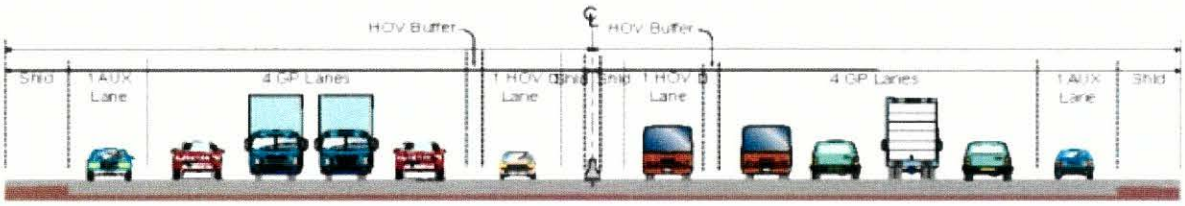

Figure 6.3: Typical SR 57 Lane Configuration

SR 91 serves major trip generator of special event facilities such as the Angels Stadium of Anaheim, Disneyland Resort and Theme Park, Honda Center, and Knotts Berry Farm. In addition, within close proximity to SR 91 are major medical facilities such as Anaheim Regional Medical Center, and Saint Jude Medical Center. California State University Fullerton and Fullerton College are two major learning institutions in close proximity to SR 91, as well.

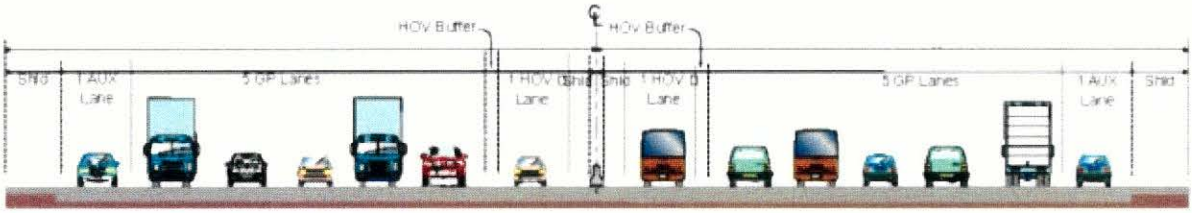

Figure 6.1: Typical SR 91 Lane Configuration

Geometric Condition

On I-5:

PMS Category (1-99): 9
Priority Classification (0.1-0.4): 0.3
International Roughness Index (IRI): Max: 288 ; and Average: 145
Rigid Pavement: Yes
Flexible Pavement: No
3rd Stage Cracking %: 0%
Alligator B Cracking %: N/A
Faulting %: N/A
Patching %: N/A
Joint Spalls: N/A
Rutting: N/A
Pumping: N/A
Bleeding: N/A
Corner Breaks %: 0%
Raveling: N/A

On SR 57:

PMS Category (1-99): 9
Priority Classification (0.1-0.4): 0.3
International Roughness Index (IRI): Max: 261 ; and Average: 153
Rigid Pavement: Yes
Flexible Pavement: No

3rd Stage Cracking %: 0%
Faulting %: Yes
Joint Spalls: No
Pumping: N/A
Corner Breaks %: 0.19%

Alligator B Cracking %: N/A
Patching %: N/A
Rutting: N/A
Bleeding: N/A
Raveling: N/A

On SR 91:

PMS Category (1-99): 9
Priority Classification (0.1-0.4): 0.3
International Roughness Index (IRI): Max: 238 ; and Average: 132
Rigid Pavement: Yes
Flexible Pavement: No
3rd Stage Cracking %: 0%
Alligator B Cracking %: N/A
Faulting %: No
Patching %: N/A
Joint Spalls: No
Rutting: N/A
Pumping: No
Bleeding: N/A
Corner Breaks %: 0%
Raveling: N/A

7. CORRIDOR AND SYSTEM COORDINATION

Coordination with other planned and programmed improvement projects being proposed at I-5, SR-57, and SR-91 near this project is required. The proposed projects are shown as follows:

