



Project Study Report (PSR)

To

Request Programming for Capital Support (Project Approval and Environmental Document Phase) for Senior Project 23-24

On Route: I-10 Interstate at E. Ramsey St. and Main St.

APPROVAL RECOMMENDED:

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APPROVAL RECOMMENDED:

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Co-Project Manager

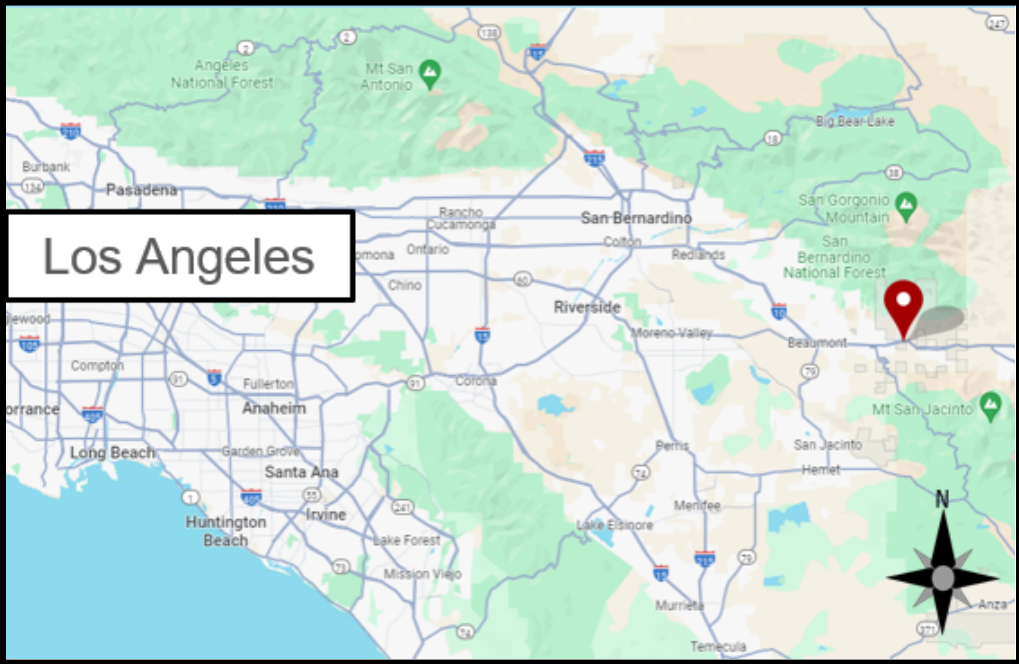
Calvin K. Wong, EIT
Co-Project Manager

APPROVED:

Name, District Director *(or delegated authority)*

Date

Vicinity Map



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

REGISTERED CIVIL ENGINEER

DATE



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1. Executive Summary

The project is an evaluation of a portion of Interstate 10 (I-10) that encompasses a five mile length between Postmile R14.83 and Postmile R19.40 within the City of Banning and the Unincorporated Community of Cabazon with a planned opening year of 2030 and a design year of 2050. The freeway connects a significant number of California cities as well as and is utilized for interstate travel.

The Project Study Report (PSR) is intended to coordinate the needs and purposes of the project as well as form a consensus on an appropriate scope and schedule to be communicated with regional and local agencies as well as gain approval to move into the Project Approval and Environmental Document (PA&ED) phase.

The following sections separate the Project Initiation Document (PID) phase into the main components of Purpose and Need, Traffic Engineering Performance Assessment, Corridor and System Coordination, Alternatives, Environmental Compliance, Funding, Weighted Decision Matrix, Risks, and External Agency Coordination.

The Purpose and Needs details the guidelines that the project is completed through, acting as a set of goals and objectives for each alternative to fulfill and is used to determine the effectiveness of each alternative based on their level of compliance with the purpose and need.

The Traffic Engineering Performance Assessment summarizes the contents of Attachment B - Intersection Safety and Operations Assessment Process (ISOAP) and also consists of an evaluation of the mainline operations with and without the project.

Corridor and Systems Coordination summarizes the factors that were considered in regards to the existing networks of transportation currently referring to documents such as Attachment E - Complete Streets Analysis. In addition to this, the section of External Agency Coordination follows a similar, instead listing specific agencies and their respective processes that are required for the project to proceed.

Alternatives gives a brief explanation on the fundamental characteristics of each alternative proposed for the two sites accompanied by their intrinsic benefits and flaws specific to their interchange type.

