



# *Corridor Crossings*

STRATEGY



*Update on Corridor Crossing Strategy:  
Program Methodology*

03.26.2025



# Meeting Goals and Outcomes



**Brief Overview of  
Grade Crossing  
Program**



**Discussion on  
Crossing Data and  
Assessment**



**Discussion on  
Crossing  
Prioritization**





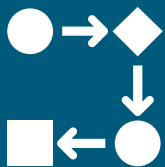
# What is the CCS?

As an outcome of the **Business Plan**, the Corridor Crossings Strategy is an effort to **define a systematic corridor-wide approach** to crossings.

The strategy aims to **align stakeholder ambitions into balance with an implementable program**, addressing:

- Funding
- Organization
- Program Delivery

*Note: Active grade separation projects continue in parallel as the program is finalized and implemented*



# Grade Crossing Program

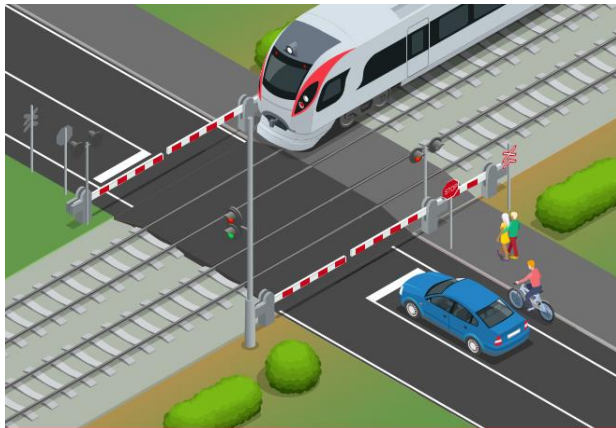
With the nationwide increase in project costs coupled with limited and competitive funding, Caltrain is being deliberate and thoughtful on organizing resources to:



- Identify and prioritize at-grade crossing safety enhancement projects
- Prioritize and facilitate delivery of crossing elimination projects
- Deliver achievable safety enhancement and elimination projects

# Grade Crossing Safety Enhancement Project Types

At-grade crossing improvements implemented at existing elevation. May include signage, striping, solar lane markers, delineators, lighting, and technology.