Table 7.1: Programmed Improvement Projects on I-5

EA	PM	LOCATION	DESCRIPTION
0N280	33.7/33.7	Main/Broadway	Groove PCC
0N640	34.5/37.4	SR-22 to Harbor Blvd.	Groove PCC
0P390	35.0/35.0	State College Blvd./The City Drive	Modify existing signals
0N080	33.3/34.5	I-5/SR-22/SR-57	Roadside worker safety
0N510	31.0/33.3	Fourth Street to Main Street	Roadside worker safety
0H234	23.8/23.8	Sand Canyon Avenue	ATMS
0N220	23.8/23.8	Sand Canyon Avenue	TMC
0C510	34.1/34.1	Gene Autry Way	Construct UC
0C890	30.3/34.0	Junction SR-55 to Junction SR-22	Construct 2nd HOV Lane
0M170	35.0/35.0	Chapman Avenue	Install safety lighting, ADA
0M270	36.1/36.1	Katella Avenue/Manchester Blvd.	Install safety lighting, ADA
0M370	4.4/44.4	Avenida Vista Hermosa to OC/LA County Line	Safety cable
0M530	36.0/36.0	Katella Avenue	UC widening
0M730	5.0/34.0	Camino de Estrella to Junction SR-22	Seal bridge deck

0M840	16.5/42.0	La Paz Road to Magnolia Avenue	Maintenance electrical signs
0N030	13.5/34.0	Crown Valley Pkwy to Junction SR-22	Remove/replace lighting
0N770	35.0/35.0	State College Blvd./The City Drive	Irrigation Controller Upgrade
0N950	29.1/42.5	Red Hill Avenue to Orangethorpe Ave.	Replace striping seal

Table 7.2: Programmed Improvement Projects on SR-57

EA	PM	LOCATION	DESCRIPTION
0F03U	16.2/21.1	Orangethorpe to Lambert Road	Replacement planting
0M970	11.5/12.5	Orangewood Ave. to Katella Ave.	Northbound widening
0F031	16.2/18.6	Orangethorpe Ave to Yorba Linda Blvd.	CMIA Central Segment
0F04A	12.5/15.2	Katella Ave to Lincoln Ave	Replacement planting
0F040	12.2/15.2	Orangewood Ave to La Palma Ave	CMIA south segment
0L090	11.0/22.5	Chapman Ave to LA County Line	PCC profile grinding
0L340	14.9/14.9	Lincoln Avenue	Install MBGR/ Misc. Paving
0M160	13.4/14.8	Ball Road to Lincoln Avenue	ADA improvements
0M220	11.8/13.4	Orangewood Ave to Ball Road	ADA improvements
0M380	11.9/12.9	Orangewood Ave to Douglass OH	Repair bridge deck
0M620	15.3/15.9	SR-91/SR-57 Interchange	Additional safety lighting
0N340	10.8/21.8	SR-22 to Tonner Canyon Road	Concrete bridge deck
0N580	14.9/15.2	Lincoln Ave to La Palma Ave.	Install guide/regulatory signs
0P450	11.0/22.5	JCT 22 to LA County Line	Grind and groove slabs

Table 7.3: Programmed Improvement Projects on SR-91

EA	PM	LOCATION	DESCRIPTION
0N360	1.0/5.4	Valley View and State College	Modify signal and lighting
0N090	11.5/12.5	SR-57/SR-91 Interchange	Roadside worker's safety
0H243	0.0/2.8	LA/OC County Line to Euclid Ave.	Install fiber optic line
0K980	6.0/9.3	SR-57 to SR-55	Mainline widening I/C improvements
0C571	0.9/5.4	Brookhurst Street to State College Blvd.	Replacement planting
0C570	0.9/5.4	Brookhurst Street to State College Blvd.	Aux lane conversion to GP
0H029	0.0/10.1	SR-55 to LA County Line	Pavement rehabilitation

0L750	0.31/0.31	Orangethorpe Avenue	Shoulder widening
0M400	0.0/2.8	LA/OC County Line to Euclid Ave.	Roadside worker's safety
0P510	2.6/2.8	WB off ramp to Beach Blvd.	Ramp widening

The proposed improvements are consistent with the November 2014 District System Management Plan (DSMP) Congestion Management and Operational Improvements strategy, Southern California Association of Government's (SCAG's) 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy, Orange County Transportation Authority (OCTA) 2014 Long Range Transportation Plan (LRTP), and Federal Highway Administration Moving Ahead for Progress in the 21st Century Act (MAP-21). Moreover, although the current SR 91 Corridor System Management Plan (CSMP) is focused on reducing congestion and increasing mobility, the report acknowledges Caltrans support of bicyclists, pedestrians, and transit users through the policy of "Complete Streets" DD-64-R1.

Further coordination with local cities shall be maintained and is necessary for information and to enhance consistency with their plans.

