Solano Rail Crossings Safety Improvements Plan Update Final Final Hettigs Rd Hettigs Rd Hettigs Rd





Solano Rail Crossings Safety Improvements Plan Update

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Executive Summary

The Solano Transportation Authority (STA) completed the original Solano Rail Crossing Inventory and Improvement Plan (Plan) in 2011, which created a comprehensive inventory of rail crossings in Solano County (County) and identified a prioritized list of rail crossing safety projects. An update to the project list and improvements was then updated as part of the Solano Rail Facilities Plan Update in 2015.

This plan is an update to the previous plans by identifying rail crossing safety projects using updated data and prioritizes the grade crossings that are in most need of the safety improvements.

Solano County has 138 rail crossings, which includes 22 in Fairfield, 35 in Benicia, 4 in Dixon, 4 in Suisun City, 29 in Vallejo, and 44 in Unincorporated areas.

Of the 138 total crossings, a total of 133 incidents occurred at 39 crossings.

- 127 incidents were collisions and six incidents were near misses.
- There were 42 train related incidents, and from those incidents, 12 involved fatalities, 11 involved injuries, and 19 resulted in no injuries.
- There were 85 total incidents recorded that occurred at rail crossings but where a train was not directly involved. These incidents include Vehicle/Vehicle, Vehicle/Pedestrian and Vehicle/Bicycle incidents. Of these non-train related incidents, none involved a fatality, 35 resulted in injuries and 50 resulted in no injuries.
- The 10 train crossings with more than one train related incidents encompass a total 37 out of the total 42 train-related incidents.
- The 14 train crossings with more than one non-train related incidents encompass a total 72 out of the total 85 non-train related incidents.

Table E-1 presents a list of those crossings that have more than one train related and/or more than one non-train related incident. Table E-2 presents a list of crossings that have one or more fatalities. The full list of crossings with incidents is provided in the Appendix.

Table E- 1: Summary of Incidents by Crossing							
Crossing		lurisdiction	Number of Incidents				
Crossing	DOTINO.	Jurisalction	Train	Non-Train	Total		
Midway Road	751255U	Unincorporated	7	17	24		
Canon Road	751291P	Fairfield	9	2	11		
		Unincorporated					
Pitt School Road	751254M	County	1	5	6		
Sunset Avenue	7512955	Suisun City	4	2	6		



Table E- 1: Summary of Incidents by Crossing							
Crossing		luniadiatian	Number of Incidents				
Crossing	DOTINO.	Jurisalction	Train	Non-Train	Total		
Industrial Way	751550Y	Benicia	3	0	3		
Fry Road	751289N	Unincorporated	1	3	4		
Elmira Road	751288G	Unincorporated	3	1	4		
Fox Road	751258P	Unincorporated	2	0	2		
Chadbourne Road	751491Y	Unincorporated	2	0	2		
East Tabor Avenue	751294K	Fairfield	1	0	1		
Rio Dixon Road	687614J	Unincorporated	0	13	13		
Red Top Road	751317P	Unincorporated	0	12	12		
Park Road	751548X	Benicia	0	3	3		
Lopes Road	751313M	Fairfield	0	3	3		
Pennsylvania Avenue	751300L	Suisun City	0	2	2		
Pedrick Road	751248J	Dixon	0	2	2		
Park Road	751558D	Benicia	0	2	2		
Gate Road	687605K	Fairfield	0	2	2		

Table E- 2: Summary of Fatalities by Crossing						
	lurisdiction	Number of Fatalities				
DOT NO.	Julisaletion	Train	Non-Train	Total		
751250K	1st Street	1	0	1		
751254M	Pitt School Road	1	0	1		
751255U	Midway Road	1	0	1		
751256B	Batavia Road	1	0	1		
751258P	Fox Road	1	0	1		
751288G	Elmira Road	1	0	1		
751294K	East Tabor Avenue	1	0	1		
751295S	Sunset Avenue	3	0	3		
751491Y	Chadborn Road	1	0	1		
751493M	Private Industry	1	0	1		

A methodology was developed to utilize existing data to prioritize the crossings to determine regional priorities and potential improvements. The prioritization process was based on data collected from various sources to understand safety concerns and issues at at-grade crossings for drivers and pedestrians. The data collected included:

- Grade Crossing Locations initial list of crossings from the 2015 Solano Rail Facilities Plan and supplemented by the latest Federal Railroad Administration and California Public Utilities Commission inventory databases
- Incidents collected from the Federal Railroad Administration (FRA), Statewide Integrated Traffic Records System (SWITRS), and Capital Corridor Joint Powers Authority (CCJPA)



- Key Facilities the key facilities are used as a proxy for potential exposure for vulnerable populations. Key facilities were defined schools, senior centers/community centers, transit stations, industrial centers, large employment centers, parks, or government centers.
- Traffic Volumes where available, average daily traffic volumes were collected from the local jurisdictions. Traffic volumes are used compare the probability of exposure to conflicts with vehicles.
- Train Speed and Volumes Train speed and volumes were taken into account to measure the frequency of trains at a crossing and the speed, which is a measure of severity of a potential incident.
- Project Readiness this criteria includes plans or improvements the local agencies have completed or are in the process of completing to enhance the safety of the at grade crossing locations.

Each of these metrics was assigned a graphical level of importance into certain categorized as shown in Figure E-1.



Figure E-1 – Ranking Levels of Importance

Several of the criteria were evaluated and assigned a level of importance based on two or more criteria subsets. For example, incidents at the crossing will be assigned a level of importance based on both the total number of incidents, and number of fatalities at the crossing. If different levels of importance are assigned to a single criteria for a crossing, the highest level of importance was used for final prioritization and evaluation.

Based on the prioritization methodology, a list of prioritized grade crossings with their respective safety improvements was developed. Each of these locations has associated recommended safety measures, where the safety measures were recommended based on a toolbox approach and a high-level review of each location. They were not based on engineering analysis or field visits.

The types of improvements recommended have shorter-term implementation timelines focused on immediate safety impacts including:



- Gates and barrier arms
- Traffic signalization
- Enhanced Striping and signage
- Improved lighting
- Relocating driveways.

The short-term improvements are the focus of this Plan and can be implemented while grade separation is being pursued. Grade separation is the most ideal safety improvement because it eliminates conflicts with trains; however, it is expensive and time consuming to implement. There are important overcrossing projects that are being pursued in tandem with lower cost alternatives presented in this Plan as shown in the prioritization of the locations. The recommended improvements and the associated order of magnitude costs are provided in Appendix D.

Table E-3 shows the results of the prioritization process, which grouped crossings in rankings based on safety-related metrics, costs, and project readiness. The crossings with higher safety concerns (more incidents) and projects that are already in the planning or design process (high project readiness) are in the top rankings. Those with lower project readiness, but still have high safety concerns, are in the next tier of rankings. These rankings are used to determine regional priorities and can help with future funding opportunities. Potential funding sources are described in the memo that include federal, state, and regional funds.



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	Table E-3 – Tier 1 Railroad Crossing Prioritization Matrix						
Ranking	Location	Incidents	Proximity to Key Facilities	Traffic Volumes	Train Speed and Volumes	Capital Costs	Project Readiness
1 - 7	East Tabor Ave (Fairfield), 1st St (Dixon), Pitt School Rd (Uninc), Sunset Ave (Suisun City), Canon Rd (Fairfield), Pedestrian Xing (Solano Rail Hub) (Suisun City), Midway (Uninc)				L	L	
8-12	Elmira Rd (Uninc), Industrial Way (Benicia), Batavia Rd(Uninc), Fox Rd (Uninc), Fox Rd (Uninc)				L	L	L
13-19	Chadbourne Rd (Uninc), Rio Dixon Rd (Uninc), Red Top Rd (Uninc) Fry Rd (Uninc), Robben Rd (Uninc), Hawkins Rd (Uninc), Lewis Rd (Uninc)					L	\bigcirc
20-30	Valle Vista Avenue (Vallejo), Ped Xing (Vallejo), Valle Vista Avenue (Vallejo), Nebraska (Vallejo), Florida Street (Vallejo), Georgia Street (Vallejo), Maine Street (Vallejo), Sereno Drive (Vallejo), Redwood Street(Vallejo), Lopes Road (Fairfield), Hwy 37 / Lewis Brown Dr (Vallejo)					L	
31+	Solano Avenue (Vallejo), Nebraska Street (Vallejo), Louisiana Street (Vallejo), Wilson Avenue (Vallejo), Mini Drive (Vallejo), Tennessee Street (Vallejo), Curtola Parkway (Vallejo), Mississippi Street (Vallejo), Mare Island Way (Vallejo), Sonoma Blvd (SR 29) (Vallejo)		L				



1.0 BACKGROUND AND PURPOSE

The Solano Transportation Authority (STA) completed the original Solano Rail Crossing Inventory and Improvement Plan (Plan) in 2011, which created a comprehensive inventory of rail crossings in Solano County (County) and identified a prioritized list of rail crossing safety projects. An update to the project list and improvements was then updated as part of the Solano Rail Facilities Plan Update in 2015.

Since the last update of the Plan, there have been an increasing number of incidents at at-grade railroad crossings involving trains, vehicles, and pedestrians. Over that same period, there has been an increase in vehicle, pedestrian, and bicycle traffic crossing the railroad tracks in Solano County.

The Solano Rail Crossing Safety Improvements Plan Update identifies at-grade crossings that frequently experience incidents with trains and are in need of safety improvements. The purpose of the Plan is to prioritize rail crossing safety improvement projects in Solano County that will be used to pursue grant funding to deliver the improvements.

2.0 REPORT ORGANIZATION

The Solano Rail Crossing Safety Improvements Plan Update documents the process to inventory, analyze, and prioritize the rail crossings and recommend appropriate improvements. This report incorporates feedback from the local agencies in the County as part of the Project Leadership Team, which included Public Works staff from the cities of Benicia, Dixon, Fairfield, Suisun City, Vallejo, and the Unincorporated County. The Project Leadership Team provided information for the data collection process. They also provided feedback on the prioritization methodology and ultimate recommendations included in this report. This report is organized into the following sections.

- 3.0 Inventory Update this section describes the data sources and data types used for the prioritization.
- 4.0 Prioritization Criteria and Methodology this section describes the criteria and methodology used to prioritize the at grade crossings.
- 5.0 Grade Crossing Improvements this section describes the suite of safety improvements recommended for at grade crossings for each location including high-level estimate of costs.
- 6.0 Cost Estimates this section describes the assumptions used to generate cost estimates for the proposed improvements
- 7.0 Prioritization Results this section describes the results of the prioritization analysis.



• 8.0-10.0 – Funding – this section describes potential funding source including federal, state, and regional funding.

3.0 INVENTORY UPDATE

Detailed inventory data was gathered from various sources and included the following:

- Grade Crossing Locations
- Incidents
- Key Facilities
- Future Developments
- Traffic Volumes
- Train Speed
- Train Volumes

Each of these data elements is described below including brief summaries of the findings.

3.1. Grade Crossing Locations

The initial list of crossings that was used came from the 2015 Solano Rail Facilities Plan and cross-checked with the latest Federal Railroad Administration and California Public Utilities Commission inventory databases. Only crossings listed in either database were maintained in this version of the plan update. Additional crossings provided in the 2015 Plan that were not recorded in these websites were removed from the inventory database of Salano County crossings as these crossings are not considered within the purview of being regulated by the Federal Railroad Administration or the California Public Utilities Commission. Additionally, the inventory includes all private crossings, but these crossings would not be considered for safety improvements under the Solano Rail Crossing Safety Improvements Plan Update given that they are not publicly operated and maintained and fall out of the jurisdiction of the local agencies. A full list of the crossings are provided in Appendix A.

Federal Railroad Administration (FRA)

The Federal Railroad Administration oversees the movement of people and goods by providing safe, reliable, and efficient rail infrastructure. The FRA data was downloaded from the FRA website in May 2023 which contained data updated through April 2023. The information is updated monthly by both the state (CPUC) and railroads. The data gathered from the FRA website includes the following.

- Crossing Data (crossing number, roadway name, jurisdiction, primary rail operator, rail line and subdivision, etc.)
- Average Annual Daily Traffic (AADT) Volumes and Year
- Train Speed and Frequency



California Public Utilities Commission (CPUC)

The CPUC oversees utilities in California. Within the CPUC is the Rail Safety Division, which is responsible for the safety and regulation of rail crossings, railroads, and transit rail. Although the FRA database serves as the primary data source, CPUC data was used to supplement and verify FRA data. CPUC inventory data includes crossing data such as crossing number, roadway name, jurisdiction, primary rail operator, rail line and subdivision, etc. Some crossings that appeared in CPUC did not appear in FRA inventory and were added to the database grade crossing list accordingly. The two databases are not updated on the same timelines, so typically there will be inconsistencies between the two databases.

3.2. Incidents

Incident data was gathered from three sources including the FRA and Statewide Integrated Traffic Records System (SWITRS) databases, as well as from Capital Corridor.

FRA Data

All Train/Vehicle, Train/Bicycle, and Train/Passenger grade crossing incidents resulting in a non-injury, injury, or fatality between January 2012 and April 2023 (10 years and 4 months duration) were gathered. This data was added to the inventory and was crosschecked with the other data sources to eliminate duplicates. The incidents are documented in Appendix B.

Statewide Integrated Traffic Records System (SWITRS) Data

The SWITRS incident data is updated annually for both train and non-train related incidents. The SWITRS query provides a list of incidents for the past 10 years (Jan 2012 to Dec 2022). The data was post-processed in ArcGIS to reflect only incidents within 200 feet of a rail crossing. All SWITRS data was added to the inventory and documented collisions were cross-checked with the other data sources to eliminate duplicates.

Capital Corridor Data

Incident data, which consists of near misses, was provided by the Capital Corridors Joint Powers Authority (CCJPA). The CCJPA is an intercity passenger rail service connecting 8 counties in Northern California, including Solano County. It is a partnership of six transit agencies that manage the operations of the rail line. The near miss data is aggregated from reports from train operators along the Capital Corridor routes.

From these three data sources, the following is an overall summary of the incidents. Of the 138 total crossings, a total of 133 incidents occurred at 39 crossings.

- 127 incidents were collisions and six incidents were near misses.
- There were 42 train related incidents, and from those incidents, 12 involved fatalities, 11 involved injuries, and 19 resulted in no injuries.
- There were 85 total incidents recorded that occurred at rail crossings but where a train was not directly involved. These incidents include Vehicle/Vehicle,

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Vehicle/Pedestrian and Vehicle/Bicycle incidents. Of these non-train related incidents, none involved a fatality, 35 resulted in injuries and 50 resulted in no injuries.

- The 10 train crossings with more than one train related incidents encompass a total 37 out of the total 42 train-related incidents.
- The 14 train crossings with more than one non-train related incidents encompass a total 72 out of the total 85 non-train related incidents.

Table 1 presents a list of those crossings that have more than one train related and/or more than one non-train related incident. Table 2 illustrates a list of crossings with at least one fatality. The full list of crossings with incidents is provided in the Appendix.

Table 1: Summary of Incidents by Crossing						
Crossing		lurisdiction	Number of Incidents			
Crossing	DOT NO.	Jurisalction	Train	Non-Train	Total	
Midway Road	751255U	Unincorporated	7	17	24	
Canon Road	751291P	Fairfield	9	2	11	
Pitt School Road	751254M	Unincorporated County	1	5	6	
Sunset Avenue	751295S	Suisun City	4	2	6	
Industrial Way	751550Y	Benicia	3	0	3	
Fry Road	751289N	Unincorporated	1	3	4	
Elmira Road	751288G	Unincorporated	3	1	4	
Fox Road	751258P	Unincorporated	2	0	2	
Chadbourne Road	751491Y	Unincorporated	2	0	2	
East Tabor Avenue	751294K	Fairfield	1	0	1	
Rio Dixon Road	687614J	Unincorporated	0	13	13	
Red Top Road	751317P	Unincorporated	0	12	12	
Park Road	751548X	Benicia	0	3	3	
Lopes Road	751313M	Fairfield	0	3	3	
Pennsylvania Avenue	751300L	Suisun City	0	2	2	
Pedrick Road	751248J	Dixon	0	2	2	
Park Road	751558D	Benicia	0	2	2	
Gate Road	687605K	Fairfield	0	2	2	



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Table 2: Summary of Fatalities by Crossing						
	lurisdiction	Number of Fatalities				
DOT NO.	Julisaletion	Train	Non-Train	Total		
751250K	1st Street	1	0	1		
751254M	Pitt School Road	1	0	1		
751255U	Midway Road	1	0	1		
751256B	Batavia Road	1	0	1		
751258P	Fox Road	1	0	1		
751288G	Elmira Road	1	0	1		
751294K	East Tabor Avenue	1	0	1		
751295S	Sunset Avenue	3	0	3		
751491Y	Chadborn Road	1	0	1		
751493M	Private Industry	1	0	1		

4.0 PRIORITIZATION CRITERIA AND METHODOLOGY

The grade crossings were prioritized to identify higher priority locations because there are limited resources available to improve all of the crossings. The prioritization helps identify tiers of crossings that would have higher impact to the safety of the surrounding area and shows a strategic approach to grant funding opportunities. The prioritization process was iterative, with each of the evaluation criteria being weighted relative to their individual perceived safety risk and/or the capital cost to implement the recommended safety improvements.

Initial assessment of the crossings was based on reported incidents and/or proximity to key facilities. These crossings are referred to as Tier 1 crossings and were further evaluated and prioritized based on the remainder of the evaluation criteria. Crossings with no recorded incidents in the past five (5) years or are not in the defined proximity to key facilities were noted as low priority crossings in the report without further evaluation or recommended improvements.

4.1. Criteria Evaluation and Ranking

All applicable evaluation criteria for each crossing were assigned a graphical level of importance categorized by the following:

	Most Important	Somewhat Important
L	Very Important	Important

Figure 1 – Level of Importance Categories



Many of the criteria were evaluated and assigned a level of importance based on two or more criteria subsets. For example, incidents at the crossing were assigned a level of importance based on both the total number of incidents and number of fatalities at the crossing. If different levels of importance are assigned to a single criteria for a crossing, the highest level of importance was used for final prioritization and evaluation.

4.2. Incidents

All crossings with one or more incidents were assigned a level of importance to be considered in the prioritization process. Type and frequency of incidents were evaluated to determine the perceived safety risk, which were determined as follows:

Table 4 – Levels of Importance - Incidents				
Type of Incident	Number of Incidents	Level of Importance		
Fatalities	1 or more			
Injuries	2 or more			
	1			
Collision (No Injuries) and Near Misses	2 or more			
	1			

4.3. Proximity to Key Facilities

Key facilities were considered as part of the prioritization process because of the likelihood of higher volumes of people nearby, especially vulnerable populations at senior centers and schools. Key facility information was based on the facility types listed below, with those facilities located within a ½ and ¼ mile from the crossings identified. Key facility proximity information is provided in the Appendix.

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- Schools
- Senior centers/Community Centers
- Transit Stations/Centers
- Industrial Centers
- Large Employment Centers
- Parks



• Government Centers.

The locations of bus stops, hospitals, government buildings, community centers, Amtrak stations, and parks were provided directly by the County of Solano County Department of Information Technology. The location of schools, industrial centers, and large employment areas were not provided.

Where comprehensive information for the County of Solano was not directly provided, data was derived by the land use designated by the online Solano County Parcel services and supplemented by data as provided by the Suisun City and City of Fairfield where available. To confirm this methodology, the location of County provided location points was compared against relevant parcels from the Online GIS Portal.

From the data gathered, the following is an overall summary of the key facilities.

- Schools 22 crossings are within a ½ mile and six within a ¼ mile
- Senior/Community Centers Seven crossings are within a ½ mile and four within a ¼ mile
- Transit Stop/Center 35 crossings are within a ½ mile
- Industrial Center 76 crossings are within a ½ mile
- Large Employment Center No crossings are within a ½ mile
- Hospital Two crossings are within a ½ mile
- Park 25 crossings are within a ½ mile
- Government Center One crossing is within a ½ mile

Table 5 provides the indicators of increased safety risks introduced by key facilitieswhen located adjacent to rail crossings.

Table 5 – Risk Indicators by Key Facility Type						
Key Facility Types	Increased Vehicular Volumes	Increased Pedestrian Volumes	Higher Risk Populations	High-Risk Vehicles		
Schools	X	Х	X	Х		
Senior Centers / Community Centers	X	X	X	X		
Transit Stations / Centers	X	X		Х		
Industrial Centers	X			Х		
Large Employment Areas	X					
Hospitals				Х		
Parks		X	X			
Government Centers	X					



4.4. Traffic Volumes

Traffic volumes are an important prioritization metric because streets with higher traffic volumes may be more likely to have rail-related incidents due to higher probability of conflicts with a vehicle.

FRA Data

Where available, Annual Average Daily Traffic (AADT) volumes from the FRA database was used as the primary data source at each rail crossing. However, this data can be as much as ten years old and therefore, were supplemented by additional data sources where possible. If no additional data is available, the base FRA data remained until additional information can be provided at a later time.

Local Agency Data

All jurisdictions contacted to provide traffic volumes where available. This information was used to fill-in gaps within the FRA dataset. Only Suisun City and Fairfield have provided this information. No information from other jurisdictions was available.

Replica Data

Replica data was used to fill in gaps for any locations without FRA and agency-provided data, where no other information is available. While other sources might be aggregated by tube counts or video counts, Replica data is sourced by cell phone data and in-unit GPS data. The data is compiled from comprehensive travel information from the region, as opposed to FRA and local agency data that are intentionally collected at specific crossings and roadway segments. The data is buffered to only include segments that run across the railroad grade crossings.

Traffic volume level of importance was evaluated based on AADTs. Since the risk of future incidents is greater given the number of vehicles passing through the crossing, the level of importance is assigned based on existing or future volumes, whichever is greater, regardless of roadway classification. The traffic volumes selected for the tranches are based on natural breakpoints in the data and traffic engineering principles. Roads of less than 5,000 AADTs are fairly low volume roads with little congestion. Roads of more than 15,000 AADTs are high volume roads, but are not outliers in the data.



Table 6 – Level of Importance – Traffic Volumes				
Existing and Future Average Daily Traffic Volumes	Level of Importance			
More than 15,000	L			
Between 5,000 and 15,000				
Less than 5,000				

4.5. Capital Costs

Capital costs to implement the identified safety improvements were generated during the evaluation process. The safety improvements were identified by evaluating existing crossing infrastructure such as pedestrian facilities, automated gate arms, medians, and/or traffic signal infrastructure relative to the type and frequency of recorded incidents and/or proximity to key facilities. Only those crossings that have recorded incidents or are located near key facilities were assigned initial recommendations for safety improvements.

Rough order of magnitude costs were generated for each qualifying crossing based on recent bid and estimate data for each recommended improvement. Crossings were ranked from highest to lowest estimated capital costs for improvements. Based on the rankings, each crossing falls within the following four percentile categories: above the 95th, between the 75th and 95th, between the 50th and 75th, and below the 50th percentile.

Since level of importance for each criteria directly correlates to the prioritization of a crossing, capital costs that are below the 50th percentile were assigned the highest level of importance since they are considered the most favorable for implementation. Conversely, crossings that require improvements costing in the top 95th percentile for Capital Costs were considered the lowest level of importance (see **Table 7**).

The levels of importance assigned in this category are determined based on the risk to implementing the recommended improvements. Since crossings with recommended safety improvements falling within the 95th percentile of Capital Costs will be the most expensive, they are likely to face greater funding challenges. Additionally, these crossings may result in less funding from other crossings in need of improvements.



Table 7 – Level of Importance – Capital Costs								
Capital Cost	Level of Importance							
Lower than 50 th Percentile								
Between the 50 th and 75 th Percentile	L							
Between the 75 th and 95 th Percentile								
Above the 95 th Percentile								

4.6. **Proximity to Key Facilities**

The level of importance of each key facility is assigned based on the type of facility and, in some cases, how close the facility is to the crossing, as shown in **Table 8**.