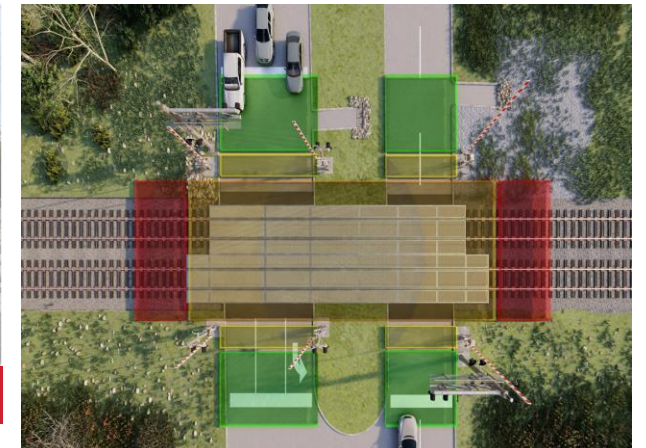
At Grade Crossing w/Safety Improvements



Solar Lane Markers



Warning Devices

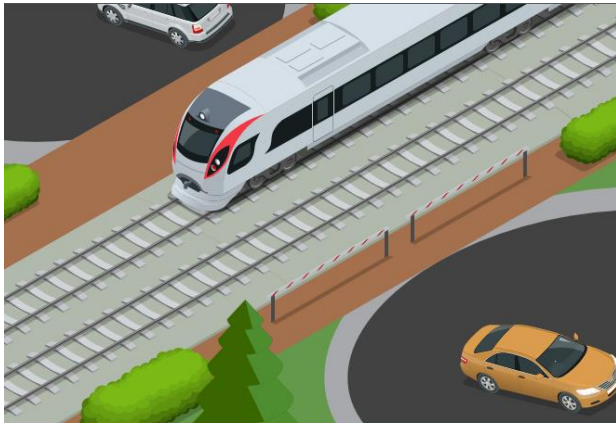


Intrusion Technology

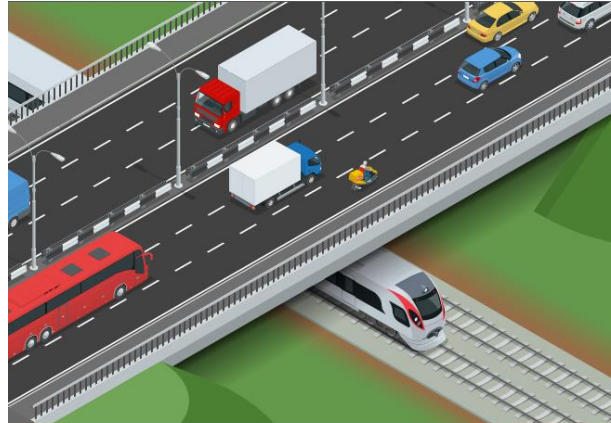


# Grade Crossing Elimination Project Types

Crossing improvements that remove or change the elevation and access to the crossing



Closed Crossing



Grade Separated Crossing



Bike/Pedestrian Crossing

# Spectrum of Estimated Project Costs\*

At-Grade Crossing  
Safety  
Enhancements

Crossing Closures

Bicycle and  
Pedestrian  
Crossings

Larger Grade  
Separations

Mega Projects  
(Multiple  
Crossings)



≤ \$10 M



< \$50 M



< \$75 M



> \$500 M



> \$1 B

← Lowest Cost

→ Highest Cost

\*Costs include planning, design, and construction of treatment in \$2024 dollars.

# DRAFT Grade Crossings Program Benefits



## Enhances Safety

Reduces rail-vehicle, pedestrian, and bicycle conflicts



## Improves Rail Operations

Reduces delays, boosts reliability, and supports electrified service



## Strengthens Community Connectivity

Creates safer, more efficient crossings for all users



## Optimizes Funding & Resources

Secures funding and maximizes investment impact



## Provides a Long-Term Strategy

Establishes a **30+ year plan** for prioritizing & delivering crossing projects



# DRAFT Crossing Prioritization Framework

Iterative and collaborative process utilizing both qualitative and quantitative data coupled with stakeholder input to develop corridor priorities



## Crossing Database

- Compile readily available data
- Support steps in the prioritization process



## Crossing Assessment

- Establish evaluation criteria with corridor partner input
- Assess crossing data, conditions, and project readiness
- Review with corridor partners



## Prioritization

- Sort projects into groups  
safety/readiness benchmarks

# DRAFT Safety Enhancement Prioritization



## Crossing Database

- Rail Crossing Incidents (2017 – 2021)
- Street Traffic Incidents (2017 – 2021)
  - Fatal or severe collisions within 250' of crossing
- Adjusted Annual Average Daily Traffic (Adjusted AADT) (2019 & 2021)



## Crossing Assessment\*

### Evaluation Criteria:

- Total # of Fatal Rail Incidents
- Total # of Rail Incidents
- Total # of Street Incidents per 1,000 adjusted AADT
- **Maximum Score = 4**

\*Crossing assessment completed for all crossings on corridor. UPRR crossings were not included in prioritization as UPRR oversees crossings.



## Prioritization\*

### Group 1

High number of fatal rail incidents and/or rail and street incidents  
(Score  $\geq 3$ )

### Group 2

Moderate rail and/or street incidents  
(Score = 2)