Environmental Compliance summarizes the findings from Attachment A- Preliminary Environmental Analysis Report (PEAR) consisting of future studies and reports based on the conditions present at each site.

The Funding section provides a breakdown of the components of Attachment H - Cost Estimate as a total cost in multiple broad categories to form a preliminary estimate of the expected costs of each alternative to determine the efficiency of each option.

The Weighted Decision Matrix serves as the decision making entity to determine the preferred alternative through a series of metrics determined by project personnel that is summarized in the aforementioned section.

The Risks section is Attachment G - Risk Register that serves to measure the opportunity or risks of possible situations and determine plans of action in advance for each. As seen in the Weighted Decision Matrix, Alternative 2 Hook Interchange was the preferred alternative for the

Main Street Interchange and Alternative 3 Tight Diamond Interchange was the preferred alternative for the East Ramsey Street Interchange.

Project Limits	District 8 - Riverside County - I-10 Freeway Begin Postmile R14.83/End Postmile R19.40
Number of Alternatives	Main Street - 3 Alternatives East Ramsey Street - 3 Alternatives
Programmable Alternatives	Main Street - Alt. 2: Hook Ramps East Ramsey Street - Alt. 3: Tight Diamond
Current Capital Outlay Support Estimate	Main Street - \$ 9,878,000 East Ramsey Street - \$ 5,050,000
Current Capital Outlay Construction Estimate	Main Street - \$ 38,614,000 East Ramsey Street - \$ 28,131,000
Current Capital Outlay Right-Of-Way Estimate	Main Street - \$ 9,215,000 East Ramsey Street - \$ 3,438,000
Type of Facility	Main Street - Overpass facility East Ramsey Street - Overpass facility
Number of Structures	Main Street - 1 East Ramsey Street - 1
Anticipated Environmental Determination or Document	Preliminary Environmental Analysis Report (PEAR)
Legal Description	The proposed I-10 Freeway Conversion in the City of Banning and Community of Cabazon
Project Development Category	See PDPM Chapter 8, Section 5

2. Background

Caltrans proposes an improvement project aimed at relieving traffic conditions along Interstate 10 (I-10) within the City of Banning and Community of Cabazon. The I-10 is an interstate highway connecting California in the East-West direction that is a major connector for Riverside County.

Within the project area, I-10 is a eight-lane divided freeway with three 12-foot-wide, mixed flow lanes in each direction, and 16-foot-wide inside and 12-foot-wide outside shoulders. A concrete barrier separates the eastbound and westbound lanes of traffic. The existing right-of-way (ROW) width is 200 to 300 feet with access control on either side, where applicable.

I-10 is included in the National Highway System (NHS), the Rural and Single Interstate Routing System (RSIRS), and the Strategic Highway Corridor Network (STRAHNET). It is also a Surface Transportation Assistance Act (STAA) Route for use by oversized trucks. The segment within the project limits is functionally classified as an Urbanized Freeway from Postmile R14.83 to Postmile R16.40, beyond to Postmile R19.40 as a Rural Freeway. I-10 is a major transportation route that connects the City of Banning and the Community of Cabazon to Los Angeles and San Bernardino counties to the west, and the State of Arizona to the east.

The 2017 I-10 Transportation Concept Report (TCR) shows that eight lanes (which includes both directions) are required on I-10 through the project limits to attain a Level of Service (LOS) "D" rating. The project is consistent with the identified goals of the TCR and is recognized as one of the strategies to achieve the corridor concept.

I-10 and East Ramsey Street Interchange consist of only two access ramps: the eastbound on- and westbound off-ramp. The ramps terminate at a tee intersection, where the crossroad is a driveway to a Caltrans maintenance facility. The east and west approaches (the major road) are free flowing, while the driveway (the minor road) is stop controlled. An eastbound left turn bay exists for the patrons of the maintenance facility.

I-10 and Main Street Interchange consist of all four access ramps, where the eastbound and westbound ramps terminate at a four-way intersection. The eastbound ramps are at a two-way stop-controlled intersection, while the westbound ramps are controlled with an all-way-stop. The eastbound ramp intersection connects with Main Street as the crossroad, as well as a connection to the alternative I-10 access road (Railroad Avenue). The Main Street overcrossing is generally an undivided two-lane overcrossing that features multiple horizontal curves.

Existing traffic counts and turning movements are collected using Streetlight Data. Streetlight obtains its data with cell phone, connected vehicles, and other sources which are processed under their machine learning algorithm. The traffic counts were averaged over the period of May 1, 2023 to May 31, 2023. At the time of this report, the Performance Measurement System (PeMS), Caltrans, shows that all vehicle detector stations within the project area are not operational. In lieu of recent traffic counts, data was collected using the same methodology with Streetlight Data. Counts were average over the same month of May 2023.