Table 8 – Levels of Importance – Key Facilities										
Type of Facility	Proximity	Level of Importance								
School Serier Center (Community	Within ¼ mile									
Center	½ mile to ¼ mile									
 Transit Station / Center Industrial Center Large Employment Area Hospital Park Government Centers 	Within ½ mile									

Schools and senior centers / community centers are sorted into two proximity categories to capture the impact associated with the increased likelihood that the higher risk population associated with those facilities would be pedestrians at the crossing if within ¼-mile, as opposed to ½-mile.



4.7. Future Developments

A separate level of importance table is not provided for Future Developments. The level of importance for this category was assigned based on the criteria set forth for Incidents and/or Proximity to Key Facilities. Like all other criteria rankings, the highest level of importance determined for this criteria was used for final prioritization and evaluation.

4.8. Train Speeds and Volumes

Train speeds and volumes were gathered from the latest FRA inventory database and recorded in the criteria database and will include the following:

- Total Daily Trains number of trains may be less than one per day if volumes are recorded on a weekly basis on the FRA inventory form.
- Maximum Speed (mph)
- Typical Speed Range (mph)

Level of importance for train speeds and volumes was evaluated based first on train speed, followed by the total daily trains at the crossing, as shown in **Table 9** below. Crossings with 12 or more train events per day will be assigned a higher level of importance compared to crossings experiencing similar train speeds with less than 12 trains per day. This is due to the inherent safety risk associated with each train event at a crossing. Twelve was chosen as a threshold because it is the approximate number of commuter rail trains during revenue service periods. This is based on the CCJPA typical weekday train schedule of 12 trains per day.

The speed thresholds were chosen based on typical speeds of a freight train (less than 35mph) and a commuter train (greater than 75mph).



Table 9 – Levels of Importance – Train Speeds and Volumes										
Train Speeds	Daily Trains	Level of Importance								
Greater than 75 mph	12 or more									
Greater than 75 mph	Less than 12									
Between 35 mph and 75 mph	12 or more									
	Less than 12									
	12 or more									
Less than 35 mph	Less than 12	Not Important								

4.9. Project Readiness

The project readiness category recognizes Solano member agencies have already developed plans or projects for the individual grade crossings. Those locations receive a higher score than locations without any project improvement development. The locations with a higher project readiness score already have momentum behind the project development process, which makes them a high priority for the community and a better match for future grant funding.

4.10. Prioritization

Crossings were ultimately be ranked and divided into two tiers, as follows:

- Tier 1 high priority
- Tier 2 low priority

All crossings in Tier 1 will, at a minimum, have either a history of incidents at the crossing, or are located in proximity to a key facility. All crossings without at least one of these qualifying criteria were placed in the Tier 2 category. Within both tiers, crossings were ranked (prioritized) based on their assigned levels of importance.

Crossings in the Tier 1 category were first ranked based on the first two criteria: incidents and proximity to key facilities. Crossings with higher levels of importance in these two criteria were ranked higher relative to crossings with lower levels of importance. The crossings were further ranked based on the levels of importance assigned in the traffic volumes, proximity to key facilities, and train speeds and volumes criteria. Capital costs are the final criteria to be used in the rankings after all other criteria. **Table 10** provides an example of a ranking of crossings in the Tier 1 level.



The levels of importance assigned in this category are determined based on the risk to implementing the recommended improvements. Since crossings with recommended safety improvements falling within the 95th percentile of Capital Costs will be the most expensive, they are likely to face greater funding challenges. Additionally, these crossings may result in less funding from other crossings in need of improvements.

Table 10 – Tier 1 Rankings Example											
Ranking	Incidents	Proximity to Key Facilities	Traffic Volumes	Future Developments	Train Speed and Volumes	Capital Costs	Project Readiness				
1						L					
2			L								
3					L						

Tier 2 crossings are considered low priority and will have been assigned as such given no recorded incidents or proximity to key facilities. These crossings will be ranked based on the levels of importance assigned in the traffic volumes, future developments, and train speed and volumes criteria. Since improvements were not evaluated for Tier 2 crossings, capital costs for improvements were not determined and, therefore, a level of importance related to capital costs were not assigned.

The final crossing prioritization will be presented as a table with each crossing listed in order from highest to lowest priority. This table will include ranking assignment, crossing DOT number, roadway name, all evaluation criteria, assigned level of importance for each category, and the approximate capital cost for each of the qualifying crossings.

Rail Crossing Improvements 4.11.

Rail crossing improvements were identified for each Tier 1 location. For each incident location, the source data was examined to determine the conditions at the time of the incident – speed, location, number of vehicles or pedestrians involved, etc. For all crossings, aerial imagery was used to review visibility, existing improvements, lighting conditions, and signalization. In addition, traffic volumes and traffic patterns were assessed to understand potential contributing factors.

DESCRIPTION OF GRADE CROSSING SAFETY IMPROVEMENT TYPES 5.0

The potential grade crossing improvements described below can be used as stand-alone improvements or can be combined together depending on the need at each specific





crossing location. The types of grade crossing improvements identified and evaluated for the crossings include:

Active Barriers

Active Barriers include automatic gates and flashing lights (flashers) that are triggered when a train is approaching to prevent vehicles and/or pedestrians from crossing the railroad tracks.



Example of Active Barriers

Median Treatments/Channelization/Bulb-outs

Median Treatments can be effective to narrow the effective width of the crossing to provide more visibility to motorists that they are approaching a grade crossing. Raised medians and other channelizing devices are also used to prevent vehicles from driving around the active barriers. These are best applied in locations with wide streets and can be used in low traffic volume locations.





Examples of Median Treatments and Channelization

Driveway Relocations/Modifications

Driveway relocations or modifications are implemented when a driveway is close enough to the tracks that vehicular movements into and/or out of the driveway creates queuing that backs up to the tracks. In addition, this type of improvement can be combined with median treatments and bulbouts to create a narrow footprint for the crossing. These improvements require coordination with private property owners.

Traffic Signalization/Queue Cutter and Railroad Preemption

As a queue management strategy, installing traffic signals at a grade crossing provides a highly visible traffic control mechanism to prevent vehicles from stopping on the railroad tracks. This strategy is referred to as a queue cutter which uses detection that is positioned a certain distance downstream of a crossing to detect vehicle queues. The downstream distance is a function of the volume and speed of the vehicles crossing the tracks such that once the queues are detected, the queue cutter will stop arriving vehicles from crossing the tracks so that the queues will not back up to the tracks.

Railroad preemption uses communications from the railroad's train control system to the traffic signal to notify the traffic signal when a train is approaching the crossing to enable the traffic signal to clear vehicles queued on the tracks and stop arriving vehicles from entering the crossing.





Queue Cutter Example

Railroad Signal Arm Re-orientation

Railroad signal arms should be oriented at a 90-degree angle to the roadway such that the gates and flashers are positioned over and cover up to 90% of the vehicle travel lanes. In locations where the railroad is at skew angle, it is important the signal arm is oriented to provide maximum visibility from the roadway.

Sidewalk Orientation and Automatic Pedestrian Gates

Sidewalks should be oriented for maximum sight visibility to approaching trains at a 90degree angle to the tracks. Pedestrian gates can be used to prevent pedestrians from crossing the tracks when a train is approaching.



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Example of Pedestrian Gate in Use

Enhanced Signage and Striping

Enhanced signage can include grade crossing signs, additional warning signs and striping, such as edge line striping to prevent turning on tracks. At a minimum, signing and striping improvements need to comply with the California Manual on Uniform Traffic Control Devices (CAMUTCD) requirements, which is constantly evolving.





Grade Crossing Warning Signage

Crossing Closure

Closing a crossing is reserved for locations where there are other alternative crossings nearby and where there are a high volume of severe incidents. This requires coordination with the railroad, CPUC and the local jurisdiction, and traffic modeling to determine the impacts to the street network. The decision to close a crossing ultimately rests with the owning jurisdiction (roadway authority).

Grade Separation

The use of grade separation physically separates railroad crossings from all other modes of transportation. This treatment requires high capital improvement costs and extensive design considerations. This option should be reserved for locations with high volumes, high history of incidents, and high implications for delays, typical of dense urban areas. Grade separation is an important, while costly, improvement. This report focuses on lower cost alternatives that provide benefit while grade separation is being pursued. There are active overcrossing projects that were considered in the project readiness criteria as a shorter-term alternative.

5.1. Safety Improvements

Proposed safety improvements were recommended for locations with train-related fatalities, train-related injuries, and high incidence of non-train-related injuries. Non-train-related injuries are defined to be injuries that do not directly involve a train but occur within in the vicinity of the relevant crossing. For example, a vehicle – vehicle collision that results in an injury would be included as a non-train related injury if it occurred close to a train track. There are no non-train-related fatalities. The details of each of the crashes were reviewed to determine potential causes or complicating





factors.

This section defines the proposed safety improvements for each Tier 1 crossing. The improvements are based on best practices and standards but have not been field verified per location. It is assumed the improvements would be implemented by the local jurisdiction (roadway authority).

Table 10 presents a list of those crossings that have recorded incidents resulting in fatalities or injuries, and near misses that are associated or related to the grade crossings along with their recommended safety improvements. Incident data was gathered from three sources including the FRA and Statewide Integrated Traffic Records System (SWITRS) databases, as well as from Capital Corridor. Table 1 summarizes the data from the inventory update. Figure 1 shows the locations of the Tier 1 crossings within the County based on the prioritization in Section 6. Those costs are detailed in Appendix D. Following Table 11, there is a summary of incidents at each crossing and a brief description of recommended improvements and existing conditions.







Figure 1 - Tier 1 Crossings



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Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures										
					Ti	er 1 Crit				
Crossing	DOT No.	Jurisdiction	Railroad	Numbe	r of Incio	lents		Safety Measures		
Ū			Owner	Train	Non- Train	Total	Activity Centers	,		
<u>Park Road</u>	751527E	Benicia	Union Pacific (UP)	1	0	1	Transit centers, industrial centers, and parks	 Striping Signalization Streetlights Median treatment/channelization Roadway elements 		
<u>Industrial</u> <u>Way</u>	751550Y	Benicia		3	0	3	Transit and Industrial centers	 Signage and striping Streetlights Roadway elements Update gate arms from passing to active 		
<u>1st Street</u>	751250K	Dixon	UP	1	1	2	No	 Pedestrian gates Pavement markings Realign sidewalks Median treatment 		
<u>Canon Road</u>	751291P	Fairfield	UP	9	2	11	No	 Signalization and preemption Pavement markings Streetlights Medians/channelization 		
<u>East Tabor</u> <u>Avenue</u>	751294K	Fairfield	UP	1	0	1	School	Median treatmentPavement markings		



Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures									
					Ti	er 1 Crit	eria		
Crossing	DOT No.	Jurisdiction	Railroad	Numbe	r of Incio	lents		Safety Measures	
			Owner	Train	Non- Train	Total	Activity Centers	, , , , , , , , , , , , , , , , , , ,	
								 Curb treatment Pedestrian treatments and sidewalks 	
Lopes Road	751313M	Fairfield	CFNR	0	3	3	Schools, Transit and Industrial Centers	 Signage and striping Median treatment Roadway elements 	
<u>Sunset</u> <u>Avenue</u>	751295S	Suisun City	UP	4	2	6	No	Queue cutterPedestrian gatesSidewalk realignment	
<u>Pedestrian</u> <u>Xing (Solano</u> <u>Rail Hub)</u>	441093N	Suisun City	UP	0	1	1	School, Transit Centers	Trespass mitigationActive Warning DevicesPedestrian improvements	
<u>Pitt School</u> <u>Road</u>	751254M	Unincorporated	UP	1	5	6	No	Pavement markingsBulbout/Road dietSignalization	
<u>Rio Dixon</u> <u>Road</u>	687614J	Unincorporated	Western Railway Museum (WRM)	0	13	13	No	 Active Warning Devices Pavement markings Streetlights Curb and gutter 	
<u>Robben</u> <u>Road</u>	751247C	Unincorporated	UP	1	0	1	No	Signage and stripingStreetlights	



Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures										
					Tie	er 1 Crit	eria			
Crossing	DOT No.	Iurisdiction	Railroad	Numbe	r of Incic	lents		Safety Measures		
			Owner	Train	Non- Train	Total	Proximity to Activity Centers			
								Median treatmentRoadway elements		
<u>Midway</u> <u>Road</u>	751255U	Unincorporated	UP	7	17	24	No	 Pavement markings Streetlights Re-align intersection Median treatment 		
<u>Batavia Road</u>	751256B	Unincorporated	UP	1	0	1	No	 Pavement markings Streetlights Re-orient railroad arm Median treatment 		
Fox Road	751258P	Unincorporated	UP	2	0	2	No	Pavement markingsStreetlightsMedian treatments		
<u>Lewis Road</u>	751259W	Unincorporated	UP	1	0	1	No	 Signage and striping Streetlights Pavement/roadway elements 		
<u>Hawkins</u> <u>Road</u>	751260R	Unincorporated	UP	1	0	1	No	 Streetlights Pavement markings Roadway elements 		





Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures										
					Tie	er 1 Crit	eria			
Crossing	DOT No.	Jurisdiction	Railroad	Numbe	r of Incid	lents	Drovimity to	Safety Measures		
			Owner	Train	Non- Train	Total	Activity Centers			
<u>Elmira Road</u>	751288G	Unincorporated	UP	3	1	4	No	Pavement markingsStreetlightsSignalization		
Fry Road	751289N	Unincorporated	UP	1	3	4	No	 Pavement markings Streetlights Roadway elements Bulbouts 		
<u>Red Top</u> <u>Road</u>	751317P	Unincorporated	CFNR	0	12	12	No	Pavement markingsStreetlightsLandscape maintenance		
<u>Chadbourne</u> <u>Road</u>	751491Y	Unincorporated	UP	2	0	2	No	 Active warning devices Pavement markings Median treatment Streetlights 		
<u>Mini Drive</u>	751462N	Vallejo	CFNR	0	0	0	School, Transit, Parks	 Signalization Streetlights Pavement markings Update roadway elements Pedestrian treatment 		



Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures										
					Ti	er 1 Crit				
Crossing	DOT No.	Jurisdiction	Railroad	Numbe	r of Incid	lents		Safety Measures		
			Owner	Train	Non- Train	Total	Proximity to Activity Centers			
<u>Lewis Brown</u> (Hwy 37)	751463V	Vallejo	CFNR	0	0	0	School, Industrial Center, Parks	 Pavement markings Median treatment Roadway elements Vegetation removal/trimming 		
<u>Redwood</u> <u>Street</u>	9284455	Vallejo	CFNR	0	0	0	School, Industrial Centers, Parks	 Update signage and striping Repaving Pedestrian treatment Streetlights Median treatment 		
<u>Valle Vista</u> <u>Avenue</u>	928446Y	Vallejo	CFNR	0	0	0	School. Hospital	 Pavement markings Pedestrian gates Roadway elements Median treatment 		
<u>Nebraska</u> <u>Street</u>	751468E	Vallejo	CFNR	0	0	0	School, Hospital, Parks	 Signage and striping Pedestrian treatment Median treatment Roadway elements 		
<u>Tennessee</u> <u>Street</u>	751469L	Vallejo	CFNR	0	0	0	School, Industrial Center, Parks	StripingPedestrian treatments		



Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures Tier 1 Criteria Railroad Number of Incidents Safety Measures Crossing DOT No. Jurisdiction Proximity to Owner Non-Activity Centers Train Total Train Roadway elements • Railroad devices • • Pedestrian treatment Streetlights School, Industrial ٠ Louisiana 751470F Vallejo CFNR 0 0 0 Centers, Parks Median treatment ٠ Street Gate arms • Vegetation removal • Signage and striping • School, Pedestrian treatment • Senior/Communit Streetlights ٠ Florida 751472U Vallejo CFNR 0 0 0 y Center, Parks, Median • Street treatment/channelization Government Center Roadway elements • Gate arms ٠ School, Signage • Senior/Communit Streetlights • y Center, Parks, Ped Xing 751473B Vallejo CENR 0 0 0 Gate arms • Government Center



Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures									
					Ti	er 1 Crit	eria		
Crossing	DOT No.	Jurisdiction	Railroad	Numbe	r of Incid	lents		Safety Measures	
, , , , , , , , , , , , , , , , , , ,			Owner	Train	Non- Train	Total	Activity Centers	, ,	
<u>Georgia</u> <u>Street</u>	751474H	Vallejo	CFNR	0	0	0	School, Senior/Communit y Center, Parks, Government Center	 Signage treatment Pavement elements Pedestrian treatment Bulbouts Trim vegetation 	
Maine Street	751475P	Vallejo	CFNR	0	0	0	School, Senior/Communit y Center, Park, Government Center	 Signage and striping Pedestrian treatment Streetlights Roadway elements Bulbouts 	
<u>Solano</u> <u>Avenue</u>	751476W	Vallejo	CFNR	0	0	0	School, Senior/Communit y Center, Parks	 Striping Streetlights Median treatment/channelization Roadway elements 	
<u>Curtola</u> <u>Parkway</u>	751980J	Vallejo	CFNR	0	0	0	School, Senior/Communit y Center, Transit, and Parks	 Pavement markings Streetlights Pedestrian gates and sidewalks Median treatment 	


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Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures										
Crossing	DOT No.	Jurisdiction	Railroad Owner	Tier 1 Criteria						
				Number of Incidents				Safety Measures		
				Train	Non- Train	Total	Activity Centers			
<u>Sereno Drive</u>	928443D	Vallejo	CFNR	0	0	0	School, Hospital, Parks	 Pavement markings Streetlights Pedestrian gates Median treatment Restrict driveways Landscape removal 		
<u>Redwood</u> <u>Street</u>	751466R	Vallejo	CFNR	0	0	0	School, Industrial Centers, Hospitals	Pedestrian treatmentInterconnect/queue cutterGate arms		
<u>Valle Vista</u> <u>Avenue</u>	751467X	Vallejo	CFNR	0	1	1	School, Hospital	 Striping and signage Pre-signal and interconnect Roadway elements 		
<u>Sonoma Blvd</u> (SR 29)	928447F	Vallejo	CFNR	0	0	0	School, Hospital, Parks	 Update signage and striping Repaving Pedestrian treatment Streetlights Median treatment 		



Table 11 – Tier 1 Crossings - Summary of Incidents and Safety Measures									
Crossing	DOT No.	Jurisdiction	Railroad Owner		Ti	er 1 Crit			
				Number of Incidents				Safety Measures	
				Train	Non- Train	Total	Activity Centers	, ,	
<u>Mississippi</u> <u>Street</u>	928448M	Vallejo	CFNR	0	0	0	School, Hospital, Parks	 Signage and striping Pavement repair Pedestrian treatment Streetlights Median treatment/channelization 	
<u>Nebraska</u> <u>Street</u>	928449U	Vallejo	CFNR	0	0	0	School, Parks	 Signage and striping Pavement repair Pedestrian treatment Streetlights Median treatment 	
<u>Wilson</u> Avenue	928450N	Vallejo	CFNR	0	0	0	School, Government Center, Park	 Update signage and striping Pedestrian treatment Roadway elements 	
<u>Mare Island</u> <u>Way</u>	928451V	Vallejo	CFNR	0	0	0	School, Government Center, Parks	 Signage and striping Pedestrian treatment Roadway elements 	



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Benicia

Industrial Way – Benicia (DOT 751550Y)

Industrial Way in the City of Benicia is a Tier 1 crossing because of its close proximity to critical activity centers including a transit center and industrial center.

The recommended safety improvements are:

- Install roadway elements
- Install pavement markings per CA MUTCD
- Install lighting
- Upgrade from passive to active 2 gate arms



Industrial Way Looking South







Industrial Way Looking North

Park Road – Benicia (DOT 751527E)

Park Rd in the City of Benicia is a Tier 1 crossing because of its close proximity to critical activity centers including transit center, industrial center, and parks.

The recommended safety improvements are:

- Install roadway elements
- Install pavement markings per CA MUTCD
- Install medians/channelization devices
- Install traffic signal
- Install lighting







Park Road Looking Southwest



Park Road Looking Northeast

Dixon

1st Street – Dixon (DOT 751250K)

1st Street in Dixon had one fatal incident. A pedestrian was struck and killed. Geometrically, this is a skewed intersection that does not have any traffic control other than the railroad crossing gates. The pedestrian path of travel is not protected from the railroad. The proposed safety improvements are:





- Install automatic pedestrian gates
- Re-align sidewalks to provide better sight distance for pedestrians at the crossing
- Install pavement markings per CA MUTCD
- Channelization or median treatment



1St Street Looking North



1st Street Looking South



Pitt School Road – Unincorporated County (DOT 751254M)

This crossing has one train-related fatal incident and 5 non-train-related incidents. The combination of the incidents resulted in a total of 1 death and 8 injuries at this crossing with one incident involving 2 injuries, another involving 3 injuries, and one injury for each remaining incident. The fatal crash resulted in one fatality and no injuries.

The train-related fatality was the result of a train striking an occupied vehicle. The occupied vehicle proceeded past the gate and stopped on the Pitt School Road crossing. Upon being struck by the train, the vehicle caught fire, killing the one passenger in the occupied vehicle.

The 5 non-train related incidents were all broadside collisions with 3 injuries with complaints of pain and 2 with visible injuries. Of the 5 incidents, 2 were the result of traffic signals and signs violation, 2 violated automobile right-of-way, and 1 was due to unsafe starting or backing. All incidents occurred during daylight; 1 incident occurred during cloudy, wet road conditions while the rest were clear and dry.

Geometrically, this is a skewed intersection that does not have any traffic control other than the railroad crossing gates. The northside of the crossing has an intersection within 200' of the railroad crossing, which is Porter Road.

It is noted that this crossing at Pitt School Road in the unincorporated County may be slated for closure with the planned grade separation from Parkway Blvd in Dixon. This is a planned project in the project development process. Until such time that the planned grade separation is constructed, the Unincorporated County is currently working on Pitt School Road Safety Improvements as an interim solution. The context of adjacent planning and design efforts is considered as part of the project readiness assessment as part of the inventory and prioritization effort.

The following safety measures are proposed for this crossing:

- Install pavement markings per CA MUTCD
- Bulbout/Road diet
- Signalize Porter/Pitt School and Install Pre-signal







Pitt School Road Looking North



Pitt School Road Looking East



Fairfield

Canon Road – Fairfield (DOT 751291P)

The Canon Road grade crossing in Fairfield has experienced two train-related incidents, resulting in a total of 3 injured individuals, along with two near misses as reported by Capitol Corridor. In one incident, a tractor trailer was struck while on the main track. In the other incident, an occupied vehicle with two people was struck as the vehicle drove onto the track as the train was passing. Canon Road is a T-intersection with Vanden Road without pavement markings or sidewalks. This location is in the project development process with safety improvements including short term traffic operations improvements, and longer-term grade separation projects. The following safety measures are recommended:

- Signalization with pre-signal and railroad preemption
- Install pavement markings per CA MUTCD
- Install medians/channelization
- Install streetlights



Canon Road Looking East

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Canon Road Looking West

East Tabor Avenue – Fairfield (DOT 751294K)

The East Tabor Avenue grade crossing is in Fairfield and is at the border of Fairfield and Suisun City. The crossing has had one train-related fatality. The fatality occurred as a vehicle was struck while crossing the railroad tracks. There are nearby driveways and the intersection with Railroad Avenue is approximately 115' away. There are existing medians on both sides of the tracks. There are existing plans in place for various improvements related to safety within the East Tabor Avenue Area by Suisun City to improve traffic flow.

The following safety measures are recommended:

- Install pavement markings and signage per CA MUTCD
- Additional warning signage
- Install traffic signal
- Pedestrian treatments/sidewalks
- Install additional streetlights







East Tabor Avenue Looking East



East Tabor Avenue Looking West



Lopes Road – Fairfield (DOT 751313M)

Lopes Rd in Fairfield is a Tier 1 crossing because of its close proximity to critical activity centers including a school and industrial center.