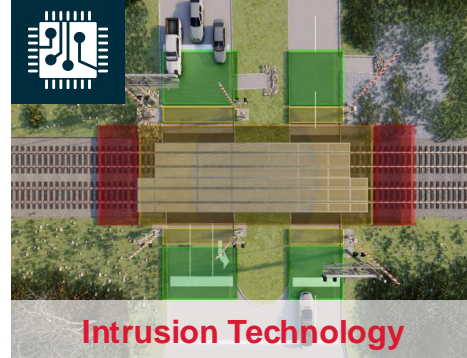
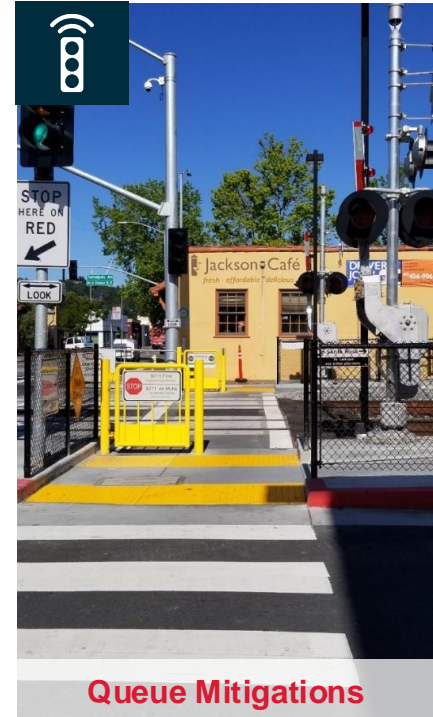
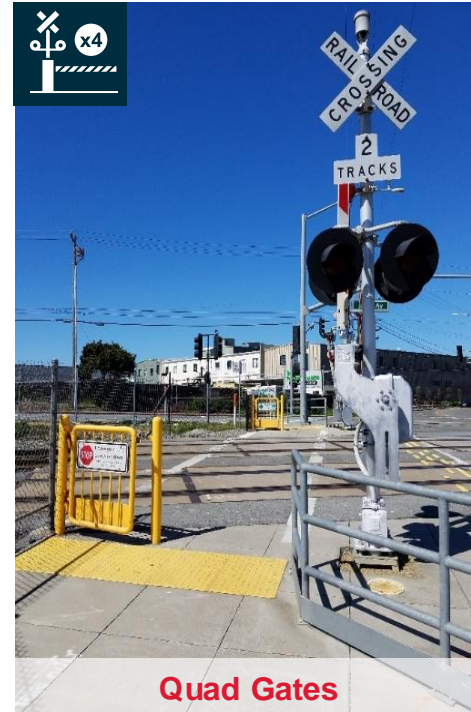
### Group 3

Low rail and/or street incidents  
(Score = 1)

### Group 4

Little or no rail and/or street incidents  
(Score = 0)

# DRAFT Safety Enhancements





# DRAFT Prioritization Framework: Elimination



## Prioritization – Based on Readiness\*

### Group A

Dedicated full or partial construction funds, environmental clearance (NEPA and CEQA, if applicable) and completed Preliminary Engineering.

### Group B

Dedicated full or partial design funds and confirmed Locally Preferred Alternative.

### Group C

Dedicated full or partial Preliminary Engineering funds.

### Group D

Initiation phase







## Crossing Database – For Ranking WITHIN Groups

- Crossing Location Details
- Distance to other crossings
- Rail Crossing Incidents (2017 – 2021)
- Street Traffic Incidents (2017 – 2021)
- Adjusted Annual Average Daily Traffic (Adjusted AADT) (2019 & 2021)
- Population and Employment Characteristics
- Destinations
- Modes at crossing (bike/pedestrian/transit access)
- Active Project Phases
- Dedicated Funding

\*Based on current Active Project Phase and dedicated funding.

# DRAFT Crossing Scoring: Elimination

Goal	 <p>Safe and Equitable Mobility</p>	 <p>Equity Priority Community Benefits</p>	 <p>Cost Efficiencies &amp; Reliable Funding Implementable Program</p>	 <p>Maximize Rail Corridor Utility</p>
Evaluation Criteria*	<ul style="list-style-type: none"> <li>• Fatal Rail Incident AND/OR Fatal/Severe Street Incident</li> <li>• Bike AND Pedestrian Access</li> <li>• High Speed Facility (<math>\geq</math> 55 MPH)</li> <li>• Total Street Incidents per 1,000 Adjusted AADT</li> <li>• Gate Downtime Growth <math>\geq</math> 75%</li> </ul>	<ul style="list-style-type: none"> <li>• Within 0.5 Miles of a School</li> <li>• Within Equity Priority Community</li> </ul>	<ul style="list-style-type: none"> <li>• Within 0.25 Miles of Another Crossing</li> <li>• Active Project Phase</li> <li>• Dedicated Local/County, State, AND/OR Federal Funding</li> </ul>	<ul style="list-style-type: none"> <li>• Identified in a 4-Track segment</li> <li>• Identified in a 4-Track segment needed for Caltrain Adopted Service Vision</li> </ul>

\*For ranking WITHIN groups. Equally weighted except for project phase.