3. Purpose and Need

The purpose of the proposed Project is to:

- Provide safety and operational improvements along Interstate-10 (I-10) and its access points to accommodate the existing and forecasted travel demand, associated with local and regional growth, for the 2050 design year;
- Improve the existing interchange geometry at the East Ramsey Street and Main Street Interchange
- Accommodate multimodal travel that integrates, but is not limited to, with the City of Banning's General Plan, Cabazon Master Plan, and regional plans.

The proposed Project aims to address the following needs:

- The collision history records display a trend that indicates geometric safety hazards, and the forecasted traffic volumes, in conjunction with the current capacity of the existing interchanges, are expected to result in operational safety hazards by the year 2050;
- The sub-standard ramp alignments, ramp terminals, and the absence of the Westbound On- and Eastbound Off-Ramps at the East Ramsey Street interchange and;
- Gaps in the pedestrian and bicycle infrastructure impede the connection between the existing and planned communities at the East Ramsey Street and Main Street interchanges.

4. Traffic Engineering Performance Assessment

Refer to relevant findings, recommendations, and estimates provided in the Traffic Engineering Performance Assessment.

Intersection Safety and Operations Assessment Process (ISOAP)

The Intersection Safety and Operations Assessment Process (ISOAP) documents the framework of analyzing at-grade traffic intersections while incorporating the Safe System approach to identify potential improvements. The process is a successor to the Intersection Control Evaluation policy and procedure. This report is outlined to follow the ISOAP and is accompanied by the methodologies used to conduct its procedures.

Facility Operations Analysis

The Freeway methodologies published in Chapters 10 through 14 of the Highway Capacity Manual 6th Edition along with the Highway Capacity Software 2023 package were used to evaluate operation on I-10. The metric used to determine the LOS of a freeway is density, measured as passenger cars per mile per lane (pc/mi/ln) with consideration included for the free-flow speed of the facility. For LOS D or better operations, the density thresholds established are identical for all free-flow speeds. However, for LOS E and LOS F, the density

thresholds vary based on the facility’s free-flow speed. A summary of density breakpoints is shown in Table 1

Table 1– Freeway Level of Service Criteria		
LOS	Free-Flow Speed (mph)	Density (pc/mi/ln)
A	All	>0-11
B	All	>11-18
C	All	>18-26
D	All	>26-35
E	60	>35-40
	55	>35-41
	50	>35-43
	45	>35-45
F	60	>40
	55	>41
	50	>43
	45	>45

Reference: *Highway Capacity Manual*, Transportation Research Board, 2016

The HCS7 software package was used to determine the merging, diverging, weaving, and mainline Levels of Service for I-80. Merging, diverging, and weaving analyses were completed for the on-ramps and off-ramps that would be subject to project traffic, including the ramps at San Pablo Dam Road. Mainline analysis was assessed for the I-80 mainline to the north and south of the San Pablo Dam Road interchange. Under existing conditions, all the study freeway facilities are operating acceptably at LOS D or better. A summary of the freeway operational calculations is shown in Table 2, and copies of the analysis calculations are provided in Appendix C.

Table 2 – Freeway Operations						
Facility Direction Mainline Segment Ramp Segment	Existing		Build		Design	
	Density	LOS	Density	LOS	Density	LOS
I-10 Eastbound						
Before East Ramsey Street Off-Ramp	15.3 (15.7)	B (B)	21.1 (22.1)	C (C)	40.2 (42.2)	F (F)
<i>East Ramsey Street Off-Ramp</i>			23.5 (23.4)	C (C)	34.8 (34.6)	D (D)
<i>East Ramsey Street On-Ramp</i>	14.8 (15.3)	B (B)	18.7 (20.4)	C (C)	27.4 (29.7)	D (D)
After East Ramsey Street On-Ramp	16.8 (17.3)	B (B)	21.6 (23.5)	C (C)	33.2 (36.3)	D (E)
Before Main Street Off-Ramp	11.8 (13.4)	B (B)	15.5 (18.8)	B (C)	24.8 (25.6)	C (C)
<i>Main Street Off-Ramp</i>	13.9 (15.3)	B (B)				
<i>Main Street Off-Ramp with Project</i>			18.0 (20.9)	B (C)	23.4 (25.8)	C (C)
<i>Main Street On-Ramp</i>	11.5 (12.9)	B (B)	14.7 (17.5)	B (B)	20.4 (29.2)	C (D)
After Main Street On-Ramp	11.8 (13.4)	B (B)	15.4 (18.9)	B (C)	25.2 (28.2)	C (D)
I-10 Westbound						
Before Main Street Off-Ramp	11.8 (16.4)	B (B)	15.9 (23.6)	B (C)	26.6 (54.6)	D (F)