The following safety improvements are recommended:

- Install medians and channelization devices
- Roadway elements
- Install pavement markings per CA MUTCD



Lopes Road Looking South



Lopes Road Looking South

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Lopes Road Looking North



Lopes Road Looking North

Suisun City

Pedestrian Xing (Solano Rail Hub)-Suisun City (DOT 441093N)

The grade crossing along the Pedestrian Crossing at the Suisun-Fairfield (SUI) Amtrak Station has experienced 1 non-train related incident. No fatality and no injuries were sustained. While there is an existing pedestrian bridge at the station that connects Suisun City to Fairfield, the jurisdiction has highlighted that the existing geometry of

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the crossing does not discourage users from taking advantage of its unprotected nature and crossing the track through gaps within the existing fence system. The shortcut is seen as a bypass to connect Fairfield and Suisun City, and it has a high pedestrian population due to schools and transit riders crossing the tracks to other activity centers. The risk of trespass is high because of the current access challenges and the lack of active warning devices. The existing bridge is also not ADA-compliant in slope and elevation and further north from the station. There is a proposal to upgrade the pedestrian crossing (either through an undercrossing or overcrossing) to improve safety that is currently in the project development process. Until that project is completed, additional safety improvements are recommended.

The safety measures recommended at this intersection include:

- Trespass mitigation
- Install Active Warning Devices
- Install pedestrian improvements



Suisun-Fairfield Amtrak Station Existing Bike and Pedestrian Bridge (from Suisun City, northeast of Station)

Sunset Avenue – Suisun City (DOT 751295S)

The grade crossing at Sunset Avenue in Suisun City has experienced three train-related fatalities, as a result of three separate incidents. In two cases, a pedestrian trespasser walked onto the path of the train and was struck by an oncoming train. In another case, a pedestrian was struck but it is unclear if the pedestrian was trespassing at the time. The nearby cross street, Travis Boulevard, approximately 350' to the north of the railroad crossing, is an access point to I-80. The safety measures recommended at this intersection include:

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- Install pavement markings and signage per CA MUTCD
- Install queue cutter signal subject to queue studies
- Install automatic pedestrian gates with sidewalk realignment





Sunset Ave Looking North



Sunset Ave Looking South





Unincorporated County

Batavia Road – Unincorporated (DOT 751256B)

The grade crossing at Batavia Road in unincorporated County has one train-related fatality. A train struck the occupied vehicle that intentionally drove around lowered/activated gates and waited to be struck at the crossing. This is a skewed intersection with no sidewalks and with driveway access close to the southern leg of the intersection. The safety measures being proposed here are:

- Install medians and channelization
- Install pavement markings per CA MUTCD
- Improved street lighting
- Re-orient railroad arm



Batavia Road Looking North







Batavia Road Looking South

Chadbourne Road – Unincorporated (DOT 751491Y)

The grade crossing at Chadbourne Road in unincorporated County had one incident, resulting in one train-related fatality and one train-related injury. The fatality and injury occurred as the train struck a truck on the tracks. The crossing does not have any curb and gutter, pavement markings, or sidewalks. The following safety measures are recommended:

- Install automatic gates and flashers
- Install pavement markings per CA MUTCD
- Install streetlights







Chadbourne Rd Crossing

Elmira Road – Unincorporated (751259W)

The Elmira Road grade crossing in unincorporated County has one train-related fatality and one train-related injury, resulting from one incident. During this incident, the train collided with a minivan on the track. This is an intersection with California Pacific Road near the western end of the railroad crossing and with A Street on the eastern end of the crossing. The following safety measures are recommended:

- Install pavement markings and signage per CA MUTCD
- Install medians
- Install Queue Cutter with railroad preemption subject to queue studies
- Install streetlights





Elmira Road Looking West



Elmira Road Looking East



Fox Road – Unincorporated (751258P)

The Fox Road grade crossing in unincorporated County has one train-related fatality and injury. The fatality and severe injury occurred within the same incident, during a clear night with no streetlights. The incident was noted to have been under the influence of alcohol or drugs. Geometrically, this is a skewed intersection without sidewalks. The safety measures proposed here are:

- Install medians and channelization
- Install bulbouts
- Install pavement markings per CA MUTCD
- Improved street lighting



Fox Road Looking North







Fox Road Looking South

Fry Rd - Unincorporated (DOT 751289N)

The Fry Rd in Unincorporated County has one train related non-injury, one non-train related injury, and two non-train related non-injury incidents. The incidents are accumulated over 3 separate incidents. The train related non-injury and a non-train related non-injury occurred on the same day and are understood to be recordings of separate understandings of the incident.

The train related incident was due to a truck reportedly illegally crossing the gates while the gate was down, being struck by the train sustaining damage to the rear end, and reportedly fleeing the scene. The non-train related non-injury documents an incident in which a vehicle disobeyed traffic signals and signs on a clear day.

For the other two incidents, both occurred on clear conditions at night with no streetlight. The non-train related injury involved hitting an object during wet conditions.

The non-train related non-injury is associated with property damage due to vehicle improper turning in dry conditions.

The recommended safety improvements are:

- Install pavement markings per CA MUTCD
- Install streetlights
- Install Roadway elements
- Install Bulbouts





Fry Road Looking East



Fry Road Looking West

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Hawkins Rd, Unincorporated County (DOT 751260R)

Hawkins Rd in Unincorporated County is a Tier 1 crossing. It has one train-related injury. The broadside vehicle-train incident occurred during the daytime in the rain. The incident is associated with vehicle driving at an unsafe speed.

The recommended safety improvements are:

- Install pavement markings per CA MUTCD
- Roadway elements (upgrade curb and gutter, etc.)
- Install streetlights



Hawkins Road Looking West







Hawkins Road Looking West

Lewis Road – Unincorporated (DOT 751259W)

Lewis Rd in Vacaville is a Tier 1 crossing because it has one train-related injury. The incident, which resulted in an injury with complaint of pain, occurred during a clear day. The broadside vehicle-train incident is associated with vehicle improper use of traffic signals and signs.

The following safety improvements are recommended:

- Install pavement markings per CA MUTCD
- Install roadway elements
- Install street lighting







Lewis Road Looking North



Lewis Road Looking South

Midway Road – Unincorporated (DOT 751225U)

Midway Road is a skewed intersection in unincorporated Solano County. There is a total of one train-related fatality, one train-related incident, and 8 non-train-related incidents at this intersection. The train-related fatality occurred as a train stuck an occupied vehicle that had driven around a lowered/activated gate. Similarly, the one train-related injury was also the result of a train striking an occupied vehicle. In this case, the occupied vehicle drove onto the crossing and got stuck on the tracks, resulting





in the injury of the one passenger in the occupied vehicle upon being struck by the train. The 8 non-train related incidents were all broadside collisions except one that was a collision with an object. Of the 8, 5 incidents were associated with complaints of pain, 2 with no complaints but with visible injuries, and 1 with severe injury. Automobile right-of-way violations caused 6 incidents; improper turning was the cause of the other 2. Five incidents were recorded during Daylight, 2 occurred in the dark (with and without streetlights), and 1 occurred at dusk-dawn. The weather varied between clear, cloudy, and rainy.

Porter Road ends at the Midway Road intersection at the railroad crossing. Midway Road is an entrance to I-80 to 2.5 miles to the West. The Unincorporated County is looking to plan a grade separation project for this crossing as a long-term priority. Until such time that the planned grade separation is constructed, the following safety measures are recommended for this intersection include:

- Install pavement markings per CA MUTCD
- Improved street lighting
- Re-align eastbound Midway Road to a right-turn movement
- Channelization or median treatment



Midway Road Looking West

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Midway Road Looking West



Midway Road Looking East



Red Top Road – Unincorporated (DOT 751317P)

The Red Top Road grade crossing in unincorporated County has experienced six nontrain related incidents with a total of seven injuries. The non-train related injuries were a mix of object, broadside, and overturned collisions. Two incidents were related to improper turning, one was due to unsafe driving speed, two were associated with automobile right of way, and one was related to driving under the influence of alcohol or drugs. Of the incidents, three incidents were associated with complaints of pain and the other three incident resulted in no complaints but had visible injuries. Two incidents occurred within a construction/repair zone, with one during wet and daytime conditions and the other during dry, day conditions. Of the remaining incidents outside of construction/repair zones, three were under dry conditions and one was during wet conditions.

The Red Top Road grade crossing is considered to receive a grade separation as part of the Phase 2 of the Interstate 80/ 60/ 12 Interchange project. Package 5 of the I-80/I-680/SR 12 Interchange Project will extend Business Center Drive to connect with a realigned Red Top Road. Part of the Red Top Road realignment will include construction of a grade-separated rail crossing. A new interchange will also be constructed at SR 12 and Business Center Drive/Red Top Road.

Red Top Road starts from Lincoln Highway with a 90 degree turn onto the road, with the crossing located around 150' south of the highway. Southbound vehicles have an obstructed view of the railway crossing due to trees on both sides of the road. The safety improvements being recommended are:

- Install pavement markings per CA MUTCD
- Install streetlights
- Tree removals





Red Top Rd Looking North

Rio Dixon Road – Unincorporated (DOT 687614J)

The Rio Dixon Road grade crossing in Unincorporated County has six non-train-related incidents, resulting in a total of eight injuries. The non-train related injuries were a mix of object, broadside, overturned, rear end, and head-on collisions. Two incidents were related to improper turning, three were due to unsafe driving speed, and one was associated with driving under the influence of alcohol or drugs. Of the incidents, three injuries were associated with complaints of pain, two with no complaints but with visible injuries, and one was noted as severe. All incidents occurred during dry conditions, with three during daylight hours and three during nighttime hours under varied lighting conditions.

Rio Dixon Road is a 90-degree crossing with no sidewalks. Roughly 40' south of the crossing, Rio Dixon roadway curves and proceeds east-west, while also maintaining a branch moving north-south. The following safety improvements are recommended for this location:



- Install active warning devices
- Install pavement markings per CA MUTCD
- Install streetlights
- Install curb and gutter



Rio Dixon Road Looking West



Rio Dixon Rd Looking North/West

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Rio Dixon Rd Looking South

Robben Road – Unincorporated (DOT 751247C)

Robben Rd in Unincorporated County is a Tier 1 crossing has one train related noninjury and is in close proximity to critical activity centers, including an industrial center. The train related incident was due to a vehicle crossing the crossing.

The recommended safety improvements are:

- Install medians or channelization devices
- Install street lighting
- Install roadway elements
- Install pavement markings per CA MUTCD







Robben Road Looking North



Robben Road Looking South

Vallejo

Curtola Parkway – Vallejo (DOT 751980J)

Curtola Parkway in the City of Vallejo is a Tier 1 crossing because if its proximity to critical activity centers including schools, senior/community centers, and parks.

The safety improvements being recommended are:

• Install pavement markings per CA MUTCD



- Install streetlights
- Install pedestrian treatments
- Install medians/channelization



Curtola Pkwy Looking West



Curtola Pkwy Looking East



Florida Street – Vallejo (DOT 751472U)

Florida St in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, senior/community centers, parks, and government centers.

The safety improvements being recommended are:

- Install pedestrian devices
- Install streetlighting
- Install bulbouts
- Install pavements marking per CA MUTCD
- Install active warning devices



Florida Street Looking East



Florida Street Looking West

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Georgia Street – Vallejo (DOT 7514774H)

Georgia St in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, senior/community centers, parks, and government centers.

The safety improvements being recommended are:

- Install medians/channelization
- Install pedestrian treatments
- Install pavement markings per CA MUTCD
- Install bulbouts
- Trim vegetation



Georgia Street Looking West







Georgia Street Looking East

Highway 37 – Lewis Brown – Vallejo (DOT 751463V)

Highway 37/Lewis Brown in Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools and parks.

The recommended safety improvements are:

- Install pavement markings per CA MUTCD
- Install medians/channelization
- Install roadway elements
- Vegetation removal/trimming






Lewis Brown Drive Looking East



Lewis Brown Drive Looking West

Louisiana Street – Vallejo (DOT 751470F)

Louisiana St in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools and parks.

- Install medians/channelization
- Install streetlighting
- Install active warning devices
- Install pedestrian treatments
- Vegetation removal







Louisiana Street Looking West



Louisiana Street Looking East





Maine Street – Vallejo (DOT 751475P)

Maine St in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, senior/community centers, parks, and government centers.

The safety improvements being recommended are:

- Install streetlighting
- Install pavement markings per CA MUTCD
- Install roadway elements
- Install pedestrian treatments
- Install bulbouts



Maine Street Looking West







Maine Street Looking East

Mare Island Way – Vallejo (DOT 728451V)

Mare Island Way in Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, parks, and government centers.

The safety improvements being recommended are:

- Install roadway elements
- Install pavement markings per CA MUTCD
- Install pedestrian treatments



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Mare Island Way Looking North



Mare Island Way Looking South

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Mini Drive - Vallejo (DOT 751462N)

Mini Dr in Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools and parks.

The recommended safety improvements are:

- Install pavement markings per CA MUTCD
- Upgrade roadway elements (repave, etc.)
- Install pedestrian gates for four quadrants
- Install traffic signalization with pre-signal and railroad preemption
- Install streetlighting



Mini Drive Looking East







Mini Drive Looking West



Mini Drive Looking West

Mississippi Street – Vallejo (DOT 928448M)

Mississippi St in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, hospitals, and parks.

- Install roadway elements
- Install pavement markings per CA MUTCD
- Install pedestrian treatments
- Install streetlighting
- Install medians/channelization







Mississippi Street Looking West



Mississippi Street Looking East



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Nebraska Street – Vallejo (DOT 751468E)

Nebraska St in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, hospitals, and parks.

The safety improvements being recommended are:

- Install roadway elements
- Install pavement markings per CA MUTCD
- Install pedestrian treatments
- Install medians/road diet



Nebraska Street Looking East

Nebraska Street – Vallejo (DOT 928449U)

Nebraska St in Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools and parks.

- Install pavement markings per CA MUTCD
- Install pedestrian improvements
- Install medians/channelization
- Install streetlighting





Nebraska Street Looking West



Nebraska Street Looking West





Nebraska Street Looking West

Ped Crossing – Vallejo (DOT 751473B)

Ped Xing in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, senior/community centers, parks, and government centers.

- Install active warning devices
- Install pavement markings per CA MUTCD
- Install streetlighting







Aerial View of Ped Crossing

Redwood Street – Vallejo (DOT 928445S)

Redwood St in the City of Vallejo is a Tier 1 crossing because of its proximity to critical activity centers including schools and hospitals.

- Install pavement markings per CA MUTCD
- Repaving of roadway elements
- Install pedestrian treatments
- Install streetlighting
- Restrict driveway access (right in, right out)
- Install medians/channelization







Redwood Street Looking West



Redwood Street Looking East





Redwood St – Vallejo (DOT 751466R)

Redwood St in Unincorporated County is a Tier 1 crossing because of its close proximity to critical activity centers including schools and hospitals.

The recommended safety improvements are:

- Install pedestrian treatments
- Install traffic signal/ queue cutter
- Install active warning devices



Redwood Street Looking East







Redwood Street Looking West

Sereno Dr – Vallejo (DOT 928443D)

Sereno Dr. in the City of Vallejo is a Tier 1 crossing because of its proximity to critical activity centers including schools, hospitals, and parks.

- Install pavement markings per CA MUTCD
- Install streetlights
- Install pedestrian treatments
- Install medians/channelization
- Restrict driveway access
- Landscape removal







Sereno Drive Looking West



Sereno Drive Looking East

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Solano Avenue – Vallejo (DOT 751476W)

Solano Ave in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, senior/community centers, and parks.

The recommended safety improvements are:

- Install roadway elements
- Install streetlighting
- Install pavement markings per CA MUTCD
- Install medians/channelization



Solano Avenue Looking South







Solano Avenue Looking North

Sonoma Blvd/SR 29 – Vallejo (DOT 928447F)

Sonoma Blvd/SR-29 in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, hospitals, and parks.

- Install pavement markings per CA MUTCD
- Install pedestrian treatments
- Install streetlights
- Install medians/channelization







Sonoma Blvd/SR 29 Looking North



Sonoma Blvd/SR 29 Looking South

Tennessee Street – Vallejo (DOT 751469L)

Tennessee St in the City of Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools and parks.

- Install active warning devices/barrier gates
- Install pavement markings per CA MUTCD
- Install roadway elements
- Install pedestrian treatments





Tennessee Street Looking North



Tennessee Street Looking South







Tennessee Street Looking East



Tennessee Street Looking West

Valle Vista Ave/Couch St – Vallejo (DOT 928446Y)

Valle Vista Ave in the City of Vallejo is a Tier 1 crossing because of its proximity to critical activity centers including schools and hospitals.

- Install pavement markings per CA MUTCD
- Install pedestrian gates



- Install roadway elements
- Install streetlights
- Install medians/channelization



Valle Vista Ave/Couch St Looking West







Valle Vista Ave/Couch St Looking East

Valle Vista Ave/Broadway – Vallejo (751467X)

The Valle Vista Ave in Vallejo has one non-train non-injury and is in close proximity to critical activity centers including schools and hospitals.

The recommended safety improvements are:

- Install roadway elements
- Install pavement markings per CA MUTCD Striping
- Install traffic signal (Pre-signal)



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Valle Vista Ave/Broadway Looking West



Valle Vista Ave/Broadway Looking East

Wilson Ave - Vallejo (DOT 928450N)

Wilson Ave in Vallejo is a Tier 1 crossing because of its close proximity to critical activity centers including schools, parks, and government centers.

The safety improvements being recommended are:

• Install pedestrian improvements



- Install pavement markings per CA MUTCD
- Install roadway elements



Wilson Ave Looking North



Wilson Ave Looking South



6.0 COST ESTIMATES

The costs associated with improving rail crossings have been generalized and evaluated for each of the crossings listed in Table 1. The costs assume the local jurisdiction (i.e., roadway authority) would be responsible for the implementation of the improvements.

6.1. Assumptions and Methodology

The magnitude of improvements associated with rail crossing upgrades can vary greatly depending on the level of improvements. For the purposes of this memo, the improvements associated with rail crossing upgrades have been vastly generalized using a few key assumptions drawing from experiences from other railroad improvement plans, the railroad's current set of guidelines and standards, a series of desktop research and use of a range of typical costs for the various improvements identified. These improvements are based on a toolbox approach to addressing safety concerns. They are not based on specific field or site conditions and no survey or traffic studies have been completed for the locations.

Project Controls - With respect to project controls, cost estimates may allocate a percentage of budget to mobilization, traffic control, and time related overhead (usually associated with construction delays, e.g., rain delays). This analysis assumes a lump sum cost for these items as one "Project Controls" item, set to 10% of the construction cost.

Demolition and Removals - Demolitions and removals have been combined into one line item, and are assumed to include the following: concrete flatwork, with an assumed removal of curb or curb and gutter equal to 300 LF; concrete sidewalk pavement removal equal to 1500 SF; asphalt roadway pavement removals equal to 4000 SF; striping removals equal to 1500 LF; relocation of five utility markers; adjusting to finish grade five surface utility structures, like valves and manholes.

Installation of Roadway Elements, Medians, and Gates - Installation of roadway elements is assumed to include curb and gutter as well as asphalt pavement for roadway. Installation of medians is assumed to be representative of two (2), 100' long and 4' wide medians that are constructed with 6" vertical curb and filled with concrete. Installation of UPRR access gates involves providing two maintenance access gates and associated decomposed granite for vehicles; if four gates are to be provided, the quantities were increased from one (1) to two (2).

Installation of Pedestrian Treatments - Installation of full pedestrian treatments is assumed to be representative of one side of the roadway. A sidewalk would not be constructed in one quadrant of a rail crossing but may be constructed on one side of





the roadway through the crossing, and so the unit cost is reflective of two quadrants' worth of costs. This cost is assumed to include two each of the following: CPUC Standard 9-D automatic gate device, emergency egress swing gates, sidewalk approaches from the roadway up to the tracks; detectable warning surface in advance of the crossing. For full pedestrian treatments in all four quadrants, increase the quantity from one (1) to two (2).

Roadway Striping - Roadway striping is assumed to be for a roadway with one travel lane in each direction. For additional travel lanes, increase the quantity appropriately.

Lighting Installation - Installation of lighting is assumed to include two (2) streetlights, associated conduit, and one (1) pull box for each light. For additional lights, increase the quantity appropriately.

Traffic signalization/Preemption - Installation of signal preemption and associated improvements is assumed to include preemption, installation of a new traffic signal (pre-signal or queue cutter), and all associated connections to the railroad warning devices and downstream traffic signal. If this quantity is greater than 1, it will assume full signalization of a second intersection.

Railroad Removal - Railroad removals is assumed to include the removal of all crossing panels and existing two (2) warning devices. Railroad installation of crossing panels is assumed to be on a per-track basis, with an assumed twelve crossing panels per track. Installation of railroad devices assumes installation of two automatic gate arms; if CPUC Standard 9-A devices are provided, this cost would be doubled. Installation of both a signal cabin and Railroad Signal Design Allowance are items that are required by the Railroad authority when significant modifications occur to the crossing.

6.2. Cost Estimate Summary

The cost estimates were prepared based on the following assumptions:

- Initial recommendations
- Ultimate configuration

The initial recommendations encapsulates the costs associated with the base set of recommended safety improvements to mitigate the safety issues that exist at the crossings. These are the items described in this memorandum.

The ultimate configuration adds the costs that would be incurred as part of a larger upgrade to bring the crossing up to the full set of the most recent CPUC and railroad standards which includes the initial recommendations set of safety improvements. For example, automatic gate arms will need to be replaced, upgraded, or modified to meet the recent standards which would require an entirely new set of automatic gates. This set of costs would be considered the full suite of crossing improvements.



Table 12 – Summary of Costs (Rough Order of Magnitud <u>e)</u>								
			Cost					
Crossing location	DOT#	Jurisdiction	Initial Recommendations	Ultimate Configuration				
Park Road	751527E	Benicia	\$2,500,000	\$5,000,000				
Industrial Way	751550Y	Benicia	\$2,600,000	\$3,500,000				
1st Street	751250K	Dixon	\$2,200,000	\$4,700,000				
Canon Road	751291P	Fairfield	\$2,400,000	\$5,900,000				
East Tabor Avenue	751294K	Fairfield	\$2,100,000	\$4,300,000				
Lopes Road	751313M	Fairfield	\$1,300,000	\$4,300,000				
Sunset Avenue	7512955	Suisun City	\$3,600,000	\$5,700,000				
Pedestrian Xing (Solano Rail Hub)	441093N	Suisun City	\$2,000,000	\$3,800,000				
Rio Dixon Road	687614J	Unincorporated	\$2,700,000	\$3,500,000				
Robben Road	751247C	Unincorporated	\$1,500,000	\$3,500,000				
Pitt School Road	751254M	Unincorporated	\$1,600,000	\$5,200,000				
Midway Road	751255U	Unincorporated	\$3,100,000	\$5,700,000				
Batavia Road	751256B	Unincorporated	\$1,600,000	\$4,100,000				
Fox Road	751258P	Unincorporated	\$1,500,000	\$4,100,000				
Lewis Road	751259W	Unincorporated	\$1,200,000	\$3,700,000				
Hawkins Road	751260R	Unincorporated	\$1,200,000	\$3,800,000				
Elmira Road	751288G	Unincorporated	\$2,020,000	\$4,900,000				
Fry Road	751289N	Unincorporated	\$1,500,000	\$4,100,000				
Red Top Road	751317P	Unincorporated	\$1,500,000	\$3,400,000				
Chadbourn Road	751491Y	Unincorporated	\$1,900,000	\$3,600,000				
Mini Drive	751462N	Vallejo	\$3,400,000	\$5,700,000				
Hwy 37 / Lewis Brown Dr	751463V	Vallejo	\$1,300,000	\$3,800,000				
Redwood Street	751466R	Vallejo	\$4,000,000	\$6,000,000				
Valle Vista Avenue	751467X	Vallejo	\$2,000,000	\$4,000,000				
Nebraska	751468E	Vallejo	\$2,500,000	\$5,000,000				



Table 12 – Summary of Costs (Rough Order of Magnitude)								
			Cost					
Crossing location	DOT#	Jurisdiction	Initial	Ultimate				
			Recommendations	Configuration				
Tennessee Street	751469L	Vallejo	\$4,100,000	\$5,900,000				
Louisiana Street	751470F	Vallejo	\$3,200,000	\$5,200,000				
Florida Street	751472U	Vallejo	\$3,200,000	\$5,200,000				
Ped Xing	751473B	Vallejo	\$2,700,000	\$3,400,000				
Georgia Street	751474H	Vallejo	\$2,800,000	\$4,800,000				
Maine Street	751475P	Vallejo	\$2,700,000	\$5,000,000				
Solano Avenue	751476W	Vallejo	\$1,300,000	\$3,800,000				
Curtola Parkway	751980J	Vallejo	\$1,900,000	\$5,400,000				
Sereno Drive	928443D	Vallejo	\$2,700,000	\$5,200,000				
Redwood Street	928445S	Vallejo	\$2,700,000	\$5,200,000				
Valle Vista Avenue	928446Y	Vallejo	\$2,700,000	\$4,700,000				
Sonoma Blvd (SR 29)	928447F	Vallejo	\$2,700,000	\$6,200,000				
Mississippi Street	928448M	Vallejo	\$2,700,000	\$5,700,000				
Nebraska Street	928449U	Vallejo	\$2,700,000	\$4,700,000				
Wilson Avenue	928450N	Vallejo	\$2,900,000	\$4,900,000				
Mare Island Way	928451V	Vallejo	\$1,600,000	\$5,900,000				



7.0 **PRIORITIZATION**

The grade crossings were prioritized according to the Rail Crossing Safety Study Methodology Memorandum. The methodology for prioritization ranks safety as a primary category, with proximity to activity centers and traffic and train volumes as secondary categories to safety. Higher costs were ranked lower than lower cost crossing improvements.