8. ALTERNATIVES

ALTERNATIVE 1 – NO BUILD ALTERNATIVE

This "No Build" Alternative retains the existing condition of the facility. During an unplanned event, the traveling public will continue to experience the "parking lot scenario" on the freeway, additional freeway traffic flow diverting into the arterial streets causing, and likely causing further accidents. It does not satisfy the need and purpose of the project and is not recommended.

ALTERNATIVE 2 – RECOMMENDED FOR PROGRAMMING ALTERNATIVE

FIELD ELEMENTS:

- Install new Caltrans HD CCTV cameras on new poles and modify existing CCTV cameras to HD CCTV cameras using existing poles.
- Modify existing Caltrans CMS on existing structure.
- Install Network Switches IP on existing cabinets.
- Install Model 2070 Traffic Controllers for Video Distribution System at Hubs.
- Install Fiber Optic Connections to Anaheim at 3 Demarcation Points.
- Install CCTV cameras on existing poles located at Caltrans Traffic Signal Intersections and on-ramps.
- Install Network Control System on existing Caltrans Lighting poles.

Figure 7.1: Model 2070 Traffic Controller

Figure 7.2: Sample HD CCTV Camera

- Install Performance Measure Data Collection Device (Bluetooth, Wi-Fi) on existing poles.
- Install Landscape Water Usage Control System.
- Install Vehicle to Roadside Communications on existing cabinets.

OTHER LOCATIONS:

- Install CMS Control System for remote control of Anaheim TMC.
- Install Trickle Charging Stations at Caltrans Maintenance Yards.

ROADWAY ELEMENTS:

- Upgrade all sign panels to a Type 11 super-reflective sign panel.
- Utilize a 5-year warranty pavement striping alternative.
- Repair of damaged landscapes.
- Provide additional Maintenance Vehicle Pullouts (MVP) and rehabilitate existing.
- Identify and upgrade safety devices.
- Upgrade American Disability ACT (ADA) facilities at ramp intersections.

9. LIFE CYCLE COST ANALYSIS AND ASSET MANAGEMENT

Caltrans District 12 and the City of Anaheim prepared a cost benefit analysis for the proposed project. The goal is to initially estimate the overall costs of the proposed alternatives and to select the improvement that will ensure the lowest overall cost of ownership consistent with its quality and intended function.

Based on the total construction capital cost of the project, a benefit cost ratio of 2.07 was obtained utilizing the following assumptions:

- 10 year investment life
- 10% annual maintenance and replacement cost
- 2% annual benefit increase
- Average value of money is $10 USD per hour

10. ENVIRONMENTAL COMPLIANCE

Effective October 1, 2012, Caltrans entered into a memorandum of understanding pursuant to 23 USC 327 National Environmental Policy Act Assignment Memorandum of Understanding (NEPA MOU) with Federal Highways Administration (FHWA), through which Caltrans continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been carried out by Caltrans under its assumption of responsibility pursuant to 23 USC

327. For this project, Caltrans is the NEPA Lead Agency. Caltrans anticipates a Categorical Exclusion (CE) for this project. Caltrans is also the Lead Agency and will provide compliance for the California Environmental Quality Act (CEQA). Caltrans anticipates a Categorical Exemption (CE) for this project.

Air Quality
Until the project is included in the Federal Transportation Improvement Program (FTIP), we cannot determine if it can be exempted from Air Quality Conformity Analysis. Project might qualify as a Traffic Signal Synchronization Project. According to Title 40 CFR 93.128, this project must be included in the FTIP.

Biology
Either a Natural Environmental Study (NES) or NES-Minimal Impacts is needed including General flora and fauna surveys, Bat assessments/surveys and Jurisdictional delineation. [Note: During PS&E, Bat Surveys, Bird Surveys, Project Regulatory permitting – USACE 404, RWQBCB 401, CDFW SAA 1600 are required. Permit required compensatory mitigation. Construction/pre-construction – Nesting bird surveys and Wildlife exclusions, i.e., bats/birds in/on structures being impacts will be required.

Cultural
Either a "Screened Undertaking" Memo or a Historic Property Survey Report (HPSR) will be required.

Hazardous Waste
Aerially Deposited Lead (ADL) investigation will be required. Should restriping be needed, material from removal of yellow thermoplastic or paint may contain lead and should be tested.

Water Quality
A Water Quality Assessment (Memo/Report) may be necessary.
Task Order(s) (232 Funds) are likely to be required to complete some of the technical studies.