# Program Communication Plan

## March

### Present DRAFT Methodology:

- 03/19: City/County Staff Coordination Group (CSCG)
- **03/26: Joint Powers Board (JPB) Advocacy and Major Projects (AMP)**
- 03/27: Local Policy Maker Group (LPMG)
- Transportation Authority (TA) Review

## May

### Send DRAFT Report to TAs/CSCG/LPMG

### Present DRAFT Project List:

- 5/20: CSCG
- 5/21: LPMG
- **5/28: AMP**

## July/August

### Program Endorsement:

- **7/23: AMP**
- **8/7: JPB**

Incorporate comments

## April

### Present DRAFT Project List:

- **6/5: JPB**

## June





# *Corridor Crossings*

STRATEGY



*Advocacy and Major Projects*

03.26.2025



# Crossing Database: Safety-Related Data



## Rail Crossing Incidents (2017 – 2021)

- Fatal Incidents
- Non-Fatal Incidents
- Apparent Suicide Attempt
- Apparent Car Stall
- Pedestrian Involved
- Cyclist Involved

Source: FRA Safety Data (Highway-Rail Grade Crossing Accident/Incident Report)



## Roadway Traffic Incidents (2017 – 2021)

- Fatal Incidents
- Severe Incidents
- Other Injury Incidents
- Pedestrian Involved
- Bicycle Involved

Source: UC Berkeley Transportation Injury Mapping System (TIMS)





## Adjusted Annual Average Daily Traffic (Adjusted AADT) (2019 & 2021)

- Adjusted Replica AADT
- Caltrain Business Plan ADT

Source: Replica 2019 and 2021 Annual Average Daily Traffic (AADT), Caltrain 2020 Business Plan

