



2023 - 2024

College of Engineering

# **I-10 FREEWAY SENIOR PROJECT**

California State Polytechnic University, Pomona

---

## **Complete Streets**



## Study Participants

---

**Stacy Soewono, ENV SP**  
Co-Project Manager

---

**Calvin K. Wong, EIT, ENV SP**  
Co-Project Manager

---

**Jasper C. Hendra, EIT, ENV SP**  
Lead ISOAP Engineer

---

**Charlene L. Nguyen, EIT**  
Travel Forecast Planner

---

**Maria Khalil**  
Traffic Operations Engineer

---

**Jonathan Hu**  
Traffic Operations Engineer



Publish Date: April 24, 2024



## 1. Introduction

On February 11, 2021, Caltrans Deputy Directors requires all projects to include the Complete Streets Decision Document (CSDD) at the Project Initiation Document (PID) phase. The CSDD aims to provide guidance for documenting decisions on the selection of complete street facilities.

## 2. Evaluation

Based on evaluation discussed in the Intersection Operations and Safety Assessment Process (ISOAP), several complete streets elements are preferred in the design of the Project.

Deficiencies in are listed based on the relevant interchange denoted with “E” for the East Ramsey Street Interchange, and “M” for the Main Street Interchange, followed by a period (.), and the enumerated count (e.g. E.1 – i.e. the first deficiency instance found at the East Ramsey Street Interchange). Further discussion on the causes of the listed deficiencies is found in the ISOAP.

### East Ramsey Street Interchange Deficiencies

**E.1** – Lack of pedestrian and bicycle facilities to allow future crossings over the I-10 freeway. Neither pedestrian facility to accommodate refuged drivers at the interchange overcrossing or ramps.

**E.2** – Lack of pedestrian and bicycle facilities along the overcrossing for a potential connectivity south of the I-10 freeway. However, the interchange may be feasible to add such facilities.

**E.3** – Lack of pedestrian and bicycle facilities along the overcrossing for potential connectivity south of the I-10 freeway. However, the interchange may be feasible to add such facilities.

### Main Street Interchange Deficiencies

**M.1** – Pedestrian and bicycle facilities exist along the northbound side of the overcrossing. No other deficiencies were noted.

**M.2** – Pedestrian and bicycle facilities exist along the southbound side of the overcrossing. However, close attention to the eastbound off-ramp turning traffic may conflict with crossing traffic.

**M.3** – Pedestrian and bicycle facilities exist along the northbound side of the overcrossing. No other deficiencies were noted.

## 3. Recommendations

The deficiencies are provided with a recommendation based on several factors such as: a geometric safety hazard, its absence and ability to accommodate said user, and stakeholders



demands. Table 1 identifies a preferred complete street element that would mitigate the deficiency as previously mentioned. Each element is accompanied by a cost estimate.

<b>Table 1 – Preferred Complete Street Element Summary</b>			
<b>Deficiency No.</b>	<b>Facility Type</b>	<b>Included (Y/N/NF)</b>	<b>Estimated Total Cost</b>
R1.1	TRUMPET - ALT 1		
	Crosswalks (201.999) - CSC	Y	\$\$
	LED Lighting (201.999) - CSC	Y	\$
	Pedestrian access / sidewalks* (201.999) - CSC	Y	\$\$
<b>R2.1/R2.2</b>	<b>SPREAD DIAMOND/HYBRID - ALT 2</b>		
	Pave Shoulders (201.010, .015)	Y	\$
	Shoulders - New & Widening (201.310, .010, .015)	Y	\$\$
	LED Lighting (201.999) - CSC	Y	\$\$
<b>R3.1/R3.2</b>	<b>TIGHT DIAMOND - ALT 3</b>		
	Pave Shoulders (201.010, .015)	Y	\$
	New/Modified Crosswalks (201.010, .015)	Y	\$\$
	Shoulders - New & Widening (201.310, .010, .015)	Y	\$\$
	LED Lighting (201.999) - CSC	Y	\$\$
	Yield Lines (201.999)	Y	\$
<b>M1.1</b>	<b>SPUI - ALT 1</b>		
	Pave Shoulders (201.010, .015)	Y	\$
	Pedestrian Crossings (201.010, .015)	Y	\$\$
	Widen Shoulders (201.010, .015)	Y	\$\$
	New/Modified Crosswalks (201.010, .015)	Y	\$
	Shoulders - New & Widening (201.310, .010, .015)	Y	\$
	Bridge Access - bike, Ped, ADA (201.999) - CSC	Y	\$\$\$
	Class I Bike Paths (201.999) - CSC	NF	\$
	Class IV Separated Bikeway (201.999) - CSC	Y	\$