Technical studies will be utilized to validate anticipated NEPA and CEQA Class of Action (CE/CE). Changes to Scope, Cost or Schedule could require further additional environmental analysis. An Environmental Commitment Record (ECR) is required."

11. RIGHT OF WAY

Discussion for this topic is not required by the guidelines.

12. STORM WATER

Discussion for this topic is not required by the guidelines.

13. TRAFFIC MANAGEMENT PLAN

The cost of traffic management is shown as a separate item in the cost estimate. A Traffic Management Plan (TMP) would be required for this project in PA&ED phase due to the expected impact on traffic during construction. The TMP would identify methods to reduce traffic delay, maintain traffic flow through I-5, SR 57, SR 91, along the City of Anaheim local street network, and provide a safe environment for the work force and motoring public. A traffic analysis should be performed as part of the TMP in order to evaluate the potential impact that the project will have on traffic and identify the benefit of implementing a TMP. Elements expected to be recommended or discussed in the project TMP include:

- Public Awareness Campaign
- Detour or Alternative Routes with signing
- Fixed and Portable CMS
- Traffic Signal Modifications (if applicable)
- TMC
- Highway Advisory Radio
- COZEEP/CHP Support
- Freeway Service Patrol
- Traffic Management Team
- TMP Coordination & Review
- Coordination with local city during construction closures

14. OTHER CONSIDERATION

Performance Improvement

This ICM project allows improving and building upon the existing field elements and their communication infrastructure on SR 57. The project will bring field data from the freeway system and impacted arterials to the Caltrans District 12 Transportation Management Center. These data will also be shared with the cities' Traffic Operation Center, which allows system interoperability between Caltrans District 12 and the various cities. Through real time traffic data sharing between Caltrans and the contiguous cities, congestion will be managed in a faster and more cooperative manner.

The shared data will consist of CCTV video streams, traffic volume and speeds on the freeway mainline, and on-ramp and off-ramp volumes, as well as real time messages on CMS. Through utilization of technology and data sharing, both agencies will be able to proactively monitor, promptly verify and respond to incidents and manage congestion, in order to reduce traffic build-up and related adverse impacts. This approach will alleviate any latency in verification and response; whereas, it is worthwhile to note that, in general, every seven minutes delay in response to an incident there will be an additional mile of

queue on the system. This proactive approach to the traffic management system will improve the safety of commuters and the reliability of the system during the normal operation and during special events. The real time traffic data enhanced by this joint operation will provide additional advisory information to the commuter through the CMS subsystem, go-511 system and other traveler information service providers including social media.

The interoperability of the ITS between Caltrans and the Anaheim operation centers will enhance the fail-safe system through redundancy in managing incidents and congestion during normal operations and special events. This cooperative effort will assure the optimization of the system capacity through early warning and advanced system management and diversion of traffic.
The performance evaluation of this project can be measured objectively through congestion monitoring via the Advanced Transportation Management System before and after the ICM project. Some key performance metrics used to determine the effectiveness of the strategy can include:

- Annual Travel Time Savings (Person-Hours)
- Improvement in the Travel Time Reliability (Reduction in Travel Time Variance)
- Gallons of Fuel Saved Annually
- Tons of Mobile Emissions Saved Annually
- 10-Year Net Benefit
- 10-Year Cost
- Benefit-Cost Ratio

Concept of Operations

Concept of operations, technically referred to as CONOPS, will be developed in the PA&ED Phase. It will explore various scenarios that will be developed and further evaluated for system performance given that certain events were to occur. It is essential that the CONOPS will clearly define the roles and responsibilities of the involved agencies and other involved entities. Flow charts and other visual aids will be employed to clearly map the strategies involved given a scenario.

CONOPS is a planning tool that aids an organization to simply document a proposed project in terms of what is required and what should be built for an information system. It will answer the following questions:

- **WHAT** – the known elements and the high-level capabilities of the system.
- **WHERE** – the geographical and physical extents of the system.
- **WHEN** – the time-sequence of activities that will be performed.
- **HOW** – resources needed to design, build, operate, and maintain the system.
- **WHO** – the stakeholders involved with the system, and their respective responsibilities.

- **WHY** – justification for the system, identifying what the corridor currently lacks, and what the system will provide.

An effective CONOPS provides several benefits such as:

- Providing a means for engaging ICM stakeholders and soliciting their input as to their respective desires, visions, and expectations (without requiring them to provide quantified, testable specifications), as well as their thoughts and concerns on possible solution strategies.
- Providing a means of describing stakeholders' operational needs for ICM, without bogging down in detailed technical issues.
- Identifying the institutional, technical and operational environment in which ICM will function.
- Formulating and documenting high-level definitions and descriptions of integrated corridor management system and any changes to the associated network systems.