# DRAFT Crossing Assessment: Safety Enhancements

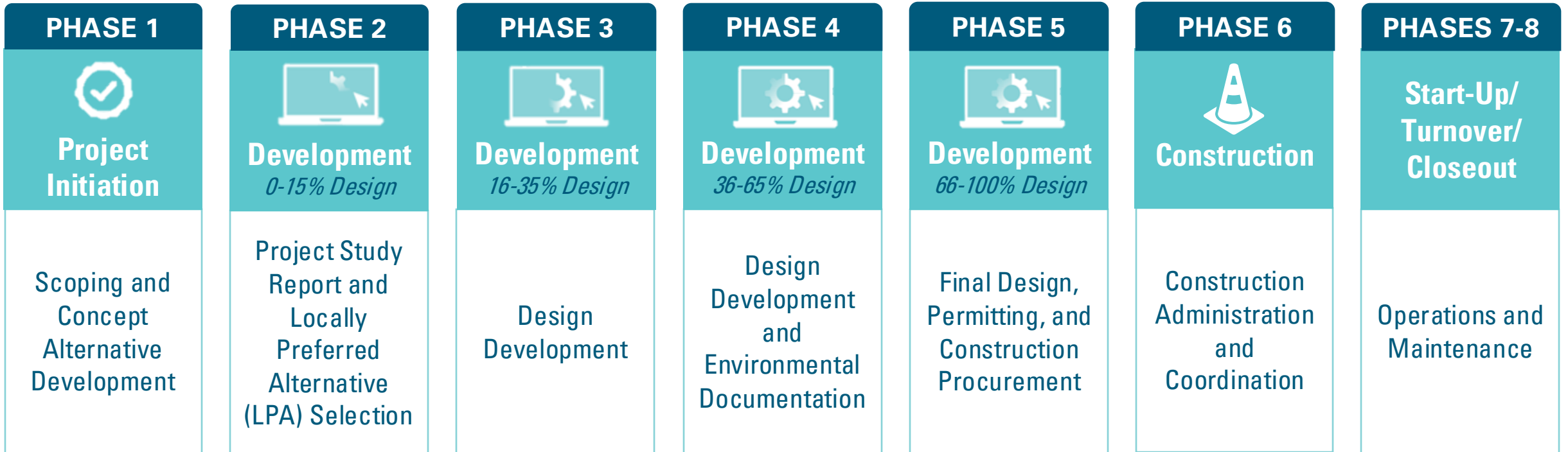
Evaluation Criteria	Factors	Scoring
 <b>Rail Crossing Incidents</b>	<b>Fatal Rail Incidents</b> <ul style="list-style-type: none"> <li>Number of killed persons in crossing accident/incident report is at least 1</li> </ul>	<b>Fatal Rail Incidents</b> <ul style="list-style-type: none"> <li>2 or more incidents = 2</li> <li>1 incident = 1</li> <li>No incident = 0</li> </ul>
	<b>Total Rail Incidents</b> <ul style="list-style-type: none"> <li>Total number of accident/incident report at crossing</li> </ul>	<b>Total Rail Incidents</b> <ul style="list-style-type: none"> <li>Rail incident occurred = 1</li> <li>No incident = 0</li> </ul>
 <b>Street Incident - AADT Ratio</b>	<b>Street Incident - AADT Ratio</b> <ul style="list-style-type: none"> <li>Ratio = Total street incidents per 1,000 adjusted AADT</li> <li>Identify crossings with a high number of street incidents and low AADT</li> </ul>	<b>Street Incident - AADT Ratio</b> <ul style="list-style-type: none"> <li>Ratio equal to or greater than 0.74 (75<sup>th</sup> percentile excluding 0 street incidents) = 1</li> <li>Ratio less than 0.74 = 0</li> </ul>



# Detailed Delivery Process

*City Led*

*Caltrain Led*



# DRAFT Crossing Assessment: Elimination

Evaluation Criteria	Factors	Scoring	
Safe and Equitable Mobility	Fatal Rail Incidents	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Fatal rail and/or fatal/severe street incidents</li> <li>• <b>No:</b> No fatal rail or fatal/severe street incidents</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	Fatal/Severe Street Incidents		
	Bike and Pedestrian Facilities	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Bicycle and pedestrian facilities present</li> <li>• <b>No:</b> No bicycle or pedestrian facilities present</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	Posted Speed Limit	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Street posted speed limit <math>\geq</math> 55 MPH</li> <li>• <b>No:</b> Street posted speed limit <math>&lt;</math> 55 MPH</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	Street Incident – AADT Ratio	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Top quartile of Street Incident – AADT ratio</li> <li>• <b>No:</b> Not part of the top quartile of ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	Existing Gate Down Time (GDT)	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Future GDT is <math>\geq</math> 75% than existing GDT</li> <li>• <b>No:</b> Future GDT is <math>&lt;</math> 74% than existing GDT</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	Future Gate Down Time (GDT)		

# DRAFT Crossing Assessment: Elimination

Goal	Factor	Scoring	
Cost Efficiencies & Reliable Funding/ Implementable Project	Crossing Location	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Within 0.25 miles of another crossing</li> <li>• <b>No:</b> More than 0.25 miles of another crossing</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	Project Phase	<ul style="list-style-type: none"> <li>• <b>Phase 1:</b> Initiation</li> <li>• <b>Phase 2:</b> Planning</li> <li>• <b>Phase 3:</b> Design (35%)</li> <li>• <b>Phase 4:</b> Design (65%)</li> <li>• <b>Phase 5:</b> Design (100%)</li> <li>• <b>Phase 6:</b> Construction</li> </ul>	<ul style="list-style-type: none"> <li>• Phase 1 or 2 = 1</li> <li>• Phase 3 = 2</li> <li>• Phase 4-6 = 3</li> </ul>
	Local/County Funding	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Crossing has local and/or county dedicated funding</li> <li>• <b>No:</b> No local/county funding dedicated</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	State/Federal Funding	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Crossing has state and/or federal dedicated funding</li> <li>• <b>No:</b> No state/federal funding is dedicated</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>