Table 2 – Freeway Operations						
Facility Direction Mainline Segment Ramp Segment	Existing		Build		Design	
	Density	LOS	Density	LOS	Density	LOS
<i>Main Street Off-Ramp</i>	14.6 (19.7)	B (C)				
<i>Main Street Off-Ramp with Project</i>			19.8 (27.7)	C (D)	27.1 (25.9)	D (C)
<i>Main Street On-Ramp</i>	11.2 (15.6)	B (B)	14.9 (20.3)	B (C)	20.8 (28.4)	C (D)
<i>After Main Street On-Ramp</i>	11.5 (15.6)	B (B)	15.4 (22.3)	B (C)	24.0 (36.7)	C (E)
<i>Before East Ramsey Street Off-Ramp</i>	12.8 (19.9)	B (C)	17.2 (26.3)	B (D)	25.4 (36.6)	C (E)
<i>East Ramsey Street Off-Ramp</i>	14.4 (21.0)	B (C)	18.9 (27.2)	B (D)	27.1 (35.3)	D (E)
<i>East Ramsey Street On-Ramp</i>			14.2 (21.2)	B (C)	20.4 (28.4)	C (D)
<i>After East Ramsey Street On-Ramp</i>	11.1 (16.5)	B (B)	15.1 (23.8)	B (C)	23.3 (36.7)	C (E)

Notes: Values are presented as AM (PM); Density is denoted as passenger cars per mile per lane (pcpmpl); Bold indicates deficient operations

5. Deficiencies

There is a deficiency in the access being provided at East Ramsey Street with the existing interchange lacking eastbound off-ramp access as well as westbound on-ramp access for complete access to the I-10.

Both East Ramsey Street and Main Street also both have collision histories that should indicate a future deficiency in safety improvements as well as deficiencies in mainline operations in existing conditions by the design year of 2050.

6. Corridor and System Coordination

The existing corridor mostly comprises unsignalized intersections. Each of the alternatives at all interchanges includes actuated coordinated signal timing.

Information from the City of Banning General Plan should be incorporated to include relevant information regarding surrounding land use and plans for future development to align the objectives of the project with the planned developments in the area.

Complete Street Analysis was performed to determine the viability of multimodal transportation options within the surrounding area.

7. Alternatives

I-10 and East Ramsey Street Interchange

Alternative 1 is a Trumpet (Type L-11) interchange, commonly used where the crossroad terminates at the freeway – which would be the case in this Project – however, future expansion with the interchange to allow a connection south of the I-10 would not be feasible.

Alternative 2 is a Hybrid Tight and Spread Diamond (Type L-1 and Type L-2) interchange, the westbound ramps would feature ramps with multiple horizontal curves to achieve greater spacing between the eastbound ramps. Providing additional space between the westbound would allow future expansion with loop ramps if demand warrants the extra capacity.

Alternative 3 is a Tight Diamond (Type L-1) interchange, the defining attribute is the closely spaced ramps, and is suitable where physical or geometric restrictions do not permit a spread diamond.

I-10 and Main Street Interchange

Alternative 1 is a Single Point Interchange (Type L-13), where the westbound and eastbound ramps are terminated at a single at-grade intersection. This interchange allows for left-turning movements to occur simultaneously, and should be used where left-turning traffic are balanced

to and from eastbound and westbound. The interchange is not feasible to allow future expansion if additional capacity is warranted.

Alternative 2 is a Hook (Type L-6) interchange, which is typically placed where the freeway alignment is parallel with the local street system – which is the case in its existing condition. The purpose of this alternative is to preserve the Main Street alignment, while accommodating future roadway expansion North of the freeway.

Alternative 3 is a Tight Diamond (Type L-1) interchange, its placement was chosen due to the adjacent railway, south of the interchange. Future expansion of the interchange would not be feasible, however, if future demand warrants, a Diverging Diamond could be constructed with relative ease compared to the other alternatives.