Table 13 identifies the prioritization of the Tier 1 crossings. The crossings are categorized in groups because of logical patterns in the data and using engineering judgement about the relative safety concerns at the crossings. For example, higher traffic volume locations with higher frequency and higher speed trains may be considered a larger safety concern than a location with lower speed trains with lower traffic volumes. Project readiness was added as an additional criteria because of the momentum of the project development process and the recognition from the stakeholders of the importance of the safety concerns at those locations.





Table 13 – Tier 1 Railroad Crossing Prioritization Matrix									
Ranking	Location	Incidents	Proximity to Key Facilities	Traffic Volumes	Train Speed and Volumes	Capital Costs	Project Readiness		
1 - 7	East Tabor Ave (Fairfield), 1st St (Dixon), Pitt School Rd (Uninc), Sunset Ave (Suisun City), Canon Rd (Fairfield), Pedestrian Xing (Solano Rail Hub) (Suisun City), Midway (Uninc)		L		L	L			
8-12	Elmira Rd (Uninc), Industrial Way (Benicia), Batavia Rd(Uninc), Fox Rd (Uninc), Fox Rd (Uninc)				L	L	L		
13-19	Chadbourne Rd (Uninc), Rio Dixon Rd (Uninc), Red Top Rd (Uninc) Fry Rd (Uninc), Robben Rd (Uninc), Hawkins Rd (Uninc), Lewis Rd (Uninc)								
20-30	Valle Vista Avenue (Vallejo), Ped Xing (Vallejo), Valle Vista Avenue (Vallejo), Nebraska (Vallejo), Florida Street (Vallejo), Georgia Street (Vallejo), Maine Street (Vallejo), Sereno Drive (Vallejo), Redwood Street(Vallejo), Lopes Road (Fairfield), Hwy 37 / Lewis Brown Dr (Vallejo)					L			
31+	Solano Avenue (Vallejo), Nebraska Street (Vallejo), Louisiana Street (Vallejo), Wilson Avenue (Vallejo), Mini Drive (Vallejo), Tennessee Street (Vallejo), Curtola Parkway (Vallejo), Mississippi Street (Vallejo), Mare Island Way (Vallejo), Sonoma Blvd (SR 29) (Vallejo)		L						



8.0 FEDERAL FUNDING PROGRAMS

This section addresses potential funding sources for the railroad-related projects. This includes federal and state funding sources. The amount of funding available and timing of funding opportunities is constantly changing, but the links to the programs are provided for more updated information.

8.1. Railway Highway Grade Crossings (Section 130) Program

Administering Agency: California Public Utilities Commission (CPUC) and Caltrans

The purpose of the Section 130¹ funding program is to reduce the number and severity of highway accidents and enhance safety for vehicles, bicycles, and pedestrians at current at-grade crossings. Section 130 program provides federal funds authorized by Title 23, United States Code, Section 130 (23 U.S.C 130) to local agencies and railroads administered by California Department of Transportation (Caltrans). The at-grade crossing improvement projects include the installation of railroad protection systems such as traffic signals, guardrails, pedestrian/bicycle path improvements, active warning equipment installation/upgrades, roadway geometry improvements and grade crossing elimination.

Section 130 funded projects are 90% federally funded with a 10% local match contribution. Caltrans will fund the local match requirement through the Surface Transportation Program (STP). California generally is allotted approximately \$17 million per year through the Infrastructure Investment and Jobs Act (IIJA). Due to limited funding, project selection is determined by the California Public Utilities Commission (CPUC) in collaboration with Caltrans.

The CPUC develops a priority list annually based on the scope of work needed to eliminate hazards at existing at-crossing sites according to available data and current conditions. Once the highest ranked crossings are identified, the local agencies and railroads of those crossings must collaborate with CPUC and Caltrans to conduct field diagnostic reviews and ensure the project is in alignment with the funding criteria to qualify for this program. Projects must be included in the Federal Statewide Transportation Improvement Program (FSTIP) and approved by the Federal Highway administration (FHWA) to be considered. The criteria to qualify for Section 130 funding considers accident history, vehicle and train volumes, pedestrian issues, and geometry. Once potential locations have been identified, a site visit with all representatives and staff will be conducted in order to provide an in-depth analysis of the existing conditions.

CPUC finalizes the priority list in the August of each year and provides the list to Caltrans RHCP manager to proceed with the contract award process.

¹ <u>https://highways.dot.gov/safety/hsip/xings/railway-highway-crossing-program-overview</u>



8.2. Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program

Administering Agency: Federal Railroad Administration (FRA) and the United States Department of Transportation (USDOT)

The CRISI² program invests in various railroad projects that improve safety, efficiency, and reliability. Projects that enhance good movements, multi-modal connections and improve or create new Intercity Passenger Rail Transportation corridors are considered for funding. The following improvements are eligible for funding; deployment of railroad safety technology, highway-rail grade crossing safety improvement projects as well as the development and implementation of safety programs are eligible for funding. Safety improvements such as railroad gates and crossing signals in the proposed grade crossing improvements will qualify for funding under this grant. This grant is administered by the Federal Railroad Administration (FRA) and the United States Department of Transportation (USDOT).

This grant contains multiple application tracks that cover activities ranging from rail planning, preliminary engineering, plans, specifications, and estimate (PS&E) development and construction. There is no limit to the number of tracks that can be included under one application. The application package will include project narrative, scope of work, benefit-cost analysis (BCA), environmental compliance documentation, and standard federal forms.

Based on the FRA selection criteria, preference is given to projects that request less than 50% of funding, create maximum benefit of grant funds based on the BCA, and develop and implement measures that reduce trespassing and injuries and fatalities in the top 25 counties with the most pedestrian casualties and follow FRA's Community Trespassing Prevention Program. Based on these requirements, the level of match that STA has available will determine the competitiveness of the application.

The minimum match requirement is 20% with a maximum federal cost share of 80%. The match funding can include state, local or private sector funds. The total available funding in Fiscal Year (FY) 22 was \$1.4 billion with no predetermined amounts for minimum or maximum awards.

8.3. Nationally Significant Multimodal Freight & Highway Projects Program (INFRA) Administering Agency: USDOT

² <u>https://railroads.dot.gov/grants-loans/competitive-discretionary-grant-programs/consolidated-rail-infrastructure-and-safety-2</u>



The INFRA³ program is a competitive grant intended for projects that provide national or regional significance administered by USDOT. This grant supports improvement projects that focus on safety, efficiency, and reliability of transportation infrastructure such as freight and additional modes in both rural and urban areas. Eligible projects include highway-railway grade crossing projects and freight rail projects that provide public benefit. The proposed grade crossing improvements can be combined with multimodal projects within the selected project locations to create a competitive funding request.

The application package consists of a project description, project location in Excel, project budget, funding commitment documentation, merit criteria, project readiness, BCA narrative and calculations, and standard federal forms.

The federal share for this grant is up to 80% with a 20% non-federal match. The IIJA has made \$8 billion available to INFRA for FY 22 through FY 26. \$3.1 billion was allocated for the FY 23-24 INFRA grant. Award sizes were estimated to be up to \$50 million.

USDOT streamlined the process and combined the application for the Mega, INFRA, and Rural programs into one Multimodal Project Discretionary Grant Opportunity (MPDG). The selection criteria for this program includes the following categories:

- Safety
- State of good repair
- Economic impacts, freight movement and job creation
- Climate change, resilience, and the environment
- Equity, multimodal options, and quality of life

8.4. Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant

Administering Agency: USDOT

The RAISE⁴ program provides funding for surface infrastructure projects such as road, rail, transit, and port that enhance safety, increase environmental sustainability, improve quality of life, mobility, and community connectivity that have a significant impact locally or regionally. This is a competitive funding opportunity that all public entities are eligible for. It is funded through IIJA and administered by the USDOT. Eligible project types include capital improvements to passenger and freight rail transportation. The proposed safety improvements can be included in this funding request as this grant is intended for projects that face challenges acquiring funding through traditional DOT discretionary grants.

Applicants must submit a package which includes: a project information form using a provided Excel template; project description; project location file, either in a Shapefile,

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⁴ https://www.transportation.gov/RAISEgrants



³ <u>https://www.transportation.gov/grants/infra-grant-program</u>

KML/KMZ, or GEOJSON; project budget, sources, and uses of funding; funding commitment documentation; outcome criteria narrative; project readiness; project requirements; BCA narrative and calculations. Applicants also have the option to submit letters of support, a community benefits plan, and/or a Title VI plan.

The funding available in FY 23 was about \$1.5 billion with an awards size between \$1 million to \$25 million and typically requires a 20% local match and 80% federal share. A merit-criteria are used to select projects that provide extraordinary benefits and provide highly needed infrastructure.

USDOT is anticipated to publish the next RAISE NOFO in Winter 2024. STA is competitive for this program, but it is highly competitive within the nation.

8.5. Railroad Crossing Elimination Grant Program

Administering Agency: Federal Railroad Administration (FRA)

The focus of this program is to fund highway-rail or pathway-rail crossing improvement projects that enhance safety and mobility for goods and people. The projects that are eligible for funding include improvement or installation of protective devices, signals, signs, or additional ways to improve safety of goods and pedestrian mobility at at-grade crossing. This includes planning, environmental review, and the design of the proposed elements.

Eligible recipients include states, a unit of local government or group of local governments, metropolitan planning organizations and public port authorities. This grant supports grade separations, closing crossings, and corridor-wide grade crossing improvements that significantly improve safety along the rail network. The proposed safety improvements can be combined in the funding request as a corridor-wide improvement to a region that faces multiple safety hazards. The selection criteria for this program includes an evaluation of the project benefits, technical merit, and selection criteria. The selection criteria include the following categories:

- Safety
- Equitable economic strength and improving core assets
- Equity and barriers to opportunity
- Climate change and sustainability
- Transformation of our nation's transportation infrastructure (state of good repair)
- Eliminating crossings and making corridor-wide improvements
- Geographic diversity

This grant is distributed by the Federal Railroad Administration (FRA). Based on the FY22 NOFO, the total funding available was \$573 million. FRA award minimum award is \$1 million while there is not a predetermined maximum. The maximum federal cost share is 80% of the project cost and the minimum match requirement is 20%. STA is not

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as competitive for this opportunity because California has relatively lower rate of incidents as compared to the nation.

The FRA's target publication period for the FY 23 Railroad Crossing Elimination program NOFO is September/October 2023. Requirements and eligibility may vary once the FY 23 NOFO is released⁵.

9.0 STATE FUNDING PROGRAMS

9.1. Senate Bill 1 (SB 1)

The SB 1 or <u>Road Repair and Accountability Act of 2017</u> funds an estimated \$5 billion annually to invest in the repair of roads, freeways and bridges in California. SB 1 allocated an estimated \$7.7 billion for rail and transit investment over the next 10 years. This bill funds programs that focus on specific challenges the state infrastructure may face. The following programs within SB 1 can serve as potential funding sources for safety improvements at various at-grade crossing locations.

9.2. State Rail Assistance (SRA) Program

Administering Agency: California State Transportation Agency (CalSTA)

The SRA ⁶program funds operation and capital railroad improvements that provide benefit to the public funded by Senate Bill 1. Capital improvements include track and station investments that reduce travel time, delays, improve accessibility and enhance traveler experience. The proposed safety improvements can be included into additional capital or operation investments. Commuter rails that increase safety can attract new riders and increase overall long-term ridership.

CalSTA distribute the funds. Eligible recipients are public agencies, including joint power agencies that are responsible for state-supported intercity or commuter rail services. Funding is distributed between commuter and intercity rail agencies. Funds for intercity rail are flexible and able to give awards to existing or aspiring corridors and Caltrans.

CalSTA offers funding requests to projects that provide enhanced connectivity and increase rail ridership. An Allocation Request form is used to determine if the project meets all the requirements. Funding is elevated through a statutory formula and stakeholder engagement is encouraged. This grant is specific to commuter and intercity rail that was allocated about \$454 million from the SB 1 program. For the safety improvements to be most competitive, additional rail improvements would need to be

⁶ <u>https://calsta.ca.gov/subject-areas/state-rail-assistance</u>



⁵ <u>https://railroads.dot.gov/grants-loans/competitive-discretionary-grant-programs/railroad-crossing-elimination-grant-program</u>
bundled and Capitol Corridor Joint Powers Authority (CCJPA) would need to be the applicant.

9.3. Trade Corridor Enhancement Program (TCEP)

Administering Agency: California Transportation Commission

The purpose of the TCEP7 is to fund infrastructure improvements on federally designated Trade Corridors of National and Regional Significance and on the National Highway System. This includes freight rail system improvements. TCEP considers freight system factors, transportation factors (such as safety, congestion reduction/mitigation), community factors and overall benefits and cost of the project. The proposed safety improvements can be bundled with projects that address the additional factors evaluated in the criteria.

This program requires a match of 30% from either private, local, federal or state funds. Projects nominated by Caltrans do not require a match. Projects nominated by regions are required to have a match. STA is competitive for this fund source.

This competitive state grant has an estimated \$300 million per year available for funding that was allocated by SB 1 and an additional \$515 million in National Highway Freight Program funds. Public entities are eligible to apply, but need the support of railroad partners. Funds may be used for plans, specifications, and estimates, right-ofway, and construction phases.

9.4. State Transportation Improvement Program (STIP)

STIP⁸ projects are included in a five-year investment plan and updated every two years. These projects are funded by state excise tax on gasoline. Capital improvement projects are eligible to receive funding. STIP consist of the Regional Transportation Improvement Program (RTIP) and the Interregional Transportation Improvement Program (ITIP).

10.0 REGIONAL FUNDING PROGRAMS

The Metropolitan Transportation Commission (MTC) comprises nine Bay Area counties including Solano County. MTC offers the following sources of funding. Transit agencies can apply these funds to capital improvement projects or operations.

10.1. Transportation Development Act (TDA)

The TDA program funds state transit projects ranging from transit operations to transportation planning. The funds for this program are generated from two major funding sources: the Local Transportation Fund (LTF) and the State Transit Assistance (STA) fund. These funds can be requested through MTC through an application workbook⁹. Fund requests are evaluated each month except for August and take

⁹ https://mtc.ca.gov/funding/regional-funding/tda-sta/allocation-requests-audits



⁷ <u>https://catc.ca.gov/programs/sb1/trade-corridor-enhancement-program</u>

⁸ https://mtc.ca.gov/funding/state-funding/state-transportation-improvement-program-stip

approximately 2.5 months to process. Proposed safety improvements that benefit bicycle and pedestrian users should seek funding from the Transportation Development Act Article 3 (TDA 3)¹⁰ fund.

10.2. State Transit Assistance (STA) Fund

The STA¹¹ funds are secured through sales tax on fuel and diesel fuel and are source of funding for the TDA. The availability of this fund source is dependent on the yearly cost of fuel. This fund source is divided into two parts population-based funds and revenue-funds which are used methods used to distribute funding to eligible agencies.

10.3. Local Transportation Fund (LTF)

This funding source¹² obtains funding from ¼ cent of the general sales tax collected throughout the state. Funding is available in each county for administration, planning and programing, pedestrian and bicycle projects and passenger rail projects.

11.0 LOCAL FUNDING PROGRAMS

11.1. Regional Traffic Impact Fee (RTIF)¹³

This fee is applied to approved development projects that will have an impact on the cost of public transportation infrastructure. These fees are used to fund transportation projects within multiple counties throughout region. The Solano County's Public Facility Fee (PFF) includes a \$1,500 per dwelling unit equivalent that is allocated within Solano County, STA administration, and regional transit improvements.

Appendix E provides a summary of the grant opportunities including funding source, available funds, minimum/maximum awards, match requirements and special considerations/requirements.

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¹³ <u>https://sta.ca.gov/operations/funding/local/</u>



¹⁰ <u>https://mtc.ca.gov/funding/regional-funding/tda-sta/bicycle-pedestrian-funds-tda-3</u>

¹¹ <u>https://mtc.ca.gov/funding/regional-funding/transportation-development-act-tda-state-transit-assistance-sta</u>

¹² <u>https://dot.ca.gov/-/media/dot-media/programs/rail-mass-transportation/documents/f0009844-tda-07-</u> 2018-a11y.pdf

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APPENDIX A – RAILROAD CROSSING INVENTORY

















APPENDIX B- RAILROAD CROSSING INCIDENT INVENTORY





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					Incidents							
Updated	I: 07/11/2023					Tr	ain			Non-Train		
No.	DOT No.	Roadway Name	City or Town	Private	Fatality	Injury	Non-Injury	Near-Miss	Fatality	Injury	Non-Injury	
44	751306C	Private Road	Fairfield	Х							i	
45	751307J	Thomasson	Fairfield	Х							1	
46	751309X	Private Road	Fairfield	Х							l	
47	751310S	Private Road	Fairfield	Х							i	
48	751311Y	Bridgeport Avenue	Unincorporated							1	l	
49	751313M	Lopes Road	Fairfield								3	
50	751314U	Cordelia Road Spur	Fairfield								l	
51	751315B	Cordelia Road	Unincorporated								1	
52	751317P	Red Top Road	Unincorporated							6	6	
53	751319D	Private Road	Unincorporated	Х							1	
54	751462N	Mini Drive	Vallejo								1	
55	751463V	Hwy 37 / Lewis Brown Dr	Vallejo									
56	751464C	Tuolumne	Vallejo								1	
57	751 4 65J	Sereno Drive	Vallejo								l	
58	751466R	Redwood Street	Vallejo								1	
59	751467X	Valle Vista Avenue	Vallejo								1	
60	751468E	Nebraska	Vallejo									
61	751469L	Tennessee Street	Vallejo								1	
62	751470F	Louisiana Street	Vallejo								1	
63	751472U	Florida Street	Vallejo									
64	751473B	Ped Xing	Vallejo								l	
65	751474H	Georgia Street	Vallejo								l	
66	751475P	Maine Street	Vallejo								1	
67	751476W	Solano Avenue	Vallejo								l	
68	751478K	5th Street	Vallejo								l	
69	751479S	Sonoma Boulevard	Vallejo								l	
70	751481T	Chestnut Street	Vallejo								l	
71	751488R	Private Duck Club	Unincorporated	Х							ļ	
72	751489X	Jacksnipe Road	Unincorporated	Х							l	
73	751490S	Private Duck Club	Unincorporated	Х							ļ	
74	751491Y	Chadborn Road	Unincorporated	Х	1	1					l	
75	751493M	Private Industry	Unincorporated	Х	1						l	
76	751494U	Pierce Lane	Unincorporated								ļ	
77	751495B	Morrow Lane	Unincorporated	Х							l	
78	751498W	Lake Herman Road	Benicia							1	ļ	
79	751499D	Lake Herman Road	Benicia	Х							1	
80	751501C	Private Industry - Verizon	Benicia	X								
81	751505E	Private	Benicia	X			1				l	
82	751506L	Private	Benicia	Х								
83	751516S	Bayshore Road	Benicia								ł	
84	751517Y	Jackson Street	Benicia									
85	751518F	All Private in Yard - Valero	Benicia	X		1						
86	751519M	Private	Benicia	X							ł	
87	751523C	Private	Benicia	X								
88	751524J	Private	Benicia	X								
89	751525R	Private Industry Ironworkers	Benicia	Х						1	ł	
90	751527E	Park Road	Benicia				1					
91	751529T	City Street	Benicia	X							ł	
92	751534P	Private Exxon	Benicia	X								
93	/5153/K	Private Industry - Shell Oil	Benicia	X							l	
94	751538S	Private Industry - Shell Oil	Benicia	Х								
95	/51545C	Bayshore Road	Benicia								l	
96	/51546J	Industrial Way	Benicia								ł	
97	751547R	Oregon Street	Benicia								I	

					Inci				Incidents			
Updated	1: 07/11/2023					Tr	rain			Non-Train		
No.	DOT No.	Roadway Name	City or Town	Private	Fatality	Injury	Non-Injury	Near-Miss	Fatality	Injury	Non-Injury	
98	751548X	Park Road	Benicia							2	1	
99	751550Y	Industrial Way	Benicia			1	2					
100	751556P	East Channel Road	Benicia									
101	751558D	Park Road	Benicia							1	1	
102	751559K	Park Road	Benicia									
103	751560E	Nevada Street	Benicia									
104	751561L	Iowa Street	Benicia									
105	751562T	Stone Way	Benicia									
106	751565N	Bayshore Road	Benicia									
107	751980J	Curtola Parkway	Vallejo									
108	753750P	Private Industry - Hadley	Benicia	Х								
109	928442W	Broadway Avenue	Vallejo									
110	928443D	Sereno Drive	Vallejo									
111	928445S	Redwood Street	Vallejo									
112	928446Y	Valle Vista Avenue	Vallejo									
113	928447F	Sonoma Blvd (SR 29)	Vallejo									
114	928448M	Mississippi Street	Vallejo									
115	928449U	Nebraska Street	Vallejo									
116	928450N	Wilson Avenue	Vallejo									
117	928451V	Mare Island Way	Vallejo									
118	932169Y	Private	Fairfield	Х								
119	932170T	Private	Fairfield	X								
120	968046P	Private	Unincorporated	Х								
121	968047W	Private	Unincorporated	x								
			Π									
122	968048D	Private	Unincorporated	Х			2	3				
123	968050E	Private	Unincorporated	х								
	CCCOOL		pordiou				1			1		
124	968052T	Birds Landing Road	Unincorporated									
125	968053A	Private	Unincorporated	Х								
							1					
126	968054G	Private	Unincorporated	Х								
127	968055N	Private	Unincorporated	Х								
128	968056V	Western Railway Museum	Unincorporated	Х								
129	968057C	Private	Unincorporated	Х								
130	969804T	Private	Fairfield	Х								
131	969805A	Private Road	Fairfield	Х								
132	969806G	Private Road	Fairfield	X								
133	TBD	Pedestrian Waterfront Access	Benicia	X								
134	TBD	Private (S/O Tyler and Bayshore)	Benicia	X								
135	TBD	Refinery Access Road	Benicia									
136	TBD	Mare Island Causeway	Vallejo									
137	TBD	Nimitz Avenue	Vallejo									
138	TBD - Private Exxon	Private Exxon	Benicia	Х						1		
		TOTALS			12	11	19	6	0	35	50	