# DRAFT Crossing Assessment: Elimination

Evaluation Criteria	Factors	Scoring	
Equity Priority Community Benefits	Distance to Nearest Crossing	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Within 0.5 miles of a school</li> <li>• <b>No:</b> Not within 0.5 miles of a school</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	MTC Plan Bay Area	<ul style="list-style-type: none"> <li>• <b>Yes:</b> Within an equity priority community</li> <li>• <b>No:</b> Not within an equity priority community</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
Maximize Rail Corridor Utility	Adopted Service Vision 4-Track Segments	<ul style="list-style-type: none"> <li>• <b>Yes:</b> In a 4-track segment</li> <li>• <b>No:</b> Not in a 4-track segment</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>
	4-Track Segment Needed for Caltrain Adopted Service Vision	<ul style="list-style-type: none"> <li>• <b>Yes:</b> 4-track segment needed for Caltrain ASV</li> <li>• <b>No:</b> 4-track segment not needed for Caltrain ASV</li> </ul>	<ul style="list-style-type: none"> <li>• Yes = 1</li> <li>• No = 0</li> </ul>

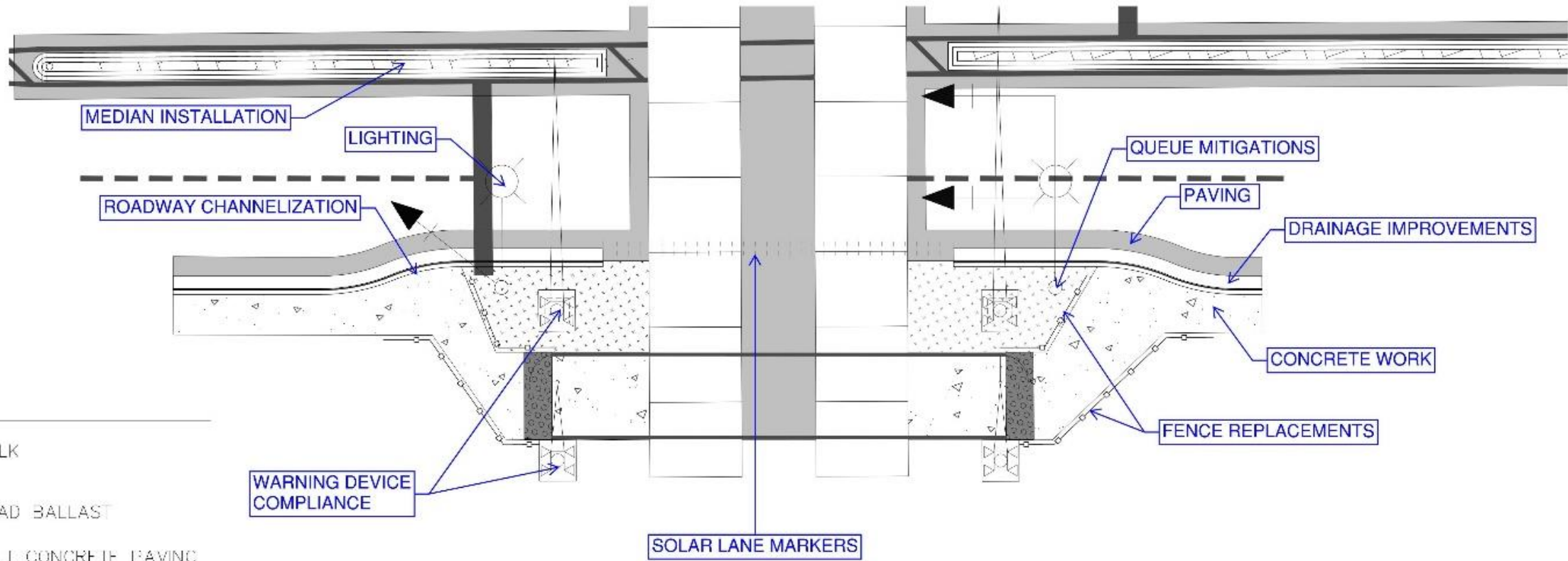
# California Public Utilities Commission (CPUC)