8. Right-of-Way

Category	Ramsey Tight Diamond	Ramsey Spread Diamond	Ramsey Trumpet	Main SPUI	Main Hook	Main Tight Diamond
Support Cost	\$ 5,050,000	\$ 8,533,000	\$ 10,078,000	\$ 8,515,000	\$ 9,878,000	\$ 6,278,000

9. Stakeholder Involvement

Meetings were held with both the City of Banning and the Morongo Band of Mission Indians to discuss the existing conditions of both locations

Communication should be maintained with these parties to reduce future conflicts over interests and should also be expanded to include local businesses within the vicinity of both projects. Community outreach meetings should be held in the City of Banning and the Community of Cabazon for the general public to voice their concerns and opinions on this project.

10. Environmental Compliance

The Preliminary Environmental Analysis Report (PEAR) provides an initial environmental evaluation of the proposed project and its feasible alternatives. The proposed project qualifies as an Initial Study in accordance with CEQA and an Environmental Assessment in accordance with NEPA. Thus, an Initial Study/ Environmental Assessment (IS/EA) Determination Form is needed for the PA&ED phase of this project.

The project does not include many visual resources, and the projected impacts on existing visual aesthetics are low. However, environmental commitments to revegetation of disturbed areas due to construction may be necessary.

The project impacts the surrounding community during construction and completion, which requires further investigation into the CIA. Additionally, the proposed project area was previously disturbed, and a PIR is not necessary.

Some of the project area is on and disturbed Tribal/Reservation Morongo Land; thus cultural resources should be discussed and coordinated through consultation in accordance with Section 106/ PRC 5024 and AB 52. Verbal approval has been provided to the proposed project locations stated within the PEAR and assumes that no historical land is being disturbed.

For the project, both zones are within the San Gorgonio River watershed, which increases impervious surface area. A water quality report should be made to analyze the full potential impact of the project. Additionally, a National Pollutant Discharge Elimination System (NPDES) in preparation for a Stormwater Pollution Prevention Plan (SWPPP). The floodplain impact would be evaluated in a report that may require a Letter of Map Report (LOMR) or Conditional Letter of Map Report (CLOMR) due to flow and impervious area modifications.

One of the project zones is adjacent to a local gas station. If the gas station needs to be removed, then an Initial Site assessment (ISA) is needed. (only applicable to retired stations)

The project reconfigures the interchange and likely improves the overall traffic flow on the site. Because the area is within a CO nonattainment maintenance area, a Hot Spot Analysis should be conducted to assess the impacts the alternatives may pose.

For the project, a Noise Study Report should be prepared in accordance with the latest Caltrans Technical Noise Supplement and Traffic Noise Analysis Protocol to determine if the project disturbs the communities of Banning and Cabazon. If traffic noise impacts are identified, a Noise Abatement Decision Report is required.

The proposed project sites on conservation area plans and habitats of other protected species are noted to be within the area. Collaboration with the plans should be taken. Additionally, NES should be prepared to identify and confirm that all of the habitats exist and are valid and mitigated properly. The report would provide further detail into determining the appropriate permits like Section 2081 for state protected animals and Section 7 PBO for desert tortoises.

For Waters of the State, Waters of the United States, and wetlands, Jurisdictional Delineation (JD) may be needed to differentiate the wetlands being affected by the project site. Additionally, water permits from CWA 404 from USACE and CWA 401 from RWQCB are necessary for the project.