Black text = Listed in FRA and CPUC databases

Blue text = Listed in FRA database

Green text = Listed in CPUC database

				Key Facilities										
Updated	: 07/11/2023				Sc	hool	Senior / Com	munity Center	Transit Center	Ind. Center	Large Empl. Area	Hospital	Park	Gov. Center
No.	DOT No.	Roadway Name	City or Town	Private	1/4 Mile	1/2 Mile	1/4 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile
1	440675P	Huntington Drive	Fairfield							x				
									х	х			x	
2	441093N	Pedestrian	Unincorporated											
3	450529L	Industrial Court	Benicia							х				
4	687605K	Gate Road	Fairfield											
5	687608F	Meridian Road	Unincorporated											
	0070444													
6	687614J	Rio Dixon Road	Unincorporated											
_	0070450	Olate Davida 440	the first second second second											
/	0070 ISR	State Route 113	Unincorporated											
0	697616V	Cook Lana	Unincorporated											
0	007010	COOK Laite	Unincorporated											
0	687610T	Creed Road	Unincorporated											
3	00/0101	Greed Hoad	onneorporated											
10	687622B	Lambie Road	Unincorporated											
10	0010220	Lambie Hous	onnioorporatoa											
11	687626D	Little Honker Bay Road	Fairfield											
12	687632G	Shiloh Road	Unincorporated											
13	687634V	Dinkel Spiel Road	Fairfield											
14	751241L	Old Davis Road	Unincorporated											
15	751242T	Private	Unincorporated	Х										
16	751244G	Private	Unincorporated	Х										
17	751245N	Private	Unincorporated	Х										
18	751246V	Tremont Road	Unincorporated											
19	751247C	Robben Road	Unincorporated							х				
20	751248J	Pedrick Road	Dixon							х				
21	751249R	Vaughn Road	Dixon							x				
22	751250K	1st Street	Dixon							х			x	
23	751253F	West A Street	Dixon							х				х
24	751254M	Pitt School Road	Dixon										x	
25	7512550	Midway Road	Unincorporated											
26	751256B	Batavia Road	Unincorporated											
27	751257H	Weber Road	Unincorporated		-									
20	751250F	FOX Road	Unincorporated											
29	751239W	Lewis Road	Unincorporated											
30	751200R	Elmira Road	Unincorporated											
31	751280N	Ennia Road	Unincorporated		<u> </u>					+				
32	751203N	Canon Road	Fairfield	ł	<u> </u>	ł	ł	ł	+	<u> </u>				
34	751294K	Fast Tabor Avenue	Fairfield		1	×			Y	1				
35	7512958	Sunset Avenue	Suisun City		1	<u> </u>	1	1	Ŷ				Y	
36	751298M	Cordelia Road	Suisun City			1	1	1	x				x	
37	751299U	Cordelia Road	Suisun Citv	1	ł	1	1	1		1			x	
38	751300L	Pennsylvania Avenue	Suisun City											
39	751301T	Beck Avenue	Fairfield		İ				x	x	İ			
40	751302A	Cordelia Road	Fairfield		1					x				
41	751303G	Chadbourne Road	Fairfield		1					x				
42	751304N	Private Road	Fairfield	Х	1					×	1			
43	751305V	Cordelia Road	Fairfield							х				
44	751306C	Private Road	Fairfield	Х						Х				
45	751307J	Thomasson	Fairfield	X										
46	751309X	Private Road	Fairfield	X										
47	751310S	Private Road	Fairfield	X										
48	751311Y	Bridgeport Avenue	Unincorporated											
49	751313M	Lopes Road	Fairfield			X			x	x				
50	751314U	Cordelia Road Spur	Fairfield						x	x				
51	751315B	Cordelia Road	Unincorporated							x				
52	751317P	Red Top Road	Unincorporated							х				
53	751319D	Private Road	Unincorporated	X	ļ	L	L	L	1	ļ				
54	751462N	Mini Drive	Vallejo			×			x					
55	751463V	Hwy 37 / Lewis Brown Dr	Vallejo			×			x	х				
56	751464C	Tuolumne	Vallejo	1	1	1	1	1	x	x	1		1	

				Key Facilities										
Updated	: 07/11/2023				Sc	100	Senior / Com	munity Center	Transit Center	Ind. Center	Large Empl. Area	Hospital	Park	Gov. Center
No	DOT No.	Roadway Name	City or Town	Private	1/4 Mile	1/2 Mile	1/4 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile
57	751465.1	Sereno Drive	Valleio						Y	Y		Y		
50	751/66P	Bedwood Street	Vallejo		v	v			×	^		^		
50	7514001		Vallejo		^	~			^					
59	751407A	Valle Vista Averiue	Vallejo		X	X			X			X		
60	751468E	Nebraska	vallejo		X	X				x				
61	751469L	Tennessee Street	Vallejo			X			х	х				
62	751470F	Louisiana Street	Vallejo			X		X	х	х			х	
63	751472U	Florida Street	Vallejo			x	X	X	х	х			х	
64	751473B	Ped Xing	Vallejo			X	X	X	х	х			х	
65	751474H	Georgia Street	Vallejo			x	x	x	x	x			x	
66	751475P	Maine Street	Valleio			x	x	x	x	x			x	
67	751476W	Solano Avenue	Valleio			×	~	×	×	×			x	
60	7514791	5th Street	Vallejo			^		^	^	~			~ ~	
00	751476K	Sui Street	Vallejo							X			X	
69	7514795	Sonoma Boulevard	vallejo							x			X	
70	751481T	Chestnut Street	Vallejo						х	х				
71	751488R	Private Duck Club	Unincorporated	Х										
72	751489X	Jacksnipe Road	Unincorporated	Х										
73	751490S	Private Duck Club	Unincorporated	Х										
74	751491Y	Chadborn Road	Unincorporated	Х										
75	751493M	Private Industry	Unincorporated	х										
76	75149411	Pierce Lane	Unincorporated										v	
77	751/05R	Morrow Lane	Unincorporated	x				<u> </u>	1	1			^	
70	751400\//		Popioio	^										
/8	701498VV		Denicia				1	ł	+	X			X	
79	751499D	Lake Herman Road	Benicia	X						X			x	
80	751501C	Private Industry - Verizon	Benicia	X						x				
81	751505E	Private	Benicia	Х										
82	751506L	Private	Benicia	Х										
83	751516S	Bayshore Road	Benicia							x				
84	751517Y	Jackson Street	Benicia							x				
85	751518F	All Private in Yard - Valero	Benicia	х						x				
86	751519M	Private	Benicia	X						×				
00	7515220	Private	Bonicia	×						<u>^</u>				
0/	7515230	Private	Denicia	×						*			*	
88	751524J	Private	Benicia	×						x			X	
89	751525R	Private industry ironworkers	Benicia	X						X				
90	751527E	Park Road	Benicia							x				
91	751529T	City Street	Benicia	Х						x				
92	751534P	Private Exxon	Benicia	Х						х				
93	751537K	Private Industry - Shell Oil	Benicia	Х						х				
94	7515385	Private Industry - Shell Oil	Benicia	Х						x				
95	7515450	Bayshore Road	Benicia	~					v	×				
06	7515461	adustria Way	Benicia						×	×				
90	7515405	Oregon Street	Denicia						^	*				
97	751547R	Olegon Street	Denicia							X				
98	751548X	Park Road	Benicia							X				
99	751550Y	Industrial Way	Benicia					L		х				
100	751556P	East Channel Road	Benicia							×				
101	751558D	Park Road	Benicia						x	x				
102	751559K	Park Road	Benicia							х				
103	751560E	Nevada Street	Benicia							x				
104	751561L	owa Street	Benicia					1		x				
105	751562T	Stone Way	Benicia						1	Y Y				
106	751565N	Bayshore Road	Benicia						1	×			×	
107	7510801	Curtola Parkway	Valleio		1	~	1	~	~	~			~	ł
107	7527500	Privato Industry Lights	Ponisia	~		×		X	X	×			×	
108	753750P	Private moustry - Hadley	Denicia	^	1		1	ł	+	×			x	
109	928442W	Broadway Avenue	vallejo						x	X				
110	928443D	Sereno Drive	Vallejo		x		l		x	x				
111	928445S	Redwood Street	Vallejo		X	X			х	х				
112	928446Y	Valle Vista Avenue	Vallejo		x	x			x	x				
113	928447F	Sonoma Blvd (SR 29)	Vallejo			X				x				
114	928448M	Mississippi Street	Valleio		İ	x	İ	İ	x	x	1		l	
115	92844911	Nebraska Street	Valleio			v		1	v	, ^				
140	020450N				1	<u></u>	1	<u> </u>	<u>,</u>				~	ł
116	92043UN	Wilson Avenue	vallejo		1	×	1	ł	x	×			x	
117	928451V	Mare Island Way	Vallejo			X		L	Х	Х			Х	
118	932169Y	Private	Fairfield	X						X				
119	932170T	Private	Fairfield	X					x	x				
120	968046P	Private	Unincorporated	Х										
121	968047W	Private	Unincorporated	х	i i		İ	İ		İ	1		l	
<u> </u>					1		1	1	1	1				
122	968048D	Private	Unincorporated	х				1						

					Key Facilities									
Update	d: 07/11/2023				Sc	hool	Senior / Com	munity Center	Transit Center	Ind. Center	Large Empl. Area	Hospital	Park	Gov. Center
No.	DOT No.	Roadway Name	City or Town	Private	1/4 Mile	1/2 Mile	1/4 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile	1/2 Mile
123	968050E	Private	Unincorporated	Х										
124	968052T	Birds Landing Road	Unincorporated											
125	968053A	Private	Unincorporated	x										
126	968054G	Private	Unincorporated	x										
127	968055N	Private	Unincorporated	x										
128	968056V	Western Railway Museum	Unincorporated	x										
129	968057C	Private	Unincorporated	х										
130	969804T	Private	Fairfield	Х					х	х				
131	969805A	Private Road	Fairfield	Х						x				
132	969806G	Private Road	Fairfield	Х						x				
133	TBD	Pedestrian Waterfront Access	Benicia	Х										
134	TBD	Private (S/O Tyler and Bayshore)	Benicia	Х										
135	TBD	Refinery Access Road	Benicia							x				
136	TBD	Mare Island Causeway	Vallejo										х	
137	TBD	Nimitz Avenue	Vallejo											
138	TBD - Private Exxon	Private Exxon	Benicia	X						×				
		TOTALS			6	22	4	7	35	76	0	2	25	1

Black text = Listed in FRA and CPUC databases

Blue text = Listed in FRA database

Green text = Listed in CPUC database

					Future Development		Traffi	c Data		Trair	1 Data			
Undated	07/11/2023					Annrox Distanc	e to RR Crossing					Source: FF	A Database	
No	DOT No	Roadway Name	City or Town	Private	Key Facility Type	1/4 Mile	1/2 Mile	Future AADT	Latest AADT	Source / Date	Daily Trains	Weekly Trains	Date	Max Speed
1	440675P	Huntington Drive	Fairfield	Tinuto					2.000	FRA / 2020	-	1	2021	10
									_,		38	-	2019	70
2	441093N	Pedestrian	Unincorporated										2010	
3	4505291	Industrial Court	Benicia						830	ERA / 2016	_	1	2019	10
-									000			-	2010	
4	687605K	Gate Road	Fairfield											
-	00100010	Cate Hoad	1 4.11010								-	_	_	_
-	687608E	Moridian Road	Unincorporated								_	-	-	-
3	0070001	Wendian Road	onincorporateu											
~	6976141	Rie Diven Bood	Lininggemented								-	-	-	-
6	007014J	Rio Dixon Road	Unincorporated											
-	6976450	State Doute 112	Lining a manufact								-	-	-	-
	00/0101	State Route 115	Unincorporated											
	00704034	0.11									-	-	-	-
8	687616X	COOK Lane	Unincorporated											
											-	-	-	-
9	6876191	Creed Road	Unincorporated											
											-	-	-	-
10	687622B	Lamble Road	Unincorporated											
1											-	-	-	-
11	687626D	Little Honker Bay Road	Fairfield											
1											-	-	-	-
12	687632G	Shiloh Road	Unincorporated											
											-	-	-	-
13	687634V	Dinkel Spiel Road	Fairfield											
14	751241L	Old Davis Road	Unincorporated								-	-	-	-
15	751242T	Private	Unincorporated	X							-	-	-	-
16	751244G	Private	Unincorporated	X							38	-	2019	79
17	751245N	Private	Unincorporated	Х							-	-	-	-
18	751246V	Tremont Road	Unincorporated						1,778	FRA / 2016	40	-	2019	79
19	751247C	Robben Road	Unincorporated						833	FRA / 2016	38	-	2019	79
20	751248J	Pedrick Road	Dixon						3,412	FRA / 2016	40	-	2019	79
21	751249R	Vaughn Road	Dixon						2,734	FRA / 2016	38	-	2019	79
22	751250K	1st Street	Dixon						11,440	FRA / 2016	38	-	2019	79
23	751253F	West A Street	Dixon						8,370	FRA / 2016	38	-	2019	79
24	751254M	Pitt Schoo Road	Dixon						1,195	FRA / 2016	40	-	2019	79
25	751255U	Midway Road	Unincorporated						2,698	FRA / 2016	40	-	2019	79
26	751256B	Batavia Road	Unincorporated						308	FRA / 2016	40	-	2019	79
27	751257H	Weber Road	Unincorporated						557	FRA / 2016	40	-	2019	79
28	751258P	Fox Road	Unincorporated						152	ERA / 2016	40	-	2019	79
29	751259W	l ewis Road	Unincorporated						1 487	FRA / 2016	40	-	2019	79
30	751260R	Hawkins Road	Unincorporated						1,418	FRA / 2016	40	-	2019	79
31	751288G	Elmira Road	Unincorporated						2 165	FRA / 2016	40		2019	79
32	751289N	Erv Road	Unincorporated						4 312	FRA / 2016	40	-	2019	79
33	751291P	Canon Road	Fairfield			1			7 455	FRA / 2016	40	-	2019	79
34	751294K	East Tabor Avenue	Fairfield						10.839	FRA / 2016	38		2019	79
34	7512059	Sunset Avenue	Suisun City						20 026	FRA / 2010	30 20	-	2010	79
20	751208M	Cordelia Road	Suisun City			1			20,920	FRA / 2010	40	-	2018	70
30	75120001	Cordelia Road	Suisun City			1			2,030	ERA / 1089	40		2013	25
30	7512000	Pennsylvania Avenue	Suisun City			1			2 052	FRA / 1000	-+	-	2022	25
30	751201T	Back Avenue	Eairfield			1			2,002	11/1/1900	+		2010	20
39	7512024	Cordelia Pood	Fairfield						1 200	EDA / 4000	4		2015	20
40	751302A	Chadhourro Pood	Fairfield						3 753	EDA / 1908	4	-	2010	20
41	7513036	Brivete Road	Fairfield	~					3,/53	FRA / 2013	4	-	2021	25
42	751304IN 751305V	Cordelia Road	Fairfield	~					200	EDA / 4000	4	-	2021	25
43	751305V	Brivete Road	Fairfield	~					200	FRA / 1988		-	2006	10
44	7513060	Them	Diaman	×							4	-	2021	25
45	751307J	I nomasson	Fairfield	×		+		-			4	-	2021	25
46	751309X	Private Road	⊢airfield	×		+		-			4	-	2021	25
47	7513105	Private Koad	Fairfield	X		+		-	000	ED 4 / 4000	4	-	2021	25
48	751311Y	Bridgeport Avenue	Unincorporated						300	FRA / 1988	4	-	2015	25
49	751313M	Lopes Road	Fairfield						1,200	FRA / 1979	4	-	2015	25
50	/51314U	Cordella Road Spur	Fairfield						1,700	FRA / 1988	1	-	2021	25
51	751315B	Cordelia Road	Unincorporated						200	FRA / 1988	-	-	2021	0
52	751317P	Red Top Road	Unincorporated						800	FRA / 1988	4	-	2015	25
53	751319D	Private Road	Unincorporated	X							4	-	2021	25
54	751462N	Mini Drive	Vallejo						4,800	FRA / 1988	1	-	2006	10
55	751463V	Hwy 37 / Lewis Brown Dr	Vallejo						20,000	FRA / 1989	-	1	2021	10
56	751464C	Tuolumne	Vallejo						10,500	FRA / 1995	1	-	2006	10
57	751465J	Sereno Drive	Vallejo						7,000	FRA / 1988	-	-	2021	0
58	751466R	Redwood Street	Vallejo						17,700	FRA / 1995	-	-	2021	0
59	751467X	Valle Vista Avenue	Vallejo						6,000	FRA / 1995	-	-	2021	0
60	751468E	Nebraska	Vallejo						6,200	FRA / 1988	-	-	2021	0
61	751469L	Tennessee Street	Vallejo						20,000	FRA / 1988	-	-	2021	0

					Future Development		Traffi	c Data		Trair	Data			
Updated	07/11/2023					Approx. Distanc	e to RR Crossing					Source: FF	A Database	
No.	DOT No.	Roadway Name	City or Town	Private	Key Facility Type	1/4 Mile	1/2 Mile	Future AADT	Latest AADT	Source / Date	Daily Trains	Weekly Trains	Date	Max Speed
62	751470F	Louisiana Street	Vallejo						11,800	FRA / 1995	-	-	2021	0
63	751472U	Florida Street	Vallejo						5,500	FRA / 1988	-	-	2021	0
64	751473B	Ped Xing	Vallejo								-	-	2021	0
65	751474H	Georgia Street	Vallejo						9,000	FRA / 1988	-	-	2021	0
66	751475P	Maine Street	Vallejo						8,000	FRA / 1988	-	-	2021	0
67	751476W	Solano Avenue	Vallejo						4,100	FRA / 1988	-	-	2021	0
68	751478K	5th Street	Vallejo						5,000	FRA / 1988	-	-	2021	0
69	751479S	Sonoma Boulevard	Vallejo						21,000	FRA / 1995	-	-	2021	0
70	751481T	Chestnut Street	Vallejo						700	FRA / 1988	-	-	2021	0
71	751488R	Private Duck Club	Unincorporated	Х							38	-	2019	79
72	751489X	Jacksnipe Road	Unincorporated	Х							38	-	2019	79
73	751490S	Private Duck Club	Unincorporated	X							38	-	2019	79
74	751491Y	Chadborn Road	Unincorporated	Х							38	-	2019	79
75	751493M	Private Industry	Unincorporated	Х							38	-	2019	79
76	751494U	Pierce Lane	Unincorporated						54	FRA / 2016	40	-	2019	79
77	751495B	Morrow Lane	Unincorporated	Х							38	-	2019	10
78	751498W	Lake Herman Road	Benicia								-	-	2016	79
79	751499D	Lake Herman Road	Benicia	Х							44	-	2019	60
80	751501C	Private Industry - Verizon	Benicia	Х							2	-	2019	10
81	751505E	Private	Benicia	Х							4	-	2019	10
82	751506L	Private	Benicia	X							4	-	2019	10
83	751516S	Bayshore Road	Benicia						200	FRA / 1988	-	-	2022	0
84	751517Y	Jackson Street	Benicia						500	FRA / 1988		-	2022	0
85	751518F	All Private in Yard - Valero	Benicia	Х							20	-	2016	10
86	751519M	Private	Benicia	Х							4	-	2019	10
87	751523C	Private	Benicia	Х							2	-	2019	10
88	751524J	Private	Benicia	Х							2	-	2019	10
89	751525R	Private Industry Ironworkers	Benicia	Х							4	-	2019	10
90	751527E	Park Road	Benicia						500	FRA / 1988	14	-	2019	10
91	751529T	City Street	Benicia	X					200	FRA / 1988	8	-	2019	10
92	751534P	Private Exxon	Benicia	Х					200	FRA / 1988	10	-	2016	10
93	751537K	Private Industry - Shell Oil	Benicia	X							12	-	2019	10
94	751538S	Private Industry - Shell Oil	Benicia	Х							20	-	2019	10
95	751545C	Bayshore Road	Benicia						200	FRA / 1988	6	-	2019	10
96	751546J	Industrial Way	Benicia						300	FRA / 1988	18	-	2019	10
97	751547R	Oregon Street	Benicia						50	FRA / 1988	2	-	2019	10
98	751548X	Park Road	Benicia						1,300	FRA / 2012	2	-	2019	10
99	751550Y	Industrial Way	Benicia						300	FRA / 1988	-	1	2019	10
100	751556P	East Channel Road	Benicia						300	FRA / 1970	8	-	2019	10
101	751558D	Park Road	Benicia						300	FRA / 1988	6	-	2019	10
102	751559K	Park Road	Benicia						500	FRA / 1988	10	-	2019	10
103	751560E	Nevada Street	Benicia						50	FRA / 1988	2	-	2019	10
104	751561L	lowa Street	Benicia						60	FRA / 2012	2	-	2019	10
105	751562T	Stone Way	Benicia						400	FRA / 2012	2	-	2019	10
106	751565N	Bayshore Road	Benicia								-	-	2016	60
107	751980J	Curtola Parkway	Vallejo						8,289	FRA / 1983	-	-	2021	0
108	753750P	Private Industry - Hadley	Benicia	Х	ļ				300	FRA / 2014	44	-	2019	60
109	928442W	Broadway Avenue	Vallejo								-	2	2019	10
110	928443D	Sereno Drive	Vallejo		l						-	2	2019	10
111	928445S	Redwood Street	Vallejo								-	2	2019	10
112	928446Y	Valle Vista Avenue	Vallejo								-	2	2019	10
113	928447F	Sonoma Blvd (SR 29)	Vallejo								-	2	2019	10
114	928448M	Mississippi Street	Vallejo								-	2	2019	10
115	928449U	Nebraska Street	Vallejo								-	2	2019	10
116	928450N	Wilson Avenue	Vallejo								-	2	2019	10
117	928451V	Mare Island Way	∨allejo								-	2	2019	10
118	932169Y	Private	Fairfield	X							4	-	2021	25
119	9321701	Private	Fairfield	X							4	-	2021	25
120	968046P	Private	Unincorporated	X							-	1	2015	30
121	968047W	Private	Unincorporated	X							-	1	2015	30
400	0000100	Datasta	Links and the second	V									2015	
122	968048D	Private	Unincorporated	X							-	1	2015	30
	0000505	Drivets		×									0015	10
123	968050E	Private	Unincorporated	Х	ł						-	1	2015	10
4.01	0000-07	Diada Las II D. J	1.							EDA / COLE			0015	40
124	9680521	Birds Landing Road	Unincorporated						20	FRA / 2015	-	1	2015	10
1	0000521	D-birth.	the second second	¥							0		0015	10
125	968053A	Private	Unincorporated	×	+				+		б	-	2015	10
100	0690540	Debuste	Linkson sector 1	~							0		2015	20
126	9680546	Private	Unincorporated	~							ŏ	-	2015	30
107	0680EEN	Privato	Unincorporated	×							p		2015	20
127	NICCUODE	rivate	unincorporated	~	1	1	1	1	1	1	Ø	-	2015	30

					Future Development		Traffic Data		Train Data					
Updated	07/11/2023					Approx. Distance	e to RR Crossing					Source: FR	A Database	
No.	DOT No.	Roadway Name	City or Town	Private	Key Facility Type	1/4 Mile	1/2 Mile	Future AADT	Latest AADT	Source / Date	Daily Trains	Weekly Trains	Date	Max Speed
128	968056V	Western Railway Museum	Unincorporated	Х							24	-	2015	20
129	968057C	Private	Unincorporated	X							-	1	2017	30
130	969804T	Private	Fairfield	Х							1	-	2021	10
131	969805A	Private Road	Fairfield	Х							4	-	2021	10
132	969806G	Private Road	Fairfield	Х							4	-	2021	10
133	TBD	Pedestrian Waterfront Access	Benicia	Х							-	-	-	-
134	TBD	Private (S/O Tyler and Bayshore)	Benicia	Х							-	-	-	-
135	TBD	Refinery Access Road	Benicia								-	-	-	-
136	TBD	Mare Island Causeway	Vallejo								-	-	-	-
137	TBD	Nimitz Avenue	Vallejo								-	-	-	-
138	TBD - Private Exxon	Private Exxon	Benicia	Х							-	-	-	-