- **Section 130 Funding Program: Safety Improvements**
  - *Only for at-grade highway rail or pedestrian crossings*
  - CPUC staff select and evaluate candidate crossings - *solicit input from railroad agencies*
  - CPUC develops Priority List from select crossings on annual basis
- **Section 190 Funding: Grade Separation**
  - *Only for new construction or alteration/reconstruction of grade separations*
  - Local agencies submit applications at end of each odd-numbered year
  - CPUC applies specific formula to rank crossings
  - CPUC publishes list to prioritize and allocate available funds for the fiscal year

**CPUC Priority List rankings were not considered in prioritization for Safety Enhancements or Elimination Projects; however, similar data was used.**

*CPUC Priority List rankings do not consider all crossings along the corridor. This prioritization will be used to identify the crossings for input to CPUC.*

# DRAFT Safety Enhancement Standardized Template



## LEGEND

-  SIDEWALK
-  RAILROAD BALLAST
-  ASPHALT CONCRETE PAVING (ROADWAY)
-  DETECTABLE WARNING SURFACE
-  FENCING (H=42" MAX)

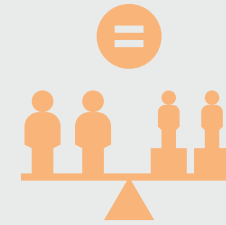
# Crossing Database



## Demand & Growth

- Daily Traffic (Average Annual)
- Roadway Segment Capacity
- Daily Traffic (Average Annual) vs Roadway Segment Capacity Ratio
- Population
- Employment
- Anticipated Annual Growth (2015-2050)

Source: Replica 2019 and 2021 Annual Average Daily Traffic (AADT), Caltrain 2020 Business Plan, and Caltrans Functional Classification



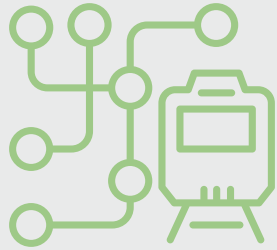
## Equity

- Seniors, People of Color, and Low-Income Population
- Household Income
- Area Median Income (AMI)

Sources: 1. MTC EPC Data (Accessed December 2022). 2. 2019 ACS 5-Year Estimates Table B19001 Block Group (Accessed April 2023). 3. U.S. Department of Housing and Urban Development (HUD) Comprehensive Housing Affordability Strategy (CHAS) 2019 ACS 5-Year Average (Accessed April 2023).



# Crossing Database

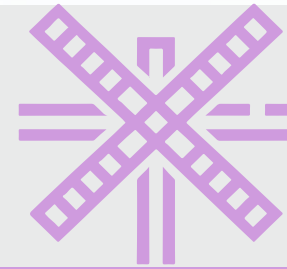


## Connectivity

- Crossing by Mode (Max Distance)
- Mode Split (All Trips)
- Number of Trains in Peak Hour
- Gate Down Time (Average Minutes in Peak Hour)

### Sources:

1. Crossings for pedestrian mode include crossings where pedestrian access is provided (e.g., sidewalk in one or both directions) or the crossing is a designated pedestrian crossing. 2. Crossings for bicycle mode include crossings where Class I, II or IV are present at the crossing or the crossing is a designated pedestrian crossing. 3. FRA Crossing Inventory and PCJPB Track Chart (Accessed March 2023); MTC Transit and Bike Facilities Layers (Accessed December 2022). 4. Replica Trips by Origin Data (Accessed March 2023). 5. Caltrain 2020 Business Plan and 2040 Long Range Service Vision (Accessed March 2023). 6. Caltrain 2020 Business Plan (Accessed March 2023).



## Safety

- Rail Crossing Incidents (2017-2021)
- Street Traffic Incidents (2017-2021)
- Incidents/Crossings

Sources: 1. FRA Safety Data (Highway-Rail Grade Crossing Accident/Incident Report) (Accessed February 2023).

2. Transportation Injury Mapping System (TIMS) (Accessed February 2023).