To ensure that the system is being built according to plan and will meet the recorded and expected goals, it is important to engage all the stakeholders early on in the process to obtain their buy-in and support as the project moves forward.

15. FUNDING, PROGRAMMING AND ESTIMATE

The Capital Outlay Project Estimate for the proposed project is $36,900,000. It does not include any Capital Outlay Support Cost, shown in the Table 14.1. Funding for all phases of project development will be resourced through the State Highway Operations and Protection Plan (SHOPP) 2014 Cycle under SHOPP program code 20.10.201.315, Traffic Management Systems, for Fiscal Year 2017/2018. It has been determined that this project is eligible for Federal-aid funding.

Table 14.1: Capital Outlay Support and Project Estimates

COMPONENTS	FISCAL YEAR ESTIMATE (x $1,000,000)				TOTALS
	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	
PA&ED Support					
PS&E Support					
R/W Support					

Construction Support					
Total Support Cost					
Right-of-Way Cost					
Construction Cost					
Total Capital Cost					
Total Project Cost					

The support cost ratio is **32.2%.**

16. DELIVERY SCHEDULE

Project Milestones		Milestone Date (Month/Day/Year)
BEGIN ENVIRONMENTAL	M020	
PA & ED	M200	
PROJECT PS&E	M370	
RIGHT OF WAY CERTIFICATION	M410	
READY TO LIST	M460	
AWARD	M495	
APPROVE CONTRACT	M500	
CONTRACT ACCEPTANCE	M600	

17. EXTERNAL AGENCY COORDINATION

This project is considered to be an Assigned Project in accordance with the current FHWA and Caltrans Joint Stewardship and Oversight Agreement.

The project requires the following coordination with the following resource and regulatory agencies during PA&ED:

- California Department of Fish and Wildlife Streambed Alteration 1602 Agreement.
- U.S. Army Corps of Engineers Section 404 Permit.
- Regional Water Quality Control Board Section 401 Certification
- U.S. Fish and Wildlife Service (USFWS), Section 7 of the Federal Endangered Species Act
- CDFW, Section 2080.1 or 2081(b) of the California Fish and Game

Coordination with the following local agency is required during construction:

- City of Anaheim
- City of Buena Park
- City of Brea

- City of Fullerton
- City of Orange
- City of Santa Ana
- City of Placentia

18. PROJECT REVIEWS

Scoping team field review Date: August 5, 2014

Ferdinand Agbayani (Advance Planning – Project Studies)
Constantino Stamation (Advance Planning – Project Studies)
Pauline Nguyen (Electrical Systems)
Kathleen Dove (Environmental Planning)
Hector Salas (NPDES Unit)
Paul Chang (Environmental Engineering)
Bassem Barsoum (Traffic Operations – North)
John Thai (City of Anaheim)

District Program Advisor: *Fedrico Hormozi* Date: September 16, 2014

HQ SHOPP Program Advisor: *Kien Le* Date: September 16, 2014

Project Manager: *Mike Varipapa* Date: September 16, 2014

Other: *John Thai (City of Anaheim)* Date: August 26, 2014

19. PROJECT PERSONNEL

Personnel	Title	Phone Number
Gary Slater	Branch Chief, Traffic Operations North	(949) 756-7685
Bassem Barsoum	Traffic Area Engineer	(949) 724-2331
Mike Varipapa	Caltrans Project Manager	(949) 756-7607
Fedrico Hormozi	Program Advisor	(949) 936-3464
Constantino Stamation	Branch Chief, Project Studies	(949) 756-2249
Ferdinand Agbayani	Project Engineer, Project Studies	(949) 724-2694
Pauline Nguyen	Project Engineer, Electrical Systems	(949) 936-3484
Mili Lim Stamation	Branch Chief, Design Branch A	(949) 724-2167
Smita Deshpande	Senior Environmental Planner	(949) 724-2245
Kathleen Dove	Associate Environmental Planner	(949) 724-2527
Grace Pina-Garret	Branch Chief, NPDES Coordinator	(949) 724-2189
EvangelinaWashington	Branch Chief, Right of Way Coordinator	(949) 724-2515

Bryan Sorensen	District Safety Program Advisor, Traffic Studies Branch	(949) 724-2883
John Thai	City of Anaheim	(714) 765-5162