**I-10 Interchange Improvement Project (East Ramsey Street and Main Street)**



	Bike Lane Gap Closure (201.999) - CSC	NF	\$
	Conflict zone green paint (201.999) - CSC	NF	\$
	Enhanced Crosswalk Visibility (201.999) - CSC	Y	\$\$\$
	Crosswalks (201.999) - CSC	Y	\$\$
	LED Lighting (201.999) - CSC	Y	\$
	Pedestrian access / sidewalks* (201.999) - CSC	Y	\$
	Bicycle Detection Loops (201.999)	NF	\$
	Bicycle Signals (201.999)	NF	\$\$
	Leading Pedestrian Interval (201.999)	Y	\$
	Yield Lines (201.999)	Y	\$
	Bicycle and Pedestrian Signage (201.999)	Y	\$
	Rectangular Rapid Flashing Beacon (201.999)	Y	\$\$
	Bicycle signal priority (201.999)	NF	\$\$
	Bike/Pedestrian Path Gap Closure (201.999)	Y	\$

M2.1/M2.2	HOOKS - ALT 2		
	Pedestrian Crossings (201.010, .015)	Y	\$
	Restripe Bikeways (201.310)	Y	\$
	New/Modified Crosswalks (201.010, .015)	Y	\$
	Bike Parking (201.999) - CSC	Y	\$\$
	Bridge Access - bike, Ped, ADA (201.999) - CSC	Y	\$\$\$\$
	Class I Bike Paths (201.999) - CSC	Y	\$\$
	Enhanced Crosswalk Visibility (201.999) - CSC	Y	\$\$
	Crosswalks (201.999) - CSC	Y	\$\$
	LED Lighting (201.999) - CSC	Y	\$
	Pedestrian access / sidewalks* (201.999) - CSC	Y	\$\$\$
	Transit Stop Improvements (201.999) - CSC	Y	\$\$
	New Transit Stops (201.999) - CSC	Y	\$\$
	Bicycle Detection Loops (201.999)	Y	\$\$\$
	Bicycle-tolerable drainage grates (201.999)	Y	\$
	Bicycle Signals (201.999)	Y	\$
	Leading Pedestrian Interval (201.999)	Y	\$

**I-10 Interchange Improvement Project (East Ramsey Street and Main Street)**



	Yield Lines (201.999)	Y	\$
	Bicycle and Pedestrian Signage (201.999)	Y	\$
	Rectangular Rapid Flashing Beacon (201.999)	Y	\$\$
	Transit Traveler Information (201.999)	Y	\$
	Bicycle signal priority (201.999)	Y	\$

M3.1/M3.2	TIGHT DIAMOND - ALT 3		
	Pave Shoulders (201.010, .015)	Y	\$
	Pedestrian Crossings (201.010, .015)	Y	\$\$
	New/Modified Crosswalks (201.010, .015)	Y	\$
	Shoulders - New & Widening (201.310, .010, .015)	Y	\$
	Bike Box (201.999) - CSC	Y	\$\$\$
	Bridge Access - bike, Ped, ADA (201.999) - CSC	Y	\$\$\$
	Class II Bike Lane (201.999) - CSC	Y	\$
	Pedestrian Crossings (201.010, .015)	Y	\$
	Conflict zone green paint (201.999) - CSC	Y	\$
	Enhanced Crosswalk Visibility (201.999) - CSC	Y	\$\$\$
	Crosswalks (201.999) - CSC	Y	\$\$
	LED Lighting (201.999) - CSC	Y	\$
	Install Shade for Pedestrian access (201.999) - CSC	Y	\$\$
	Pedestrian access / sidewalks* (201.999) - CSC	Y	\$
	Bicycle Detection Loops (201.999)	Y	\$
	Bicycle-tolerable rumble strips (201.999)	Y	\$
	Bicycle-tolerable drainage grates (201.999)	Y	\$\$
	Bicycle Signals (201.999)	Y	\$\$
	Two-Stage Turn Queue Boxes (201.999)	Y	\$
	Bicycle and Pedestrian Signage (201.999)	Y	\$
	Curb radius reduction (eliminate free right turn) (201.999)	Y	\$\$\$\$
	Bicycle signal priority (201.999)	Y	\$\$

Note: **Bold** text indicates that the preferred element was not feasible to implement in the design of the Project.

### I-10 Interchange Improvement Project (East Ramsey Street and Main Street)