Black text = Listed in FRA and CPUC databases

Blue text = Listed in FRA database Green text = Listed in CPUC database

APPENDIX C – METHODOLOGY CRITERIA LEVELS OF IMPORTANCE

Incidents Types of Incident Level of Importance												
Types of Incident	Number of Incidents	Level of Importance										
Fatalities	1 or more											
	2 or more	L										
Injuries	1											
Collision (No Injuries) and	2 or more											
Near Misses	1											
Proxim	ity to Key Facilities											
Types of Facility	Proximity	Level of Importance										
• Schools	Within ¼ mile											
• Senior Centers / Community Centers	½ mile to ¼ mile	6										
 Transit Station / Center Industrial Center Large Employment Area Hospital Park Government Centers 	Within ½ mile											
T	raffic Volumes											
Existing and Future Average Daily Traffic V	'olumes	Level of Importance										
More than 15,000		L										
Between 5,000 and 15,000												
Less than 5,000												
Train S	peeds and Volumes											
Train Speeds	Daily Trains	Level of Importance										
Greater than 75mph	12 or more	•										
	Less than 12											
Between 35mph and 75mph	12 or more											
	Less than 12											
Less then 25mm	12 or more											
Less than 35mph	Less than 12	Not Important										
	Capital Costs											
Lower than 50 th Percentile												
Between the 50 th and 75 th Percentile		•										
Between the 75 th and 95 th Percentile												
Above the 95 th Percentile												





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APPENDIX D – COST ESTIMATES





SOLANO RAIL CROSSINGS SAFETY IMPROVEMENT PLAN OPINION OF PROBABLE CONSTRUCTION COSTS (DRAFT) PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGN	ITUDE					September 2023				
		Sunset Avenue - Suisun				-				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost				
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$160,000	\$160,000				
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0				
	3	Install Roadway Elements	0	LS	\$250,000	\$0				
	4	Install Medians/Channelization	0	LS	\$150,000	\$0				
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0				
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000				
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000				
	8	Install Lighting	1	EA	\$100,000	\$100,000				
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000				
	10	Railroad Removals	0	LS	\$50,000	\$0				
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0				
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0				
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000				
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000				
				Const	ruction Subtotal:	\$1,910,000				
		Design, Environmental and	d Constructi	on Man	agement (20%):	\$382,000				
Contingency (40%):										

 Contingency (40%):
 \$764,000

 Escalation (3% for 5 years):
 \$486,742

TOTAL: \$3,542,742

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Sunset Avenue - Suisun												
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost						
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$262,000	\$262,000						
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0						
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000						
	4	Install Medians/Channelization	0	LS	\$150,000	\$0						
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000						
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000						
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000						
	<u>8</u> In	Install Lighting	1	EA	\$100,000	\$100,000						
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000						
	10	Railroad Removals	1	LS	\$50,000	\$50,000						
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000						
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000						
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000						
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000						
				Const	truction Subtotal:	\$3,032,000						
		Design, Environmental and	Construction	on Mar	nagement (20%):	\$606,400						
				Co	ntingency (40%):	\$1,212,800						
			Esca	alation	(3% for 5 years):	\$772,670						
					TOTAL:	\$5,623,870						

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Section If Project Controls	tem No.	Description		Curtola Pkwy - Vallejo									
Project Controls		Description	Quantity	Unit	Unit Cost	Extended Cost							
Demolition and Removals	1	Project Controls (10% of Construction)	1	LS	\$90,000	\$90,000							
	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000							
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000							
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000							
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0							
	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$300,000	\$300,000							
	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000							
	8	Install Lighting	0	EA	\$100,000	\$0							
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0							
	10	Railroad Removals	0	LS	\$50,000	\$0							
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0							
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0							
	13	Install Signal Cabin	0	EA	\$300,000	\$0							
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0							
· · ·				Constr	uction Subtotal:	\$990,000							
		Design, Environmental and C	Constructio	n Mana	agement (20%):	\$198,000							

\$396,000

Contingency (40%): Escalation (3% for 5 years): \$252,290

TOTAL: \$1,836,290

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

						Sehrennner 2023					
	Curtola Pkwy - Vallejo										
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost					
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 249,500.00	\$ 249,500.00					
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00					
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00					
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00					
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00					
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$ 300,000.00	\$ 300,000.00					
Installations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00					
	8	Install Lighting	1	EA	\$ 100,000.00	\$ 100,000.00					
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated	1	LS	\$ 500.000.00						
	9	Improvements			+	\$ 500,000.00					

September 2023

	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00
	13	Install Signal Cabin	1	EA	\$	300,000.00	\$ 300,000.00
	14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$ 150,000.00
				Const	ructi	on Subtotal:	\$ 2,894,500

Design, Environmental and Construction Management (20%): \$ 578,900

1,157,800 \$737,630

Contingency (40%): \$ Escalation (3% for 5 years): TOTAL: \$

5,368,830

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Sereno Drive - Vallejo				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$130,000	\$130,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	truction Subtotal:	\$1,430,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$286,000

\$572,000

\$364,419

\$2,652,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

		Sereno Drive - Vallejo				-
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 239,500.00	\$ 239,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$ 300,000.00	\$ 600,000.00
mstallations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00
	8	Install Lighting	2	EA	\$ 100,000.00	\$ 200,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$ 500,000.00	\$ -
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$ 250,000.00	\$ 500,000.00

13	Install Signal Cabin	1	EA	\$ 3	300,000.00	\$	300,000.00	
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00	
			Cons	structio	n Subtotal:	\$	2,784,500	
	Design, Environmental and	Constructi	ion Ma	nagem	ent (20%):	\$	556,900	
			Co	ontingei	ncy (40%):	\$	1,113,800	
Escalation (3% for 5 years):								
					TOTAL:	\$	5,164,798	

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Redwood St - Vallejo (928445S)				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$130,000	\$130,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	truction Subtotal:	\$1,430,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$286,000

\$572,000

\$364,419

\$2,652,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

							· · · · · · · · · · · · · · · · · · ·
		Redwood St - Vallejo (928445S)					
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	239,500.00	\$ 239,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00
	8	Install Lighting	2	EA	\$	100,000.00	\$ 200,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00
					-		

13	Install Signal Cabin	1	EA	\$ 3	300,000.00	\$	300,000.00	
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00	
			Cons	structio	n Subtotal:	\$	2,784,500	
	Design, Environmental and	Constructi	ion Ma	nagem	ent (20%):	\$	556,900	
			Co	ontingei	ncy (40%):	\$	1,113,800	
Escalation (3% for 5 years):								
					TOTAL:	\$	5,164,798	

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Valle- Vista Ave - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$130,000 Project Controls Project Controls (10% of Construction) LS \$130,000 1 1 LS Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$150,000 1 5 Install 2 UPRR Access Gates 0 ΕA \$35,000 Install 2 Quadrants of Full Pedestrian Treatments \$300,000 6 2 ΕA \$600,000 Installations Install pavement markings and signage LS 7 1 \$100,000 \$100,000 8 Install Lighting ΕA \$100,000 \$100,000 1 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$50,000 10 Railroad Removals 0 LS 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA ΕA \$300,000 13 Install Signal Cabin 0 Railroad Signal Design Allowance \$150,000 LS 14 0 Construction Subtotal: \$1,430,000

Design, Environmental and Construction Management (20%): \$286,000

Contingency (40%): \$572,000

Escalation (3% for 5 years): \$364,419 TOTAL:

\$2,652,419

\$0

\$0 \$0

\$0

\$0

\$0

\$0

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	OUGH ORDER OF MAGNITUDE September								
		Valle- Vista Ave - Vallejo							
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	214,500.00	\$ 214,500.00		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00		
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00		
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00		
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00		
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00		
	8	Install Lighting	2	EA	\$	100,000.00	\$ 200,000.00		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -		
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00		
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00		
RR Improvements	12	Install 2 Railroad Devices	1	FΔ	\$	250 000 00	\$ 250,000,00		

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00	
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00	
			Cons	structio	on Subtotal:	\$	2,509,500	
	Design, Environmental and	Constructi	ion Ma	nagen	nent (20%):	\$	501,900	
			Co	ontinge	ency (40%):	\$	1,003,800	
Escalation (3% for 5 years):								
					TOTAL:	\$	4,654,717	

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Sonoma Blvd (SR-29) - Vallejo				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$130,000	\$130,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	ruction Subtotal:	\$1,430,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$286,000

\$572,000

\$364,419

\$2,652,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

	Sonoma Blvd (SR-29) - Valleio										
Section	Item No	Description	Quantity	Unit	<u> </u>	Unit Cost	Extended Cost				
Breiset Gestade		Description Description	Quantity			000 500 00					
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	289,500.00	\$ 289,500.00				
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00				
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00				
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00				
Installations	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00				
	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00				
mataliationa	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00				
	8	Install Lighting	2	EA	\$	100,000.00	\$ 200,000.00				
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$	500,000.00	\$ 500,000.00				
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00				
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00				
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00				
			-		-						

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
			Cons	structio	on Subtotal:	\$	3,334,500		
	Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years):								
					TOTAL:	\$	6,184,959		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Mississippi Street - Vallejo				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$130,000	\$130,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	ruction Subtotal:	\$1,430,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$286,000

\$572,000

\$364,419

\$2,652,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

		Mississippi Street - Vallejo				-
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 264,500.00	\$ 264,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$ 300,000.00	\$ 600,000.00
mataliations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00
	8	Install Lighting	2	EA	\$ 100,000.00	\$ 200,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$ 500,000.00	\$ 500,000.00
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$ 250,000.00	\$ 250,000.00

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
			Cons	structi	ion Subtotal:	\$	3,059,500		
	Design, Environmental and Construction Management (20%):								
			Co	onting	ency (40%):	\$	1,223,800		
Escalation (3% for 5 years):									
					TOTAL:	\$	5,674,878		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Nebraska Street - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$130,000 Project Controls Project Controls (10% of Construction) LS \$130,000 1 1 LS Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$150,000 1 5 Install 2 UPRR Access Gates 0 ΕA \$35,000 \$0 Install 2 Quadrants of Full Pedestrian Treatments \$300,000 6 2 ΕA \$600,000 Installations LS 7 Install pavement markings and signage 1 \$100,000 \$100,000 8 Install Lighting ΕA \$100,000 \$100,000 1 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$0 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$0 ΕA \$300,000 13 Install Signal Cabin 0 \$0 Railroad Signal Design Allowance \$150,000 LS 14 0 Construction Subtotal: \$1,430,000

Design, Environmental and Construction Management (20%): \$286,000

Contingency (40%): \$572,000

Escalation (3% for 5 years): \$364,419 TOTAL:

\$2,652,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

	Nebraska Street - Vallejo										
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost				
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	212,000.00	\$ 212,000.00				
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00				
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00				
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00				
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00				
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00				
mstallations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00				
	8	Install Lighting	1	EA	\$	100,000.00	\$ 100,000.00				
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -				
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00				
	11	Install 1 Track of Crossing Panels	2	EA	\$	75,000.00	\$ 150,000.00				
RR Improvements	12	Install 2 Bailroad Devices	1	FΔ	\$	250 000 00	\$ 250,000,00				

	13	Install Signal Cabin	1	EA	\$ 3	300,000.00	\$	300,000.00	
	14	Railroad Signal Design Allowance	1	LS	\$ 1	150,000.00	\$	150,000.00	
				Cons	struction	n Subtotal:	\$	2,482,000	
		Design, Environmental and	Constructi	ion Ma	nageme	ent (20%):	\$	496,400	
				Co	ontingen	ncy (40%):	\$	992,800	
Escalation (3% for 5 years):									
						TOTAL:	\$	4,603,709	

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Wilson Avenue - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$140,000 Project Controls Project Controls (10% of Construction) LS \$140,000 1 1 LS \$100,000 Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 1 3 Install Roadway Elements LS \$500,000 2 \$250,000 4 Install Medians/Channelization LS \$150,000 \$0 0 \$35,000 5 Install 2 UPRR Access Gates 0 ΕA \$0 Install 2 Quadrants of Full Pedestrian Treatments \$300,000 6 2 ΕA \$600,000 Installations Install pavement markings and signage LS 7 2 \$100,000 \$200,000 8 Install Lighting ΕA \$100,000 \$0 0 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$0 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$0 ΕA \$300,000 13 Install Signal Cabin 0 \$0 Railroad Signal Design Allowance \$150,000 LS 14 0 Construction Subtotal: \$1,540,000

Design, Environmental and Construction Management (20%): \$308,000

Contingency (40%): \$616,000

Escalation (3% for 5 years): \$392,451 TOTAL:

\$2,856,451

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

		Wilson Avenue - Vallejo				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 224,500.00	\$ 224,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	2	LS	\$ 250,000.00	\$ 500,000.00
	4	Install Medians/Channelization	0	LS	\$ 150,000.00	\$ -
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$ 300,000.00	\$ 600,000.00
mataliationa	7	Install pavement markings and signage	2	LS	\$ 100,000.00	\$ 200,000.00
	8	Install Lighting	1	EA	\$ 100,000.00	\$ 100,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$ 500,000.00	\$ -
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	1	FΔ	\$ 250 000 00	\$ 250,000,00

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00			
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00			
			Cons	structio	on Subtotal:	\$	2,619,500			
	Design, Environmental and Construction Management (20%):									
			Co	ontinge	ency (40%):	\$	1,047,800			
	Escalation (3% for 5 years):									
					TOTAL:	\$	4,858,750			

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Mare Island Way - Vallejo				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$75,000	\$75,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	0	LS	\$150,000	\$0
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$300,000	\$300,000
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	0	EA	\$100,000	\$0
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	truction Subtotal:	\$825,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$165,000

\$330,000

\$210,242

\$1,530,242

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGNITUDE September 2										
		Mare Island Way - Vallejo								
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	274,500.00	\$ 274,500.00			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00			
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00			
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00			
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$	300,000.00	\$ 300,000.00			
mstallations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00			
	8	Install Lighting	1	EA	\$	100,000.00	\$ 100,000.00			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$	500,000.00	\$ 500,000.00			
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00			
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00			
RR Improvements	12	Install 2 Railroad Devices	3	EA	\$	250,000.00	\$ 750,000.00			

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
			Cons	struct	ion Subtotal:	\$	3,169,500		
	Design, Environmental and Construction Management (20%): \$								
			Co	onting	gency (40%):	\$	1,267,800		
	Escalation (3% for 5 years):								
					TOTAL:	\$	5,878,911		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Nebraska Street - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$120,000 Project Controls Project Controls (10% of Construction) LS \$120,000 1 1 LS Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$150,000 1 \$35,000 5 Install 2 UPRR Access Gates 0 ΕA \$0 Install 2 Quadrants of Full Pedestrian Treatments \$300,000 6 2 ΕA \$600,000 Installations 7 Install pavement markings and signage 1 LS \$100,000 \$100,000 8 Install Lighting ΕA \$100,000 \$0 0 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$0 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$0 Install Signal Cabin ΕA \$300,000 13 0 \$0 Railroad Signal Design Allowance \$150,000 LS 14 0 Construction Subtotal: \$1,320,000

Design, Environmental and Construction Management (20%): \$264,000

Contingency (40%): \$528,000

Escalation (3% for 5 years): \$336,387 TOTAL:

\$2,448,387

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Nebraska Street - Vallejo										
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost				
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 229,500.00	\$ 229,500.00				
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00				
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00				
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00				
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00				
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$ 300,000.00	\$ 600,000.00				
mataliationa	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00				
	8	Install Lighting	1	EA	\$ 100,000.00	\$ 100,000.00				
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$ 500,000.00	\$ -				
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00				
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00				
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$ 250,000.00	\$ 500,000.00				
	13	Install Signal Cabin	1	EA	\$ 300,000.00	\$ 300,000.00				
	14	Railroad Signal Design Allowance	1	LS	\$ 150,000.00	\$ 150,000.00				
				Cons	truction Subtotal:	\$ 2,674,500				
		Design, Environmental and	Constructi	on Mar	nagement (20%):	\$ 534,900				
				Co	ntingency (40%):	\$ 1,069,800				
			Esca	alation	(3% for 5 years):	\$681,566				
					TOTAL:	\$ 4,960,766				

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Tennessee Street - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$185,000 Project Controls Project Controls (10% of Construction) LS \$185,000 1 1 Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments LS \$100,000 \$100,000 1 Install Roadway Elements LS \$250,000 3 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$0 0 \$35,000 5 Install 2 UPRR Access Gates 0 ΕA \$0 Install 2 Quadrants of Full Pedestrian Treatments 6 2 ΕA \$300,000 \$600,000 Installations 7 Install pavement markings and signage 1 LS \$100,000 \$100,000 8 ΕA \$100,000 \$0 Install Lighting 0 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$500,000 **RR** Improvements 12 Install 2 Railroad Devices 2 ΕA \$250,000 Install Signal Cabin \$300,000 \$300,000 13 EΑ 1 Railroad Signal Design Allowance \$150,000 LS \$150,000 14 1 Construction Subtotal: \$2,185,000

Design, Environmental and Construction Management (20%): \$437,000

Contingency (40%): \$874,000

Escalation (3% for 5 years): \$556,822 TOTAL:

\$4,052,822

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Tennessee Street - Vallejo										
Section	Item No.	Description	Quantity	Unit	U U	Init Cost	Extended Co	ost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	274,500.00	\$ 274,50	00.00		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,00	00.00		
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,00	00.00		
	4	Install Medians/Channelization	0	LS	\$	150,000.00	\$	-		
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,00	00.00		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,00	00.00		
mstallations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,00	00.00		
	8	Install Lighting	2	EA	\$	100,000.00	\$ 200,00	00.00		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$	500,000.00	\$ 500,00	00.00		
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,00	00.00		
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,00	00.00		
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,00	00.00		
	13	Install Signal Cabin	1	EA	\$	300,000.00	\$ 300,00	00.00		
	14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$ 150,00	00.00		
				Cons	struction	on Subtotal:	\$ 3,169	,500		
		Design, Environmental and	Constructi	on Mai	nager	ment (20%):	\$ 633	,900		
Contingency (40%):								,800		
			Esca	alation	(3% f	for 5 years):	\$807	7,711		
					``	TOTAL:	\$ 5,878	,911		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Louisiana Street - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$155,000 Project Controls Project Controls (10% of Construction) LS \$155,000 1 1 LS Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$150,000 1 5 Install 2 UPRR Access Gates 0 ΕA \$35,000 \$0 Install 2 Quadrants of Full Pedestrian Treatments \$300,000 6 2 ΕA \$600,000 Installations LS 7 Install pavement markings and signage 1 \$100,000 \$100,000 8 Install Lighting ΕA \$100,000 \$100,000 1 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$250,000 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 1 ΕA ΕA \$300,000 \$0 13 Install Signal Cabin 0 \$0 Railroad Signal Design Allowance \$150,000 LS 14 0 Construction Subtotal: \$1,705,000

Design, Environmental and Construction Management (20%): \$341,000

Contingency (40%): \$682,000

Escalation (3% for 5 years): \$434,500 TOTAL:

\$3,162,500

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Louisiana Street - Vallejo											
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost				
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	239,500.00	\$ 239,500.00				
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00				
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00				
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00				
	5	Install 2 UPRR Access Gates	2	ΕA	\$	35,000.00	\$ 70,000.00				
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	ΕA	\$	300,000.00	\$ 600,000.00				
Installations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00				
	8	Install Lighting	2	ΕA	\$	100,000.00	\$ 200,000.00				
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -				
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00				
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00				
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00				

13	Install Signal Cabin	1	EA	\$ 3	300,000.00	\$	300,000.00	
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00	
Construction Subtotal:								
	Design, Environmental and	Constructi	ion Ma	nagem	ent (20%):	\$	556,900	
Contingency (40%):								
Escalation (3% for 5 years):								
					TOTAL:	\$	5,164,798	

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023						
Florida Street - Vallejo												
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost						
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$155,000	\$155,000						
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000						
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000						
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000						
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0						
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000						
mataliations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000						
	8	Install Lighting	1	EA	\$100,000	\$100,000						
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0						
	10	Railroad Removals	0	LS	\$50,000	\$0						
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0						
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000						
	13	Install Signal Cabin	0	EA	\$300,000	\$0						
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0						
				Const	truction Subtotal:	\$1,705,000						

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$341,000

\$682,000

\$434,500

\$3,162,500

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Florida Street - Vallejo											
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost				
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	239,500.00	\$ 239,500.00				
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00				
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00				
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00				
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00				
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00				
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00				
	8	Install Lighting	2	EA	\$	100,000.00	\$ 200,000.00				
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -				
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00				
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00				
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00				

1:	13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00
14	14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00
Construction Subtotal:								2,784,500
		Design, Environmental and	Constructi	ion Ma	nage	ment (20%):	\$	556,900
	Contingency (40%):							
Escalation (3% for 5 years):								\$709,598
						TOTAL:	\$	5,164,798

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023						
Ped Xing - Vallejo												
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost						
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$115,000	\$115,000						
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000						
	3	Install Roadway Elements	0	LS	\$250,000	\$0						
	4	Install Medians/Channelization	0	LS	\$150,000	\$(
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$(
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$300,000	\$300,000						
mataliations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000						
	8	Install Lighting	1	EA	\$100,000	\$100,000						
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$(
	10	Railroad Removals	0	LS	\$50,000	\$(
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0						
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000						
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000						
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000						
				Cons	truction Subtotal:	\$1,415,000						

Design, Environmental and Construction Management (20%): \$283,000

\$566,000

Contingency (40%): Escalation (3% for 5 years): TOTAL: \$360,597

\$2,624,597

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Ped Xing - Vallejo									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Ex	ctended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 152,500.00	\$	152,500.00		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$	100,000.00		
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$	250,000.00		
	4	Install Medians/Channelization	0	LS	\$ 150,000.00	\$	-		
	5	Install 2 UPRR Access Gates	0	EA	\$ 35,000.00	\$	-		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$ 300,000.00	\$	300,000.00		
mstallations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$	100,000.00		
	8	Install Lighting	1	EA	\$ 100,000.00	\$	100,000.00		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$ 500,000.00	\$	-		
	10	Railroad Removals	1	LS	\$ 50,000.00	\$	50,000.00		
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$	75,000.00		
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$ 250,000.00	\$	250,000.00		
	13	Install Signal Cabin	1	EA	\$ 300,000.00	\$	300,000.00		
	14	Railroad Signal Design Allowance	1	LS	\$ 150,000.00	\$	150,000.00		
				Cons	truction Subtotal:	\$	1,827,500		
		Design, Environmental and	Constructi	on Mar	nagement (20%):	\$	365,500		
				Co	ntingency (40%)	\$	731,000		
			Esca	alation	(3% for 5 years):		\$465,717		
					TOTAL	\$	3,389,717		
PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Georgia Street - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$135,000 Project Controls Project Controls (10% of Construction) LS \$135,000 1 1 LS Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$300,000 2 5 Install 2 UPRR Access Gates ΕA \$35,000 \$0 0 Install 2 Quadrants of Full Pedestrian Treatments \$300,000 6 2 ΕA \$600,000 Installations 7 Install pavement markings and signage 1 LS \$100,000 \$100,000 8 Install Lighting ΕA \$100,000 \$0 0 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$0 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$0 Install Signal Cabin ΕA \$300,000 13 0 \$0 Railroad Signal Design Allowance \$150,000 LS 14 0 \$1,485,000 Construction Subtotal:

Design, Environmental and Construction Management (20%): \$297,000

Contingency (40%): \$594,000

Escalation (3% for 5 years): \$378,435 TOTAL:

\$2,754,435

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

		Georgia Street - Vallejo				-		
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 219,500.00	\$ 219,500.00		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00		
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00		
	4	Install Medians/Channelization	2	LS	\$ 150,000.00	\$ 300,000.00		
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$ 300,000.00	\$ 600,000.00		
	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00		
	8	Install Lighting	1	EA	\$ 100,000.00	\$ 100,000.00		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$ 500,000.00	\$ -		
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00		
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00		
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$ 250,000.00	\$ 250,000.00		
	13	Install Signal Cabin	1	EA	\$ 300,000.00	\$ 300,000.00		
	14	Railroad Signal Design Allowance	1	LS	\$ 150,000.00	\$ 150,000.00		
				Cons	truction Subtotal:	\$ 2,564,500		
Design, Environmental and Construction Management (20%): \$								
Contingency (40%): \$								
Escalation (3% for 5 years):								
					TOTAL:	\$ 4,756,733		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Maine Street - Vallejo				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$130,000	\$130,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$C
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	ruction Subtotal:	\$1,430,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$286,000