20. ATTACHMENTS (6 PAGES)

A. Cost Estimates
B. Risk Register

ATTACHMENT A
Cost Estimate

PROJECT INITIATION REPORT COST ESTIMATE SUMMARY

Dist-Co-Rte:	12 - ORA – 5, 57, 91
PM:	5 (PM 33.0/43.2), 57 (PM 10.6/16.6), 91 (PM R2.6/R4.1 & 0.0/7.2)
EA:	EA 0P670K
Project Number:	1215000160
Prgm. Code:	20.10.201.315

PROJECT DESCRIPTION:

Limits:

- On I-5 from PM 33.0 to PM 43.2 (10.2 mi)
- On SR-57 from PM 10.6 to PM 16.6 (6.0mi)
- On SR-91 from PM R2.6 to PM R4.1 (.5 mi) and PM 0.0 to PM 7.2 (8.7 mi)

Proposed Improvement (Scope): Install and connect proposed Caltrans ITS infrastructure with the City of Anaheim as part of the Anaheim Triangle Integrated Corridor Management program. Provide mobility for motorists using Integrated Corridor Management (ICM) to update the freeway and city transportation infrastructures for effective management of traffic congestion during planned and unplanned special events.

BUILD ALTERNATIVE:

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$17,127,214
TOTAL STRUCTURE ITEMS	$0
SUBTOTAL CONSTRUCTION COSTS	$17,127,214
TOTAL RIGHT OF WAY ITEMS	$0
TOTAL PROJECT CAPITAL OUTLAY COSTS	$17,127,214
ESTIMATED SUPPORT COST	$5,480,709
	$22,607,923
USE	**$22,600,000**

PROJECT INITIATION REPORT COST ESTIMATE SUMMARY

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost	Section Cost
Excavation	0	LS	$57,600	$0	
				Subtotal Earthwork	$0
Section 2 Structural Section					
Minor Concrete	0.0	CY	$1,500	$0	
				Total Structural Items	$0
Section 3 Drainage					
Misc Drainage	0	LS	$0	$0	
				Total Drainage	$0
Section 4 Specialty Items					
Maintain Existing Planted Areas	1	LS	$3,250	$3,250	
Prepare Water Pollution Control	1	LS	$1,600	$1,600	
Job Site Management	1	LS	$27,985	$27,985	
Additional Water Pollution Control	1	LS	$7,500	$7,500	
Progress Schedule	1	LS	$3,850	$3,850	
Rehabilitate Damaged Landscape	1	LS	$550,000	$550,000	
				Total Specialty Items	$594,185
Section 5 Traffic Items					
Network Switches	1	LS	$435,000	$435,000	
Model 2070 Traffic Signal Controller	1	LS	$275,000	$275,000	
Video Distribution System	1	LS	$230,000	$230,000	
Fiber Optic Link	1	LS	$320,000	$320,000	
CCTV Freeway Cameras	1	LS	$230,000	$230,000	
CCTV Intersection Cameras	1	LS	$600,000	$600,000	
CCTV Signalized On-ramp Cameras	1	LS	$625,000	$625,000	
Communication/Control System	1	LS	$530,000	$530,000	
Trickle Charging Station	1	LS	$230,000	$230,000	
Landscape Water Usage Control System	1	LS	$130,000	$130,000	
Vehicle to Roadside Communication	1	LS	$350,000	$350,000	
Adaptive Ramp Metering System	1	LS	$1,100,000	$1,100,000	
System Integration	1	LS	$550,000	$550,000	
Modify CCTV Cameras	1	LS	$270,000	$270,000	
Modify CMS	1	LS	$130,000	$130,000	
Resident Engineers Office	1	LS	$21,500	$21,500	
Traffic Management Plan	1	LS	$230,000	$230,000	
Overhead Sign (2 Posts)	115	EA	$15,000	$1,725,000	
Overhead Sign (2 Posts)	17	EA	$25,000	$425,000	
Traffic Striping	1	LS	$660,000	$660,000	
Maintenance Vehicle Pullouts	1	LS	$500,000	$500,000	
Upgrade of Safety Devices	1	LS	$1,500,000	$1,500,000	
				Total Traffic Items	$11,066,500