11. Funding

Category		Ramsey Tight Diamond	Ramsey Spread Diamond	Ramsey Trumpet	Main SPUI	Main Hook	Main Tight Diamond
Section	Item						
1	Earthwork	\$ 1,760,000	\$ 2,357,000	\$ 5,524,000	\$ 3,241,000	\$ 2,156,000	\$ 1,959,000
2	Pavement Structural Section	\$ 6,479,000	\$ 12,268,000	\$ 13,734,000	\$ 7,004,000	\$ 6,641,000	\$ 7,133,000
3	Drainage	\$ 824,000	\$ 1,463,000	\$ 1,926,000	\$ 1,025,000	\$ 880,000	\$ 910,000
4	Specialty Items	\$ 165,000	\$ 293,000	\$ 386,000	\$ 205,000	\$ 176,000	\$ 182,000
5	Environmental	\$ 412,000	\$ 732,000	\$ 963,000	\$ 513,000	\$ 440,000	\$ 455,000
6	Traffic Items	\$ 412,000	\$ 732,000	\$ 963,000	\$ 513,000	\$ 440,000	\$ 455,000
7	Detours	\$ 412,000	\$ 732,000	\$ 963,000	\$ 513,000	\$ 440,000	\$ 455,000
8	Minor Items	\$ 942,000	\$ 1,672,000	\$ 2,202,000	\$ 1,171,000	\$ 792,000	\$ 819,000
9	Roadway Mobilization	\$ 1,141,000	\$ 2,025,000	\$ 2,666,000	\$ 1,419,000	\$ 880,000	\$ 910,000
10	Supplemental Work	\$ 457,000	\$ 810,000	\$ 1,067,000	\$ 568,000	\$ 352,000	\$ 364,000
11	State Furnished	\$ 229,000	\$ 405,000	\$ 534,000	\$ 284,000	\$ 176,000	\$ 182,000
12	Time-Related Overhead	\$ 685,000	\$ 1,215,000	\$ 1,600,000	\$ 851,000	\$ 528,000	\$ 546,000
13	Total Roadway Contingency	\$ 3,479,000	\$ 6,175,000	\$ 9,757,000	\$ 4,325,000	\$ 7,301,000	\$ 2,273,000
14	Structure Items	\$ 10,734,000	\$ 16,930,000	\$ 16,957,000	\$ 21,230,000	\$ 17,412,000	\$ 21,968,000
15	Right of Way	\$ 3,438,000	\$ 5,530,000	\$ 3,749,000	\$ 10,363,000	\$ 9,215,000	\$ 12,501,000
16	Support Cost	\$ 5,050,000	\$ 8,533,000	\$ 10,078,000	\$ 8,515,000	\$ 9,878,000	\$ 6,278,000
Total Project Cost		\$ 36,619,000	\$ 61,872,000	\$ 73,069,000	\$ 61,740,000	\$ 57,707,000	\$ 57,390,000

12. Weighted Decision Matrix

Methodology

Each alternative is evaluated based on seven weighted criteria listed below, where each criterion descending by weight value.

B/C (7) – FHWA B/C ratio is a new measure on evaluating proposed designs – like Caltrans methodology. The main difference is when evaluating the benefits; where benefits are monetized by primarily crash reduction which would translate to a reduction in travel time and emissions. The FHWA is implementing this new methodology to incorporate the Safe Systems Approach, where evaluating crash severity and frequency is the primary goal of a Project.

ISOAP Results (6) – Assessment of each proposed design's safety and operational performance. This includes (but not limited to) the evaluation of crash frequency, operational safety hazards, and review of the existing site to mitigate any potential geometric hazards.

Environmental Impact (5) – Evaluation of each proposed design based on the PEAR process.

Right of Way Impact (3) – Evaluation of the proposed design's impact on the land, which incorporates (but not limited to) the land's owner (City, Agency, Tribal Land), the geological impacts, and easements acquisitions.

Complete Streets (4) – An evaluation to determine the feasibility of recommended complete street elements. Penalties are given based on substituting the recommended element with a less preferable alternative to that element.

Constructability (2) – A high-level analysis of each proposed design's ease of staging and may include an assessment on delay due to rerouting or closure to the roadway.

User Expectations (1) – A high-level analysis of the driver's behavior due to each design of the alternative; penalty is given (but not limited to) the driver's perceived knowledge of the operations of the facility, the amount of traffic devices to ensure the driver's compliance to the facility, and the roadway "prima facie" (at first glance) to its road users.

Decision Matrices

Each criterion is weighted on a scale from 1 to 7, where 7 represents the greatest weight to a rating, and 1 represents the lowest weight. Each alternative is given a rating as well as from 1 to 7 and then multiplied by the weight. The purpose of this rating system is to prioritize the alternative based on the most influential criterion. The weighted ratings are totaled from each criterion and the greatest total weighted rating for an alternative would represent the most feasible design alternative for the Project.

Main Street Interchange							
Criterion	Weight	Alt #1 (SPUI)		Alt #2 (Hooks)		Alt #3 (Tight)	
		Rating	Weighted	Rating	Weighted	Rating	Weighted
Benefit/Cost Analysis	7	7	49	9	63	4	28
Traffic Evaluation	6	10	60	6	36	3	18
Environmental Impact	5	7	35	7	35	4	20
Complete Streets	4	7	28	8	32	7	28
Right of Way Impact	3	6	18	8	24	4	12
Constructability	2	5	10	7	14	8	16
User Expectation	1	4	4	2	2	8	8
Total:		-	204	-	206	-	130