\$572,000

\$364,419

\$2,652,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

							•
		Maine Street - Vallejo					
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	229,500.00	\$ 229,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00
	8	Install Lighting	1	EA	\$	100,000.00	\$ 100,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00
			-		-		

13	Install Signal Cabin	1	EA	\$ 30	00,000.00	\$	300,000.00			
14	Railroad Signal Design Allowance	1	LS	\$ 15	50,000.00	\$	150,000.00			
	Construction Subtotal: \$									
	Design, Environmental and Construction Management (20%):									
			Co	ontingenc	cy (40%):	\$	1,069,800			
Escalation (3% for 5 years):										
					TOTAL:	\$	4,960,766			

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Solano Avenue - Vallejo Extended Cost Section Item No. Description Quantity Unit Unit Cost \$60,000 Project Controls Project Controls (10% of Construction) LS \$60,000 1 1 Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments LS \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$150,000 1 \$35,000 5 Install 2 UPRR Access Gates 0 ΕA \$0 Install 2 Quadrants of Full Pedestrian Treatments \$300,000 \$0 6 0 ΕA Installations Install pavement markings and signage LS \$100,000 7 1 \$100,000 8 Install Lighting ΕA \$100,000 \$0 0 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 Install 1 Track of Crossing Panels 11 ΕA \$75,000 0 \$0 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$0 ΕA \$300,000 13 Install Signal Cabin 0 \$0 Railroad Signal Design Allowance \$150,000 LS 14 0 \$660,000 Construction Subtotal:

Design, Environmental and Construction Management (20%): \$132,000

Contingency (40%): \$264,000

Escalation (3% for 5 years): \$168,193 TOTAL:

\$1,224,193

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGN	TUDE						S	eptember 2023
		Solano Avenue - Vallejo						
Section	Item No.	Description	Quantity	Unit	l	Unit Cost	E	xtended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	169,500.00	\$	169,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$	100,000.00
	3	Install Roadway Elements	2	LS	\$	250,000.00	\$	500,000.00
Installations	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$	150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$	70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$	300,000.00	\$	
	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$	100,000.00
	8	Install Lighting	1	EA	\$	100,000.00	\$	100,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$	-
Section Project Controls Demolition and Removals Installations RR Improvements	10	Railroad Removals	1	LS	\$	50,000.00	\$	50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$	75,000.00
	12	Install 2 Railroad Devices	1	EA	\$	250,000.00	\$	250,000.00
	13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00
	14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00
				Cons	struct	ion Subtotal:	\$	2,014,500
		Design, Environmental and	Constructi	on Ma	nage	ement (20%):	\$	402,900
Contingency (40%): \$								
			Esca	alation	(3%	for 5 years):		\$513,372
					-	TOTAL:	\$	3,736,572

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Park Road - Benicia Extended Cost Section Item No. Description Quantity Unit Unit Cost \$120,000 Project Controls Project Controls (10% of Construction) LS \$120,000 1 1 LS Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$150,000 1 5 Install 2 UPRR Access Gates 0 ΕA \$35,000 \$300,000 6 Install 2 Quadrants of Full Pedestrian Treatments 0 ΕA Installations LS \$100,000 7 Install pavement markings and signage 1 \$100,000 8 Install Lighting ΕA \$100,000 \$100,000 1 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements \$500,000 1 \$500,000 \$50,000 10 Railroad Removals 0 LS Install 1 Track of Crossing Panels 11 ΕA \$75,000 0 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$250,000 ΕA \$300,000 13 Install Signal Cabin 0 Railroad Signal Design Allowance LS \$150,000 14 0 Construction Subtotal: \$1,320,000

Design, Environmental and Construction Management (20%): \$264,000

Contingency (40%): \$528,000

Escalation (3% for 5 years): \$336,387 TOTAL:

\$2,448,387

\$0

\$0

\$0 \$0

\$0

\$0

\$0

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGN	TUDE					September 2023
		Park Road - Benicia				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 229,500.00	\$ 229,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$ 300,000.00	\$ -
mataliations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00
	8	Install Lighting	2	EA	\$ 100,000.00	\$ 200,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$ 500,000.00	\$ 500,000.00
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Bailroad Devices	2	FΔ	\$ 250 000 00	\$ 500,000,00

13	Install Signal Cabin	1	EA	\$ 30	00,000.00	\$	300,000.00			
14	Railroad Signal Design Allowance	1	LS	\$ 15	50,000.00	\$	150,000.00			
	Construction Subtotal: \$									
	Design, Environmental and Construction Management (20%):									
			Co	ontingenc	cy (40%):	\$	1,069,800			
Escalation (3% for 5 years):										
					TOTAL:	\$	4,960,766			

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Industrial Way - Benicia Extended Cost Section Item No. Description Quantity Unit Unit Cost \$110,000 Project Controls Project Controls (10% of Construction) LS \$110,000 1 1 LS \$100,000 Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$0 0 \$35,000 \$0 5 Install 2 UPRR Access Gates 0 ΕA \$0 6 Install 2 Quadrants of Full Pedestrian Treatments 0 ΕA \$300,000 Installations Install pavement markings and signage \$100,000 7 1 LS \$100,000 \$100,000 8 Install Lighting ΕA \$100,000 1 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$250,000 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 1 ΕA \$300,000 \$300,000 13 Install Signal Cabin EΑ 1 Railroad Signal Design Allowance \$150,000 LS \$150,000 14 1 Construction Subtotal: \$1,360,000 Design, Environmental and Construction Management (20%): \$272,000

Contingency (40%): \$544,000

Escalation (3% for 5 years): \$346,580 TOTAL:

\$2,522,580

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGN	TUDE					September 2023
		Industrial Way - Benicia				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 154,500.00	\$ 154,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$ 300,000.00	\$ -
mataliations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00
	8	Install Lighting	2	EA	\$ 100,000.00	\$ 200,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$ 500,000.00	\$ -
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	1	FΔ	\$ 250 000 00	\$ 250,000,00

13	Install Signal Cabin	1	EA	\$ 3	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
			Cons	structio	n Subtotal:	\$	1,849,500		
	Design, Environmental and Construction Management (20%):								
			Co	ontinger	ncy (40%):	\$	739,800		
Escalation (3% for 5 years):									
					TOTAL:	\$	3,430,524		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 **Robben Road - Unincorporated** Extended Cost Section Item No. Description Quantity Unit Unit Cost \$70,000 Project Controls Project Controls (10% of Construction) LS \$70,000 1 1 Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments LS \$100,000 \$100,000 1 Install Roadway Elements LS \$250,000 3 \$250,000 1 4 Install Medians/Channelization LS \$150,000 \$150,000 1 Install 2 UPRR Access Gates 5 0 ΕA \$35,000 \$0 Install 2 Quadrants of Full Pedestrian Treatments \$0 6 0 ΕA \$300,000 Installations \$100,000 7 Install pavement markings and signage 1 LS \$100,000 \$100,000 8 ΕA \$100,000 Install Lighting 1 LS 9 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 0 \$500,000 \$0 \$0 \$50,000 10 Railroad Removals 0 LS \$0 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 \$0 \$250,000 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$0 Install Signal Cabin \$300,000 13 0 EΑ \$0 Railroad Signal Design Allowance \$150,000 LS 14 0 Construction Subtotal: \$770,000

Design, Environmental and Construction Management (20%): \$154,000

Contingency (40%): \$308,000

Escalation (3% for 5 years): \$196,226 TOTAL:

\$1,428,226

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGN	TUDE						S	eptember 2023
		Robben Road - Unincorporated						
Section	Item No.	Description	Quantity	Unit		Unit Cost	E	xtended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	154,500.00	\$	154,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$	100,000.00
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$	250,000.00
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$	150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$	70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$	300,000.00	\$	_
	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$	100,000.00
	8	Install Lighting	2	EA	\$	100,000.00	\$	200,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$	-
Demolition and Removals Installations RR Improvements	10	Railroad Removals	1	LS	\$	50,000.00	\$	50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$	75,000.00
	12	Install 2 Railroad Devices	1	EA	\$	250,000.00	\$	250,000.00
	13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00
	14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00
				Cons	struc	tion Subtotal:	\$	1,849,500
		Design, Environmental and	Constructi	on Ma	nage	ement (20%):	\$	369,900
Contingency (40%): \$								
Escalation (3% for 5 years):								
						TOTAL:	\$	3,430,524

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		1st Street - Dixon				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$55,000	\$55,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	0	LS	\$150,000	\$0
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
-	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	truction Subtotal:	\$605,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$121,000

\$242,000

\$154,177

\$1,122,177

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

	1st Street - Dixon					
Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost
1	Project Controls (10% of Construction)	1	LS	\$	164,500.00	\$ 164,500.00
2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00
3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00
4	Install Medians/Channelization	0	LS	\$	150,000.00	\$ -
5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00
6	Install 2 Quadrants of Full Pedestrian Treatments		EA	\$	300,000.00	\$ -
7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00
8	Install Lighting	2	EA	\$	100,000.00	\$ 200,000.00
9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -
10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00
11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00
12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00
	Item No. 1 2 3 4 5 6 7 8 9 10 11 12	Ist Street - DixonItem No.Description1Project Controls (10% of Construction)2Remove concrete, asphalt, striping, utility adjustments3Install Roadway Elements4Install Medians/Channelization5Install 2 UPRR Access Gates6Install 2 Quadrants of Full Pedestrian Treatments7Install pavement markings and signage8Install Lighting9Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements10Railroad Removals11Install 1 Track of Crossing Panels12Install 2 Railroad Devices	Ist Street - DixonItem No.DescriptionQuantity1Project Controls (10% of Construction)12Remove concrete, asphalt, striping, utility adjustments13Install Roadway Elements14Install Medians/Channelization05Install 2 UPRR Access Gates26Install 2 Quadrants of Full Pedestrian Treatments17Install 2 Quadrants of Full Pedestrian Treatments26Install Pavement markings and signage18Install Lighting29Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements010Railroad Removals111Install 1 Track of Crossing Panels112Install 2 Railroad Devices2	Ist Street - DixonItem No.QuantityUnit1Project Controls (10% of Construction)1LS2Remove concrete, asphalt, striping, utility adjustments1LS3Install Roadway Elements1LS4Install Medians/Channelization0LS5Install 2 UPRR Access Gates2EA6Install 2 Quadrants of Full Pedestrian Treatments1LS8Install Pavement markings and signage1LS9Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements0LS10Railroad Removals1LS11Install 1 Track of Crossing Panels1EA12Install 2 Railroad Devices2EA	Item No.QuantityUnit1Project Controls (10% of Construction)1LS\$2Remove concrete, asphalt, striping, utility adjustments1LS\$3Install Roadway Elements1LS\$4Install Medians/Channelization0LS\$5Install 2 UPRR Access Gates2EA\$6Install 2 Quadrants of Full Pedestrian TreatmentsEA\$7Install pavement markings and signage1LS\$8Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements0LS\$10Railroad Removals1LS\$11Install 1 Track of Crossing Panels1EA\$12Install 2 Railroad Devices2EA\$	Item No.QuantityUnit CostItem No.QuantityUnitCurit Cost111.5\$164,500.002Remove concrete, asphalt, striping, utility adjustments11.5\$100,000.00311.5\$250,000.0011.5\$250,000.00411.5\$150,000.0011.5\$150,000.00511.51.5\$150,000.0011.5\$300,000.0061.51.51.5\$300,000.0011.5\$300,000.0071.51.51.01.5\$100,000.0011.5\$100,000.0081.51.51.01.5\$100,000.0011.5\$100,000.009Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements01.5\$500,000.0010Railroad Removals11.5\$500,000.00111.51.51.5500,000.0011.5\$500,000.00121.51.51.51.51.51.51.51.51.5111.51.51.51.51.51.51.51.51.51.5121.51.51.51.51.51.51.51.51.51.51.5131.51.51.5 <t< td=""></t<>

13	Install Signal Cabin	1	EA	\$ 300,0	000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$ 150,0	000.00	\$	150,000.00		
Construction Subtotal:									
	Design, Environmental and	Constructi	ion Ma	nagement ((20%):	\$	391,900		
			Co	ontingency ((40%):	\$	783,800		
		Esca	alation	(3% for 5 y	years):		\$499,356		
				т	OTAL:	\$	3,634,556		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Hawkins Rd - Unincorporated				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$55,000	\$55,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	0	LS	\$150,000	\$0
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	truction Subtotal:	\$605,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$121,000

\$242,000

\$154,177

\$1,122,177

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

	Hawkins Rd - Unincorporated											
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost					
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	172,000.00	\$ 172,000.00					
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00					
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00					
	4	Install Medians/Channelization	0	LS	\$	150,000.00	\$					
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00					
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$	300,000.00	\$ -					
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00					
	8	Install Lighting	2	EA	\$	100,000.00	\$ 200,000.00					
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -					
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00					
	11	Install 1 Track of Crossing Panels	2	EA	\$	75,000.00	\$ 150,000.00					
RR Improvements	12	Install 2 Railroad Devices	2	FΔ	\$	250 000 00	\$ 500,000,00					

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
Construction Subtotal:									
	Design, Environmental and	Constructi	ion Ma	nage	ment (20%):	\$	408,400		
			Co	onting	jency (40%):	\$	816,800		
Escalation (3% for 5 years):									
					TOTAL:	\$	3,787,580		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Lopes Rd - Fairfield				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$60,000	\$60,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$C
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$C
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	0	EA	\$100,000	\$C
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$C
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$C
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$C
	13	Install Signal Cabin	0	EA	\$300,000	\$C
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Cons	truction Subtotal:	\$660,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$132,000

\$264,000

\$168,193

\$1,224,193

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

	Lopes Rd - Fairfield											
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost					
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	194,500.00	\$ 194,500.00					
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00					
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00					
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00					
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00					
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$	300,000.00	\$ -					
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00					
	8	Install Lighting	1	EA	\$	100,000.00	\$ 100,000.00					
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -					
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00					
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00					
RR Improvements	12	Install 2 Railroad Devices	3	EA	\$	250,000.00	\$ 750,000.00					

13	Install Signal Cabin	1	EA	\$ 3	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$ 1	150,000.00	\$	150,000.00		
Construction Subtotal:									
	Design, Environmental and	Constructi	ion Ma	nagem	ent (20%):	\$	457,900		
			Co	ontinger	ncy (40%):	\$	915,800		
Escalation (3% for 5 years):									
					TOTAL:	\$	4,246,653		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Mini Dr- Vallejo				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$165,000	\$165,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	0	LS	\$150,000	\$0
Installations	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Cons	truction Subtotal:	\$1,815,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$363,000

\$726,000

\$462,532

\$3,366,532

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

					_		<u> </u>
		Mini Dr- Vallejo					
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	264,500.00	\$ 264,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	0	LS	\$	150,000.00	\$ -
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00
	8	Install Lighting	1	EA	\$	100,000.00	\$ 100,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$	500,000.00	\$ 500,000.00
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00
					_		

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
Construction Subtotal:									
	Design, Environmental and	Constructi	ion Ma	nage	ment (20%):	\$	611,900		
			Co	onting	ency (40%):	\$	1,223,800		
Escalation (3% for 5 years):									
					TOTAL:	\$	5,674,878		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		1st Street - Dixon				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$60,000	\$60,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	0	EA	\$100,000	\$0
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	0	EA	\$300,000	\$0
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Cons	truction Subtotal:	\$660,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$132,000

\$264,000

\$168,193

\$1,224,193

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

1 of Street Diven											
	1st Street - Dixon										
Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost					
1	Project Controls (10% of Construction)	1	LS	\$	169,500.00	\$ 169,500.00					
2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00					
3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00					
4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00					
5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00					
6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$	300,000.00	\$ -					
7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00					
8	Install Lighting	1	EA	\$	100,000.00	\$ 100,000.00					
9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -					
10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00					
11	Install 1 Track of Crossing Panels	1	EA	\$	75,000.00	\$ 75,000.00					
12	Install 2 Railroad Devices	2	EA	\$	250,000.00	\$ 500,000.00					
	Item No. 1 2 3 4 5 6 7 8 9 10 11 12	Ist Street - DixonItem No.Description1Project Controls (10% of Construction)2Remove concrete, asphalt, striping, utility adjustments3Install Roadway Elements4Install Medians/Channelization5Install 2 UPRR Access Gates6Install 2 Quadrants of Full Pedestrian Treatments7Install pavement markings and signage8Install Lighting9Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements10Railroad Removals11Install 1 Track of Crossing Panels12Install 2 Railroad Devices	Ist Street - DixonItem No.DescriptionQuantity1Project Controls (10% of Construction)12Remove concrete, asphalt, striping, utility adjustments13Install Roadway Elements14Install Medians/Channelization15Install 2 UPRR Access Gates26Install 2 Quadrants of Full Pedestrian Treatments07Install pavement markings and signage18Install Lighting19Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements011Install 1 Track of Crossing Panels112Install 1 Railroad Devices2	Ist Street - DixonItem No.QuantityUnit1Project Controls (10% of Construction)1LS2Remove concrete, asphalt, striping, utility adjustments1LS3Install Roadway Elements1LS4Install Medians/Channelization1LS5Install 2 UPRR Access Gates2EA6Install 2 Quadrants of Full Pedestrian Treatments0EA7Install pavement markings and signage1LS8Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements0LS10Railroad Removals1LS11Install 1 Track of Crossing Panels1EA12Install 2 Railroad Devices2EA	Ist Street - DixonItem No.QuantityUnit1Project Controls (10% of Construction)1LS\$2Remove concrete, asphalt, striping, utility adjustments1LS\$3Install Roadway Elements1LS\$4Install Medians/Channelization1LS\$5Install 2 UPRR Access Gates2EA\$6Install 2 Quadrants of Full Pedestrian Treatments0EA\$7Install pavement markings and signage1LS\$8Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements0LS\$10Railroad Removals1LS\$11Install 1 Track of Crossing Panels1EA\$12Install 2 Railroad Devices2EA\$	Item No.QuantityUnitUnit Cost1Project Controls (10% of Construction)1LS\$169,500.002Remove concrete, asphalt, striping, utility adjustments1LS\$100,000.003Install Roadway Elements1LS\$250,000.004Install Medians/Channelization1LS\$350,000.005Install 2 UPRR Access Gates2EA\$35,000.006Install 2 Quadrants of Full Pedestrian Treatments0EA\$300,000.007Install pavement markings and signage1LS\$100,000.008Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements0LS\$500,000.0010Railroad Removals1LS\$500,000.0011Install 1 Track of Crossing Panels1EA\$75,000.0012Install 2 Railroad Devices2EA\$250,000.00					

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00	
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00	
			Cons	structio	on Subtotal:	\$	2,014,500	
Design, Environmental and Construction Management (20%):								
			Co	ontinge	ency (40%):	\$	805,800	
Escalation (3% for 5 years):								
					TOTAL:	\$	3,736,572	

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Redwood Street - Vallejo (751466R)											
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost					
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$195,000	\$195,000					
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000					
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000					
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000					
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0					
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000					
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000					
	8	Install Lighting	0	EA	\$100,000	\$0					
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000					
	10	Railroad Removals	0	LS	\$50,000	\$0					
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0					
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000					
	13	Install Signal Cabin	0	EA	\$300,000	\$0					
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0					
				Cons	truction Subtotal:	\$2,145,000					

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$429,000

\$858,000

\$546,629

\$3,978,629

September 2023

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

		Redwood Street - Vallejo (751466R)				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 279,500.00	\$ 279,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$ 300,000.00	\$ 600,000.00
mataliations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00
	8	Install Lighting	1	EA	\$ 100,000.00	\$ 100,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$ 500,000.00	\$ 500,000.00
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$ 250,000.00	\$ 500,000.00
	-					

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
			Cons	struct	ion Subtotal:	\$	3,224,500		
	Design, Environmental and Construction Management (20%):								
			Co	onting	jency (40%):	\$	1,289,800		
Escalation (3% for 5 years):									
					TOTAL:	\$	5,980,927		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE September 2023 Valle Vista Avenue - Vallejo (751467X) Extended Cost Section Item No. Description Quantity Unit Unit Cost \$95,000 Project Controls Project Controls (10% of Construction) LS \$95,000 1 1 LS Demolition and Removals 2 Remove concrete, asphalt, striping, utility adjustments \$100,000 \$100,000 1 3 Install Roadway Elements LS \$250,000 \$250,000 1 4 Install Medians/Channelization LS \$150,000 0 \$35,000 5 Install 2 UPRR Access Gates 0 ΕA Install 2 Quadrants of Full Pedestrian Treatments \$300,000 6 0 ΕA Installations Install pavement markings and signage LS \$100,000 7 1 \$100,000 8 Install Lighting ΕA \$100,000 0 LS 9 \$500,000 Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements 1 \$500,000 \$50,000 10 Railroad Removals 0 LS 11 Install 1 Track of Crossing Panels ΕA \$75,000 0 **RR** Improvements 12 Install 2 Railroad Devices 0 ΕA \$250,000 ΕA \$300,000 13 Install Signal Cabin 0 Railroad Signal Design Allowance LS \$150,000 14 0 Construction Subtotal: \$1,045,000

Design, Environmental and Construction Management (20%): \$209,000

Contingency (40%): \$418,000 \$266,306

Escalation (3% for 5 years): TOTAL:

\$1,938,306

\$0

\$0

\$0

\$0

\$0 \$0

\$0

\$0

\$0

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

		Valle Vista Avenue - Vallejo (751467X)				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 179,500.00	\$ 179,500.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	0	LS	\$ 150,000.00	\$ -
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$ 300,000.00	\$ -
mstallations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00
	8	Install Lighting	1	EA	\$ 100,000.00	\$ 100,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$ 500,000.00	\$ 500,000.00
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	1	EA	\$ 75,000.00	\$ 75,000.00
RR Improvements	12	Install 2 Railroad Devices	1	ΕA	\$ 250,000.00	\$ 250,000.00

13	Install Signal Cabin	1	EA	\$	300,000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$	150,000.00	\$	150,000.00		
			Cons	struction	on Subtotal:	\$	2,124,500		
	Design, Environmental and Construction Management (20%):								
			Co	ontinge	ency (40%):	\$	849,800		
Escalation (3% for 5 years):									
					TOTAL:	\$	3,940,604		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		Fry Rd- Unincorporated				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$70,000	\$70,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$C
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$C
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$C
	10	Railroad Removals	0	LS	\$50,000	\$C
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$C
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$C
	13	Install Signal Cabin	0	EA	\$300,000	\$C
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$C
				Cons	truction Subtotal:	\$770,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$154,000

\$308,000

\$196,226

\$1,428,226

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

		Fry Rd- Unincorporated				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$ 187,000.00	\$ 187,000.00
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$ 100,000.00	\$ 100,000.00
	3	Install Roadway Elements	1	LS	\$ 250,000.00	\$ 250,000.00
	4	Install Medians/Channelization	1	LS	\$ 150,000.00	\$ 150,000.00
	5	Install 2 UPRR Access Gates	2	EA	\$ 35,000.00	\$ 70,000.00
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$ 300,000.00	\$ -
motaliations	7	Install pavement markings and signage	1	LS	\$ 100,000.00	\$ 100,000.00
	8	Install Lighting	2	EA	\$ 100,000.00	\$ 200,000.00
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$ 500,000.00	\$ -
	10	Railroad Removals	1	LS	\$ 50,000.00	\$ 50,000.00
	11	Install 1 Track of Crossing Panels	2	EA	\$ 75,000.00	\$ 150,000.00
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$ 250,000.00	\$ 500,000.00

13	Install Signal Cabin	1	EA	\$ 300,0	000.00	\$	300,000.00		
14	Railroad Signal Design Allowance	1	LS	\$ 150,0	000.00	\$	150,000.00		
			Cons	struction Su	ubtotal:	\$	2,207,000		
	Design, Environmental and	Constructi	on Ma	nagement ((20%):	\$	441,400		
			Co	ontingency ((40%):	\$	882,800		
Escalation (3% for 5 years):									
				т	OTAL:	\$	4,093,629		

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	TUDE					September 2023
		1st Street - Dixon				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$105,000	\$105,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	0	LS	\$150,000	\$C
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$C
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	0	EA	\$100,000	\$0
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$C
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$C
	13	Install Signal Cabin	0	EA	\$300,000	\$C
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0
				Const	truction Subtotal:	\$1,155,000