PROJECT INITIATION REPORT COST ESTIMATE SUMMARY

Section 6 Minor Items						
	Subtotal Sections 1-5	$11,660,685	X	8% (5% - 10%)	$932,855	
					Total Minor Items	$932,855
Section 7 Roadway Mobilization						
	Subtotal Sections 1-6	$12,593,540	X	8% (10%)	$1,007,483	
					Total Roadway Mobilization	$1,007,483
Section 8 Roadway Additions						
Supplemental Work						
	Subtotal Sections 1-6	$12,593,540	X	8% (5% - 10%)	$1,007,483	
Contingencies						
	Subtotal Sections 1-6	$12,593,540	X	20% (15%-25%)	$2,518,708	
					Total Roadway Additions	$3,526,191
					TOTAL ROADWAY ITEMS (Total of sections 1-8)	**$17,127,214**
II. STRUCTURE ITEMS					**TOTAL STRUCTURE ITEMS**	$0
III. RIGHT OF WAY						
		Current Values (Future Use)		Escalation Rates	Escalated Values	
Acquisition, Including excess Lands, damages and Goodwill						
Potholing Utilities		$0		20%	$0	
Title and Escrow Fees						
					Total Right of Way	$0
					TOTAL RIGHT OF WAY (Current Value)	**$0**

ATTACHMENT B
Risk Register

LEVEL 2 - RISK REGISTER				Project Name:	12-0N900 - The Anaheim Triangle ICM Project		DIST- EA	12-0N900	Project Manager	Mike varipapa						
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	12-0N900_01	Threat	Design	Limited expert Design consultants in this field	Due to limited pool of expertise in this field, the selection process may be arduous		3-Moderate	2 -Low	6	2 -Low	6				Fedrico Hormozi	9/3/2014
Active	12-0N900_02	Threat	Design	CT staff	Due to the uniqueness and specialty of this project, expert staff may not be available to work on this project		4-High	4 -Moderate	8	4 -Moderate	12				Fedrico Hormozi	9/3/2014
Active	12-0N900_03	Threat	Design	Safety Review	Defer Safety Review by the Safety Review Committee to PA&ED Phase due to compressed schedule		3-Moderate	2 -Low	6	2 -Low	6		Mitigate	Funding and Schedule will be adjusted during PA&ED phase to address safety review comments from Safety Review Committee	Fedrico Hormozi	9/3/2014

Envision Rating System
Self-Assessment Checklist
For Public Comment Only - Not for Project Use

Project:

Sustainability Goal points minimally includes Green Assessment Questions on 5 Tabs (Quality of life, Leadership, Resource Allocation, Natural World, and Climate & Risk). One point is earned for each "Yes" Answer (50 points possible) and bonus points for additional question may be considered (93 additional points). Projects will be ranked for the Sustainability Goal based on these points.