East Ramsey Street Interchange							
Criterion	Weight	Alt #1 (Trumpet)		Alt #2 (Diamond)		Alt #3 (Tight)	
		Rating	Weighted	Rating	Weighted	Rating	Weighted
Benefit/Cost Analysis	7	4	28	9	63	6	42
Traffic Evaluation	6	3	18	9	54	6	36
Environmental Impact	5	4	20	4	20	8	40
Complete Streets	4	5	20	5	20	8	32
Right of Way Impact	3	2	6	5	15	9	27
Constructability	2	4	8	4	8	9	18
User Expectation	1	8	8	10	10	10	10
Total:		-	108	-	190	-	205

13. Risks

Level 2 - Risk Register						Project Name:	I-10 Interchange Improvements (East Ramsey Street and Main Street)					PM's:	Stacy Soewono Calvin Wong
Risk Identification							Risk Assessment					Risk Response	
Status	ID	Location	Type	Category	Title	Statement	Probability	Cost Impact	Cost Score	Time Impact	Time Score	Strategy	Response Actions
Active	1	Main	T	E	Section 106	Under the circumstances that historical properties are discovered on site of any construction project, additional consulting is required.	2	1	2	4	8	Accept	Provide proper consulting when historical artifacts are found. Ensure that the local tribe is contacted to verify if the objects belong to them.
Active	2	Both	T	E	Utility Relocation	Discovery of utilities within the construction site requires proper accommodations to maintain utility	4	4	16	2	8	Mitigate	If any utilities are found, it should be brought to the attention of the utility company and properly addressed as to what is done with their lines.

						connections and operations for surrounding communities.							
Active	3	Both	T	E	Lead Based Paint	Usage or any handling of lead based paint (LBP) requires certification, specifically for intentional removal.	2	2	4	2	4	Accept	If it is found that LBP is found on or near the project site there should be proper storage and disposal of found materials.
Active	4	Main	T	E	Hazardous Material Contamination	Under the circumstances that hazardous materials are discovered as result of the PSI, additional time and money is required for review and testing,	2	4	8	8	16	Mitigate	Hazardous materials should be properly stored and taken care of during the construction phase to ensure mitigation of this.
Active	5	Both	T	E	Water Contamination	Cut and Fill operations may lead to pollutants from Construction	3	4	12	8	24	Mitigate	Proper fencing and storage of Cut/Fill operations should be done to mitigate this problem

						entering water sources in the surrounding area requiring a NPDES permit							
Active	6	Both	T	E	Paleontology Discoveries	There is potential for paleontological resources is discovered at project locations that requires additional project approvals, impacting both time and costs	1	4	4	16	16	Accept	If any paleontological resources are found, the proper authorities should be notified and the construction should be paused to allow pickup of said discoveries
Active	7	Both	T	E	Nesting Birds	If nesting birds are found in the project work area, stop work order, work windows, and/or biological monitoring would be required, which could result in construction	3	2	6	8	24	Accept	If any nesting birds are found, the project shall be stopped until they leave the area.

						schedule delays and capital and support cost increases.							
Active	8	Both	T	E	Jurisdiction Errors	If the Jurisdictional Delineation (JD) Survey identifies more jurisdictional areas then assumed in this PEAR, then additional mitigation may be required.	2	8	16	4	8	Accept	Jurisdictional Delineation should be double checked during the surveying of project sites.
Active	9	Both	O	T	Forecasting Data Inaccuracies	If newfound information in future design phases suggests alternative forecasting numbers, the project may be able to reexamine alternatives and further seek	4	2	8	4	16	Mitigate	Verify in future phases that forecasting is an accurate depiction of future conditions and adjust metrics as necessary for alternatives.

						more optimal solutions							
Active	10	Main	O	T	I-10 Alternative	The I-10 alternative has been identified as a necessary component when considering the Main interchange and thus any opinions regarding the treatment of the I-10 alternative should be considered, thus impacting the project as a whole	3	2	6	4	12	Mitigate	Address concerns of any stakeholders that present opinions concerning the treatment of the I-10 alternative utilizing engineering judgment to rationalize the acceptance or denial of suggestions
Active	11	Both	O	T	Morongo Casino	Unknown projects dealing with the expansion of Morongo Casino and Resort could result in substantial changes to	3	2	6	2	6	Accept	Any additional information is taken into consideration and applied to each alternative to evaluate the potential impacts.

						expected travel behaviors in the surrounding areas							
Active	12	Both	T	R/W	Condemnation	Under the circumstances that R/W can not be acquired, the condemnation process may need to be used, causing significant delays and costs	1	8	8	16	16	Mitigate	If condemnation is required, evaluate the possibility of adjustments to weigh against the cost and time impacts of going through the process.
Active	13	Both	O	C	Public Opinion	Public interest in the project may result in community pushes for certain additions or provision to the project be made.	4	4	16	8	32	Mitigate	Suggestions from the community are important consideration to make, but severe impacts to project costs and schedule that exceed an acceptable value should be rationalized to the public