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL: \$231,000

\$462,000

\$294,338

\$2,142,338

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

	1st Street - Dixon												
Section	Item No.	Description	Quantity	Unit		Unit Cost	Extended Cost						
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$	212,000.00	\$ 212,000.00						
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$	100,000.00	\$ 100,000.00						
	3	Install Roadway Elements	1	LS	\$	250,000.00	\$ 250,000.00						
	4	Install Medians/Channelization	1	LS	\$	150,000.00	\$ 150,000.00						
	5	Install 2 UPRR Access Gates	2	EA	\$	35,000.00	\$ 70,000.00						
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$	300,000.00	\$ 600,000.00						
mataliations	7	Install pavement markings and signage	1	LS	\$	100,000.00	\$ 100,000.00						
	8	Install Lighting	1	EA	\$	100,000.00	\$ 100,000.00						
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$	500,000.00	\$ -						
	10	Railroad Removals	1	LS	\$	50,000.00	\$ 50,000.00						
	11	Install 1 Track of Crossing Panels	2	EA	\$	75,000.00	\$ 150,000.00						
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$	250,000.00	\$ 250,000.00						

	13	Install Signal Cabin	1	EA	\$ 3	300,000.00	\$	300,000.00
	14	Railroad Signal Design Allowance	1	LS	\$ 1	150,000.00	\$	150,000.00
				Cons	struction	n Subtotal:	\$	2,482,000
		Design, Environmental and	Constructi	ion Ma	nageme	ent (20%):	\$	496,400
				Co	ontingen	ncy (40%):	\$	992,800
Escalation (3% for 5 years):								
						TOTAL:	\$	4,603,709

PROPOSED CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGNITUDE Septer									
Pitt School Road - Dixon									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$60,000	\$60,000			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0			
	3	Install Roadway Elements	0	LS	\$250,000	\$0			
	4	Install Medians/Channelization	0	LS	\$150,000	\$0			
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0			
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000			
	8	Install Lighting	0	EA	\$100,000	\$0			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000			
	10	Railroad Removals	0	LS	\$50,000	\$0			
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0			
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0			
	13	Install Signal Cabin	0	EA	\$300,000	\$0			
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000			
				Cons	truction Subtotal:	\$810,000			
Design, Environmental and Construction Management (20%):									

Design, Environmental and Construction Management (20%): Contingency (40%): Escalation (3% for 5 years): TOTAL:

\$324,000

\$206,419

\$1,502,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE									
Dixon - Pitt School Road									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$237,000	\$237,000			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000			
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000			
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000			
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0			
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000			
	8	Install Lighting	2	EA	\$100,000	\$200,000			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000			
	10	Railroad Removals	1	LS	\$50,000	\$50,000			
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000			
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000			
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000			
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000			
				Const	truction Subtotal:	\$2,757,000			
		Design, Environmental and	Construction	on Ma	nagement (20%):	\$551,400			
Contingency (40%):									
Escalation (3% for 5 vears):									
TOTAL:									

ROUGH ORDER OF MAGN	TUDE					September 2023		
Midway Road - Unincorporated County								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$135,000	\$135,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments		LS	\$100,000	\$0		
	3	Install Roadway Elements	2	LS	\$250,000	\$500,000		
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000		
	5	Install 2 UPRR Access Gates		EA	\$35,000	\$C		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments		EA	\$300,000	\$0		
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	1	EA	\$100,000	\$100,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000		
	10	Railroad Removals		LS	\$50,000	\$0		
	11	Install 1 Track of Crossing Panels		EA	\$75,000	\$0		
RR Improvements	12	Install 2 Railroad Devices		EA	\$250,000	\$0		
	13	Install Signal Cabin		EA	\$300,000	\$C		
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
	Construction Subtotal: 20%):							

Contingency (40%): Escalation (3% for 5 years): **TOTAL:** \$654,000

\$416,661

\$3,032,661

FULL CROSSING IMPROVEMENTS

OUGH ORDER OF MAGNI	TUDE					September 2023		
Midway Road - Unincorporated County								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$262,000	\$262,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000		
	3	Install Roadway Elements	2	LS	\$250,000	\$500,000		
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000		
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0		
mataliationa	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	2	EA	\$100,000	\$200,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000		
	10	Railroad Removals	1	LS	\$50,000	\$50,000		
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000		
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000		
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000		
		Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
				Cons	truction Subtotal	: \$3,032,000		
		Design, Environmental ar	nd Construct	tion Ma	anagement (20%)	: \$606,400		
				C	ontingency (40%)	: \$1,212,800		
			Esc	calatior	n (3% for 5 years)	: \$772,670		
					TOTAL	: \$5,623,870		

ROUGH ORDER OF MAGN	ITUDE					September 2023				
Batavia Road - Unincorporated County										
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost				
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$60,000	\$60,000				
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0				
Installations	3	Install Roadway Elements	0	LS	\$250,000	\$0				
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000				
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0				
	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0				
	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000				
	8	Install Lighting	1	EA	\$100,000	\$100,000				
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0				
	10	Railroad Removals	0	LS	\$50,000	\$0				
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0				
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000				
	13	Install Signal Cabin	0	EA	\$300,000	\$0				
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000				
				Constru	uction Subtotal:	\$810,000				
		Design, Environmental and	Constructio	on Mana	agement (20%):	\$162,000				

Design, Environmental and Construction Management (20%): \$324,000

Contingency (40%):

Escalation (3% for 5 years): \$206,419

TOTAL: \$1,502,419

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGNITUDE						September 2023			
Batavia Road - Unincorporated County									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$187,000	\$187,00			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,00			
	3	Install Roadway Elements	1	LS	\$250,000	\$250,00			
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,00			
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,00			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$			
installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,00			
	8	Install Lighting	2	EA	\$100,000	\$200,000			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$			
	10	Railroad Removals	1	LS	\$50.000	\$50,000			

RR Improvements	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000
	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000
					truction Subtotal:	\$2,207,000

Design, Environmental and Construction Management (20%): \$441,400

Contingency (40%): \$882,800

\$562,429 Escalation (3% for 5 years):

TOTAL: \$4,093,629

ROUGH ORDER OF MAGN	ITUDE					September 2023			
Fox Road - Unincorporated County									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$70,000	\$70,000			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000			
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000			
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000			
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0			
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000			
	8	Install Lighting	1	EA	\$100,000	\$100,000			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$(
	10	Railroad Removals	0	LS	\$50,000	\$(
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$(
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$(
	13	Install Signal Cabin	0	EA	\$300,000	\$(
		Railroad Signal Design Allowance	0	LS	\$150,000	\$0			
				Const	ruction Subtotal:	\$770,000			
		Design, Environmental and	Construction	on Man	agement (20%):	\$154,000			
				~	(100())	* ***			

\$308,000

Contingency (40%): Escalation (3% for 5 years): \$196,226

TOTAL: \$1,428,226

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGN	ITUDE					September 2023			
Fox Road - Unincorporated County									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$187,000	\$187,000			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000			
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000			
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000			
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0			
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000			
	8	Install Lighting	2	EA	\$100,000	\$200,000			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0			
	10	Railroad Removals	1	LS	\$50,000	\$50,000			
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000			
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000			
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000			
		Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000			
				Constr	uction Subtotal:	\$2,207,000			

ROUGH ORDER OF MAGNITUDE

\$441,400 Design, Environmental and Construction Management (20%):

\$882,800 Contingency (40%):

Escalation (5% for 4 years) \$562,429

\$4,093,629 TOTAL:

ROUGH ORDER OF MAGN	ITUDE					September 2023			
Elmira Road - Unincorporated County									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$85,000	\$85,000			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$C			
	3	Install Roadway Elements	0	LS	\$250,000	\$C			
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000			
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$C			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$C			
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000			
	8	Install Lighting	1	EA	\$100,000	\$100,000			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000			
	10	Railroad Removals	0	LS	\$50,000	\$C			
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$C			
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$C			
	13	Install Signal Cabin	0	EA	\$300,000	\$C			
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000			
				Const	ruction Subtotal:	\$1,085,000			
		Design, Environmental and	d Constructi	on Mar	nagement (20%):	\$217,000			
				Coi	ntingency (40%):	\$434,000			

Escalation (3% for 5 years): TOTAL: \$276,500

\$2,012,500

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Elmira Road - Unincorporated County								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$222,000	\$222,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000		
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000		
	4	Install Medians/Channelization	0	LS	\$150,000	\$0		
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0		
mataliations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	2	EA	\$100,000	\$200,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000		
	10	Railroad Removals	1	LS	\$50,000	\$50,000		
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000		
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000		
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000		
		Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
				Constr	ruction Subtotal:	\$2,592,000		
		Design, Environmental and	d Constructi	on Man	agement (20%):	\$518,400		
				Con	itingency (40%):	\$1,036,800		
			Esca	alation (3% for 5 years):	\$660,541		
					TOTAL:	\$4,807,741		

ROUGH ORDER OF MAGNITUDE

East Tabor Avenue - Fairfield								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$85,000	\$85,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0		
	3	Install Roadway Elements	0	LS	\$250,000	\$0		
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000		
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$300,000	\$300,000		
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	0	EA	\$100,000	\$0		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0		
	10	Railroad Removals	0	LS	\$50,000	\$0		
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0		
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0		
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000		
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
				Const	truction Subtotal:	\$1,085,000		

Design, Environmental and Construction Management (20%): \$217,000

Contingency (40%): Escalation (3% for 5 years): TOTAL: \$434,000

\$276,500

\$2,012,500

FULL CROSSING IMPROVEMENTS

East Tabor Avenue - Fairfield							
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost	
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$207,000	\$207,000	
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000	
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000	
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000	
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000	
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	1	EA	\$300,000	\$300,000	
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000	
	8	Install Lighting	1	EA	\$100,000	\$100,000	
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0	
	10	Railroad Removals	1	LS	\$50,000	\$50,000	
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000	
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000	
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000	
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000	
				Constru	uction Subtotal:	\$2,277,000	
		Design, Environmental and	d Constructi	on Mana	agement (20%):	\$455,400	
				Con	tingency (40%):	\$910,800	
			Esc	alation	(5% for 4 years)	\$580,267	
					TOTAL:	\$4,223,467	

ROUGH ORDER OF MAGN	ITUDE					September 2023		
Pedestrian Xing (Solano Rail Hub)								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$80,000	\$80,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0		
	3	Install Roadway Elements	0	LS	\$250,000	\$0		
	4	Install Medians/Channelization	0	LS	\$150,000	\$0		
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000		
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	1	EA	\$100,000	\$100,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0		
	10	Railroad Removals	0	LS	\$50,000	\$0		
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0		
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0		
	13	Install Signal Cabin	0	EA	\$300,000	\$0		
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
				Const	ruction Subtotal:	\$1,030,000		
		Design, Environmental and	d Construction	on Man	agement (20%):	\$206,000		
				0	(100/)	#440.000		

Contingency (40%): Escalation (3% for 5 years): **TOTAL:** \$412,000 \$262,484

\$1,910,484

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Pedestrian Xing (Solano Rail Hub)								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$172,000	\$172,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0		
	3	Install Roadway Elements	0	LS	\$250,000	\$0		
	4	Install Medians/Channelization	0	LS	\$150,000	\$0		
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	2	EA	\$300,000	\$600,000		
mstallations	7	Install pavement markings and signage	0	LS	\$100,000	\$0		
	8	Install Lighting	1	EA	\$100,000	\$100,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0		
	10	Railroad Removals	0	LS	\$50,000	\$0		
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000		
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000		
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000		
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
		Decise Environmental and	Construction	Const	ruction Subtotal:	\$2,042,000 \$408,400		
		Design, Environmentar and	Constructio	Cor	ntingency (40%):	\$408,400 \$816,800		
			Esca	alation	(3% for 5 years):	\$520,380		
					TOTAL:	\$3,787,580		

ROUGH ORDER OF MAGN	TUDE					September 2023		
Chadbourne Road - Unincorporated County								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$75,000	\$75,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0		
	3	Install Roadway Elements	0	LS	\$250,000	\$0		
	4	Install Medians/Channelization	0	LS	\$150,000	\$0		
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0		
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	1	EA	\$100,000	\$100,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0		
	10	Railroad Removals	0	LS	\$50,000	\$0		
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$0		
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000		
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000		
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
	Construction Subtotal:					\$975,000		
		Design, Environmental and	d Construction	on Mar	agement (20%):	\$195,000		
		-		Cor	$\frac{1}{1000000}$	¢200.000		

Contingency (40%): Escalation (3% for 5 years): \$390,000

\$248,468 TOTAL:

\$1,808,468

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Chadbourne Road - Unincorporated County								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$159,500	\$159,500		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000		
	3	Install Roadway Elements	2	LS	\$250,000	\$500,000		
	4	Install Medians/Channelization	0	LS	\$150,000	\$0		
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0		
installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	2	EA	\$100,000	\$200,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0		
	10	Railroad Removals	0	LS	\$50,000	\$0		
	11	Install 1 Track of Crossing Panels	1	EA	\$75,000	\$75,000		
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000		
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000		
		Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
				Constr	ruction Subtotal:	\$1,904,500		
		Design, Environmental and	Construction	on Mana	agement (20%):	\$380,900		
Contingency (40%):								
Escalation (5% for 4 years)								
TOTAL:								

ROUGH ORDER OF MAGN	IITUDE					September 2023
		Canon Road - Fairfield				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$100,000	\$100,000
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0
	3	Install Roadway Elements	0	LS	\$250,000	\$0
	4	Install Medians/Channelization	0	LS	\$150,000	\$0
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	1	LS	\$500,000	\$500,000
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$C
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$0
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000
				Const	ruction Subtotal:	\$1,250,000
		Design, Environmental and	Constructio	on Man	agement (20%):	\$250,000
				Cor	tingency (40%)	\$500.000

 Contingency (40%):
 \$500,000

 Escalation (3% for 5 years):
 \$318,548

 TOTAL:
 \$2,318,548

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	ITUDE				September 2023			
Canon Road - Fairfield								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$272,000	\$272,00		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,00		
	3	Install Roadway Elements	1	LS	\$250,000	\$250,00		
	4	Install Medians/Channelization	0	LS	\$150,000	\$		
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,00		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$		
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,00		
	8	Install Lighting	2	EA	\$100,000	\$200,00		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	2	LS	\$500,000	\$1,000,00		
	10	Railroad Removals	1	LS	\$50,000	\$50,000		

						-
	11	Install 1 Track of Crossing Panels	2	EA	\$75,000	\$150,000
RR Improvements	12	Install 2 Railroad Devices	2	EA	\$250,000	\$500,000
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000
				Const	ruction Subtotal	\$3 142 000

Construction Subtotal: \$3,142,000

Design, Environmental and Construction Management (20%): \$628,400

Contingency (40%): \$1,256,800

Escalation (3% for 5 years): \$800,703

TOTAL: \$5,827,903

ROUGH ORDER OF MAGN	TUDE					September 2023
		Unincorporated - Rio Dixon Road				
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$117,500	\$117,500
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000
	4	Install Medians/Channelization	0	LS	\$150,000	\$0
Installations	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0
	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0
mstallations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000
	8	Install Lighting	1	EA	\$100,000	\$100,000
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0
	10	Railroad Removals	0	LS	\$50,000	\$0
	11	Install 1 Track of Crossing Panels	1	EA	\$75,000	\$75,000
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000
				Const	ruction Subtotal:	\$1,442,500
		Design, Environmental and	Construction	on Man	agement (20%):	\$288,500
				Cor	itingency (40%):	\$577,000
			Esca	alation (3% for 5 years):	\$367,605
					TOTAL:	\$2,675,605

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

Unincorporated - Rio Dixon Road								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$154,500	\$154,500		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000		
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000		
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000		
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,000		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$0		
mataliations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	2	EA	\$100,000	\$200,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0		
	10	Railroad Removals	1	LS	\$50,000	\$50,000		
	11	Install 1 Track of Crossing Panels	1	EA	\$75,000	\$75,000		
RR Improvements	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000		
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000		
	14	Railroad Signal Design Allowance	1	LS	\$150,000	\$150,000		
				Const	ruction Subtotal:	\$1,849,500		
		Design, Environmental and	l Constructi	on Man	agement (20%):	\$369,900		
				Con	itingency (40%):	\$739,800		
Escalation (3% for 5 years):								
TOTAL:								

ROUGH ORDER OF MAGN	ITUDE					September 2023		
Unincorporated - Red Top Road								
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost		
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$70,000	\$70,000		
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	0	LS	\$100,000	\$0		
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000		
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,000		
	5	Install 2 UPRR Access Gates	0	EA	\$35,000	\$0		
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$C		
Installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000		
	8	Install Lighting	2	EA	\$100,000	\$200,000		
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$0		
	10	Railroad Removals	0	LS	\$50,000	\$C		
	11	Install 1 Track of Crossing Panels	0	EA	\$75,000	\$C		
RR Improvements	12	Install 2 Railroad Devices	0	EA	\$250,000	\$C		
	13	Install Signal Cabin	0	EA	\$300,000	\$0		
	14	Railroad Signal Design Allowance	0	LS	\$150,000	\$0		
		Design Environmental and	Construction	Constr	uction Subtotal:	\$770,000		

\$154,000 Design, Environmental and Construction Management (20%): \$308,000

Contingency (40%):

Escalation (3% for 5 years): \$196,226

TOTAL: \$1,428,226

FULL CROSSING IMPROVEMENTS

ROUGH ORDER OF MAGNITUDE

ROUGH ORDER OF MAGN	ITUDE				September 2023				
Unincorporated - Red Top Road									
Section	Item No.	Description	Quantity	Unit	Unit Cost	Extended Cost			
Project Controls	1	Project Controls (10% of Construction)	1	LS	\$149,500	\$149,500			
Demolition and Removals	2	Remove concrete, asphalt, striping, utility adjustments	1	LS	\$100,000	\$100,000			
	3	Install Roadway Elements	1	LS	\$250,000	\$250,000			
	4	Install Medians/Channelization	1	LS	\$150,000	\$150,00			
	5	Install 2 UPRR Access Gates	2	EA	\$35,000	\$70,00			
Installations	6	Install 2 Quadrants of Full Pedestrian Treatments	0	EA	\$300,000	\$			
installations	7	Install pavement markings and signage	1	LS	\$100,000	\$100,000			
	8	Install Lighting	2	EA	\$100,000	\$200,000			
	9	Install Signal Preemption, Traffic Signals/Queue Cutter and Associated Improvements	0	LS	\$500,000	\$			
	10	Railroad Removals	0	LS	\$50,000	\$			

RR Improvements	11	Install 1 Track of Crossing Panels	1	EA	\$75,000	\$75,000
	12	Install 2 Railroad Devices	1	EA	\$250,000	\$250,000
	13	Install Signal Cabin	1	EA	\$300,000	\$300,000
	14	Railroad Signal Design Allowance		LS	\$150,000	\$150,000
				Const	ruction Subtotal:	\$1,794,500

Construction Subtotal: Design, Environmental and Construction Management (20%): \$358,900

Contingency (40%): \$717,800

Escalation (3% for 5 years): \$457,308

TOTAL: \$3,328,508 **APPENDIX E – FUNDING OPPORTUNITIES TABLE**





Grant	Grant Administering	Available Funding	Max/Min	Match Requirements	Special Considerations/	Eligible Projects	Date				
	Agency	Ŭ	Award Amount		Requirements						
Federal Funding Sources											
Railway Highway Grade Crossings (Section 130) Program	Federal Highway Administration (FHWA), California Department of Transportation (Caltrans), California Public Utilities Commission (CPUC)	~ \$17 million per year	Determined based on agreed upon scope	10% Local Match – Fulfilled through Caltrans STP Fund	Project must be on the CPUC Priority List Included in FSTIP Existing accident history, vehicle and train volumes, pedestrian issues, and geometry	Traffic signalization/Railro ad preemption Guardrails Pedestrian/Bicycle Path Improvements Active Warning Equipment	Annual				
Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program	Federal Railroad Administration (FRA), Department of Transportation (USDOT)	FY 22 \$1.4 billion available in funding	None	20% minimum local match – can include state or private entity funds	Preference is given to federal requests less than 50% of project cost Benefit-Cost Analysis (BCA) is required	A highway-rail grade crossing improvement project such as railroad crossing signals, gates, and related technologies, highway lighting					

Table 1 - Grant Funding Opportunities



Grant	Grant Administering Agency	Available Funding	Max/Min Award Amount	Match Requirements	Special Considerations/ Requirements	Eligible Projects	Date
						and crossing approach signage Road improvements, railroad crossing panels and surfaces	
Nationally Significant Multimodal Freight & Highway Projects Program (INFRA)	USDOT	FY 22 \$3.1 billion, FY 22 – FY 26 \$8 billion available	Up to \$50 million	20% minimum non- federal match, 80% maximum federal cost share	Projects are evaluated based on outcome criteria that includes safety, state of good repair, economic impacts, climate change, and equity Historically Disadvantaged Communities and Areas of Persistent Poverty are considered in the selection criteria BCA is required	A highway-railway grade crossing or grade separation project Network of project such as a rail corridor that increase rail safety and reduce congestion	Annual

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Grant	Grant Administering Agency	Available Funding	Max/Min Award Amount	Match Requirements	Special Considerations/ Requirements	Eligible Projects	Date
Railroad Crossing Elimination Grant Program	FRA	FY 22 \$573 million available	Minimum \$1 million, no maximum	20% minimum non- federal match, 80\$ maximum federal cost share	Funding request can combine proposed safety improvements at various at-grade crossing locations as corridor-wide improvement to region	Improvement or Installation of protective devices, signals, signs or other measures that improve safety Includes Planning, environmental review, and design of an eligible project	
			State	e Funding Sources			
State Rail Assistance (SRA) Program	California State Transportation Agency (CalSTA)	~\$454 million over the first 10 years of SB 1	Based on distribution formula per rail agency	None	Environmental documentation must be complete Funding request is made through an Allocation Request form	Transportation planning and mass transportation purposes Operations and capital improvements that provide benefit to the public	Annual



Grant	Grant Administering Agency	Available Funding	Max/Min Award Amount	Match Requirements	Special Considerations/ Requirements	Eligible Projects	Date
Trade Corridor Enhancement Program (TCEP)	California Transportation Commission (CTC)	~\$300 million per year from SB 1 and ~\$515 million over 3 years in National Highway Freight Program funds	Distribution is on a corridor basis	30% match requirement from either private, local, federal or state funds. If project is nominated by Caltrans, no match is required.	Elevation criteria includes freight system, transportation, and community factors and overall benefits and cost of the project	Freight rail system improvements, surface transportation, local road, and connector road improvements to facilitate the movement of goods	Annual
State Transportation Improvement Program (STIP)	Caltrans, Metropolitan Transportation Commission (MTC), CTC	Each county is designated an amount of STIP funding	Varies	None	Project proposals must align with goals of Plan Bay Area 2050, region's transportation and land-use priorities CTC will have final approval of project proposals submitted by MTC for Regional Transportation Improvement Program (RTIP) and by Caltrans for the Interregional Transportation	Transit and Rail Projects programmed in the RTIP Bicycle and Pedestrian projects programmed in the STIP and eligible for federal funds	Annual



Grant	Grant Administering Agency	Available Funding	Max/Min Award Amount	Match Requirements	Special Considerations/ Requirements	Eligible Projects	Date
					Improvement Program (ITIP)		

	Regional Funding Sources									
Transportation Development Act (TDA)	MTC	Amount available fluctuates based on sales tax on fuel and diesel fuel	Funding is requested through an allocation form based on a Fund Estimate prepared by MTC released in the beginning of the year	None	Available funds through the Local Transportation Fund (LTF) are determined annually.	Transit Operations Bus and rail projects Pedestrian and bicycle facilities Transportation planning	Monthly			
			Loca	l Funding Sources						
Regional Traffic Impact Fee (RTIF)	Solano County Board of Supervisors	Varies	Varies	None	5% of funds are allocated to regional transit improvements through Solano County's Public Facility Fee (PFF)	Transportation projects	n/a			