			Caltrans G3 PM's		Y	N	NA		
1	QUALITY OF LIFE	PURPOSE	Livability	QL1.1 Improve community quality of life	3	0	0	3 of 3	NA 8% No 0%
2			Livability	QL1.2 Stimulate sustainable growth and development	3	0	0	3 of 3	
3			Livability	QL1.3 Develop local skills and capabilities	3	0	0	3 of 3	
4		COMMUNITY	Health & Safety	QL2.1 Enhance public health and safety	1	0	0	1 of 1	
5			Noise Pollution	QL2.2 Minimize noise and vibration	1	0	0	1 of 1	
6			Light Pollution	QL2.3 Minimize light pollution	1	0	0	1 of 1	
7			Livability	QL2.4 Improve community mobility and access	3	0	0	3 of 3	Yes 92%
8			Mode Shift	QL2.5 Encourage alternative modes of transportation	2	0	0	2 of 2	
9			Accessibility	QL2.6 Improve site accessibility, safety and wayfinding	3	0	0	3 of 3	
10		WELLBEING	Cultural Resources	QL3.1 Preserve historic and cultural resources	0	0	2	0 of 0	
11			Livability	QL3.2 Preserve views and local character	2	0	0	2 of 2	
12			Livability	QL3.3 Enhance public space	2	0	0	2 of 2	
				TOTAL	**24**	**0**	**2**	24 of 24	
13	LEADERSHIP	COLLABORATION	Community Partnership	LD1.1 Provide effective leadership and commitment	3	0	0	3 of 3	NA 0%
14			Community Partnership	LD1.2 Establish a sustainability management system	1	0	0	1 of 1	
15			Community Partnership	LD1.3 Foster collaboration and teamwork	3	0	0	3 of 3	
16			Community Partnership	LD1.4 Provide for stakeholder involvement	3	0	0	3 of 3	Yes 100 %
17		MANAGEMENT	Resource Consumption	LD2.1 Pursue by-product synergy opportunities	1	0	0	1 of 1	
18			Community Integration	LD2.2 Improve infrastructure integration	3	0	0	3 of 3	
19		PLANNING	Environmental	LD3.1 Plan for long-term monitoring and maintenance	2	0	0	2 of 2	
20			Community Partnership	LD3.2 Address conflicting regulations and policies	2	0	0	2 of 2	
21			Energy	LD3.3 Extend useful life	1	0	0	1 of 1	
				TOTAL	**19**	**0**	**0**	19 of 19	
22	RESOURCE ALLOCATION	MATERIALS	Resource Consumption	RA1.1 Reduce Net Embodied Energy	2	0	0	2 of 2	
23			Resource Consumption	RA1.2 Support Sustainable Procurement Practices	3	0	0	3 of 3	NA 32%
24			Resource Consumption	RA1.3 Use Recycled Materials	2	0	0	2 of 2	
25			Resource Consumption	RA1.4 Use Regional Materials	2	0	0	2 of 2	No 0%
26			Resource Consumption	RA1.5 Divert Waste from Landfills	1	0	2	1 of 1	
27			Resource Consumption	RA1.6 Reduce Excavated Materials Taken off Site	3	0	0	3 of 3	
28			Resource Consumption	RA1.7 Provide for Deconstruction and Recycling	3	0	0	3 of 3	
29		ENERGY	Energy	RA2.1 Reduce energy consumption	3	0	0	3 of 3	
30			Energy	RA2.2 Use renewable energy	2	0	0	2 of 2	Yes 68%
31			Energy	RA2.3 Commission and monitor energy systems	3	0	0	3 of 3	
32		WATER	Water	RA3.1 Protect fresh water availability	4	0	3	4 of 4	
33			Water	RA3.2 Reduce potable water consumption	0	0	4	0 of 0	
34			Water	RA3.3 Monitor water systems	0	0	4	0 of 0	
				TOTAL	**28**	**0**	**13**	28 of 28	
35	NATURAL WORLD	SITING	Environmental	NW1.1 Preserve prime habitat	2	0	3	2 of 2	
36			Environmental	NW1.2 Protect wetlands and surface water	2	0	1	2 of 2	NA 30%
37			Environmental	NW1.3 Preserve prime farmland	1	0	0	1 of 1	
38			Environmental	NW1.4 Avoid adverse geology	3	0	0	3 of 3	No 0%
39			Environmental	NW1.5 Preserve floodplain functions	3	0	3	3 of 3	
40			Environmental	NW1.6 Avoid unsuitable development on steep slopes	0	0	2	0 of 0	
41			Environmental	NW1.7 Preserve greenfields	2	0	0	2 of 2	
42		LAND & WATER	Water Pollution	NW2.1 Manage stormwater	2	0	0	2 of 2	
43			Pollution	NW2.2 Reduce pesticide and fertilizer impacts	1	0	4	1 of 1	Yes 70%
44			Water Pollution	NW2.3 Prevent surface and groundwater contamination	4	0	-1	4 of 4	
45		BIODIVERSITY	Environmental	NW3.1 Preserve species biodiversity	2	0	2	2 of 2	
46			Environmental	NW3.2 Control invasive species	3	0	0	3 of 3	
47			Environmental	NW3.3 Restore disturbed soils	2	0	0	2 of 2	
48			Environmental	NW3.4 Maintain wetland and surface water functions	5	0	0	5 of 5	
				TOTAL	**32**	**0**	**14**	32 of 32	
49	CLIMATE	EMISSION	Air Pollution	CR1.1 Reduce greenhouse gas emissions	2	0	0	2 of 2	NA 30%
50			Air Pollution	CR1.2 Reduce air pollutant emissions	2	0	0	2 of 2	No 0%
51			Resiliency-Climate Change	CR2.1 Assess climate threat	1	0	0	1 of 1	
52			Resiliency-Climate Change	CR2.2 Avoid traps and vulnerabilities	2	0	0	2 of 2	
53		RESILIENCE	Resiliency-Climate Change	CR2.3 Prepare for long-term adaptability	1	0	0	1 of 1	Yes 70%
54			Resiliency-Climate Change	CR2.4 Prepare for short-term hazards	2	0	0	2 of 2	
55			Resiliency-Climate Change	CR2.5 Manage heat islands effects	0	0	1	0 of 0	
				TOTAL	**10**	**0**	**1**	10 of 10	
				Grand Total	**113**	**0**	**30**		