Active	14	Both	T	D	Survey File	More accurate survey data could be uncovered that requires modifications to the design to accurately reflect the existing conditions of the sites	5	4	20	4	20	Mitigate	Prioritize the acquisition of accurate survey information to rectify alternatives before further design work commences.
Active	15	Both	T	D	Geotechnical	A geotechnical investigation of the site can reveal new information concerning the feasibility of structures that may alter the design of facilities.	3	2	6	4	12	Mitigate	Geotechnical investigations should be completed early in future phases to ensure that design work is founded on accurate information.
Active	16	Both	T	D	Quantities	Quantities could be incorrectly estimated which impacts the cost estimations for each alternative	4	8	32	1	4	Mitigate	The inaccuracy of the quantities estimation should be accounted for in the budget through contingency.

Active	17	Both	T	E	Tortoise	If desert tortoises are found, there should be a relocation of the habitat, or if it is found that they are nesting, a stop work order should be issued and all work stopped until they leave.	2	2	4	2	4	Mitigate	There should be preliminary surveys conducted within the project areas to find if these are in our project area.
Active	18	Both	T	E	Joshua Trees	If any Joshua Trees are found, the relocation of these plants should be done prior to any construction.	2	2	4	2	4	Mitigate	There should be preliminary surveys conducted within the project areas to find if these are in our project area.

14. External Agency Coordination

Federal Highway Administration (FHWA)

This project modifies access to the National Highway system which requires future coordination and conditioning by the Federal Highway Administration requiring Determination of Engineering and Operational Acceptability and Final Approval.

The project requires the following coordination:

US Army Corps of Engineers

Department of the Army Permit for:

Clean Water Act Section 404

Rivers and Harbors Act of 1899 Section 9

Rivers and Harbors Act of 1899 Section 10

General Permits (Regional Permit, Nationwide Permit or Programmatic Permit)

Standard Permits (Individual Permit or Letter of Permission)

Section 9 Permit

United States Coast Guard

Rivers and Harbors Act of 1899 Section 9

Bridge Permit

California Department of Fish and Wildlife

California Fish and Game Code Section 1602

Lake or Streambed Alteration Agreement

California Coastal Commission and/or Local Coastal Program

California Public Resources Code Division 20 (California Coastal Act)

Coastal Development Permit

California State Lands Commission

California Public Resources Code Division 6

Permit

Central Valley Flood Protection Board

California Water Code Division 5, Part 4

Encroachment Permit

Regional Water Quality Control Board

Clean Water Act Section 401

Water Quality Certification

Local Agency

Cooperative Agreements with the City of Banning and the Community of Cabazon for the approval of approved alternatives.

Local Agency

Agreements with **Morongo Band of Missions Indians** for approval of geometrics of approved alternatives.

15. Project Reviews

Field Review _____ Date _____
District Maintenance _____ Date _____
District Traffic Safety Engineer _____ Date _____
Headquarters Project Delivery Coordinator _____ Date _____
Project Manager _____ Date _____
FHWA _____ Date _____
District Safety Review _____ Date _____
Constructability Review _____ Date _____
Other _____ Date _____

16. Project Personnel

Project Managers

Calvin Wong, EIT, ENV SP

Stacy Soewono, ENV SP

Environmental Team

Sean Lin, EIT

Ethan Morgan

Samuel Espinoza

Design Team 1

Andre Mai, EIT, ENV SP

Katherine Wang

Quynh Huynh

Matthew Nguyen, EIT

Justin Thomas, EIT

Traffic Team

Jasper Hendra, EIT, ENV SP

Charlene Nguyen, EIT

Maria Khalil

Jonathan Hu

Design Team 2

Zi Hao Liang, EIT, ENV SP

Paul Nguyen

Eric Johnson

Danny Chhen, EIT

Santiago Martinez

17. Attachments

- Attachment A- Preliminary Environmental Analysis Report (PEAR)
- Attachment B - Intersection Safety and Operations Assessment Process (ISOAP)
- Attachment C - Geometric Approval Documents (GAD)
- Attachment D - Advanced Planning Study (APS)
- Attachment E - Complete Streets Analysis
- Attachment F - Construction Staging Plan
- Attachment G - Risk Register
- Attachment H - Cost Estimate
- Attachment I - Benefit/Cost Analysis
- Attachment J - Weighted Decision Matrix