



# Quiet Zone Feasibility Study

**Draft Report**



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# Quiet Zone Feasibility Study

## City of Morgan Hill

Draft Report

May 25, 2017



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## Executive Summary

A study analyzing the feasibility of creating a railroad crossing “Quiet Zone” in the City of Morgan Hill was performed. This study included the railroad corridor with the following at-grade highway-rail crossings (at-grade crossing): East Dunne Avenue, Morgan Hill Train Station Pedestrian Crossing, East Main Avenue, and Tilton Avenue.

These at-grade crossings were analyzed with the Federal Railroad Administration’s Grade Crossing Risk Calculator. In this analysis, the risk was shown to be lower than the Risk Index With Horns with the installation of Constant Warning Time (CWT) signaling and automatic crossing gates at the Morgan Hill Train Station Pedestrian Crossing, and other enhancements at each of the three roadway crossings. This is due to the requirement that an at-grade crossing in a Quiet Zone must be equipped with automatic gates, CWT, and Power-On Indicators. Each at-grade crossing have Power-On indicators, but does not have CWT.

The establishment of a Quiet Zone will require a General Order 88-B Modification of Existing Crossing Application (G.O. 88-B) with the California Public Utilities Commission (CPUC). As part of the Quiet Zone process, a field diagnostic meeting with the City, CPUC, and Union Pacific Railroad will be required. Should the City move forward with the Quiet Zone process, a G.O. 88-B application will be filed with the CPUC. It is likely that additional requirements will be set forth in the diagnostic meeting for the implementation of a Quiet Zone. As a result, the following scenario was developed for the Quiet Zone enhancements:

- Includes the following:
  - Install CWT at all at-grade crossings,
  - Install pedestrian gates at the Morgan Hill Train Station Pedestrian Crossing,
  - Install pedestrian treatments at East Dunne Avenue, East Main Avenue, and Tilton Avenue, and
  - Install automatic exit gates at East Main Avenue and Tilton Avenue.

Conceptual drawings showing the enhancements were developed. In addition, conceptual costs of the scenario was developed.

Upon approval of the City Council, the next steps for this program are to conduct field diagnostic meetings with the CPUC and the Union Pacific Railroad to determine what enhancements are desired at each at-grade crossing.

## Introduction

### Background

The Union Pacific Railroad (UP) Coast Subdivision goes through the City of Morgan Hill. This track carries UP freight trains, Amtrak Coast Starlight long distance passenger trains, and Caltrain commuter trains. This mainline track is adjacent to commercial and residential development, including existing and in-construction multi-family dwellings. There have been a series of concerns regarding the increasing train horn noise related to the at-grade crossings of East Dunne Avenue, East Main Avenue, and Tilton Avenue and compatibility with urban development patterns.

Due to the increased awareness of trains and safety, the Morgan Hill City Council discussed applying for grants and the establishment of a Quiet Zone in May 2015. In January of 2017, the City Council elected to begin a study of the feasibility of establishing a Quiet Zone in the corridor defined by the at-grade crossings of East Dunne Avenue, Morgan Hill Train Station Pedestrian Crossing, East Main Avenue, and Tilton Avenue. This study examined the feasibility of the Quiet Zone in addition to safety enhancements that could be implemented at the at-grade crossings. This is in consideration of the additional expected pedestrian traffic due to the proximity of the residential developments.

Each of the at-grade crossings within the Quiet Zone are referred to as at-grade highway-railroad crossings (at-grade crossing). With these types of crossings the roadway is not separated from the railroad tracks. At-grade crossings usually include warning devices such as automatic gates, signals, bells, train horns, and signage to warn motorists and pedestrians of approaching trains. In the instance of a Quiet Zone, additional devices are installed to minimize the risk associated with accidents at the at-grade crossing and the train horns are eliminated, except in the case of an emergency.

### Train Horn Rule

In 2005, the Federal Railroad Administration (FRA) established a rule regarding the use of train horns at highway-rail at-grade crossings<sup>1</sup>, Code of Federal Regulations, Title 49, Part 222 - Use of Locomotive Horns at Public Highway-Rail Grade Crossings). This rule describes the instances of train horn use at at-grade crossings in addition to the methods of blowing the horn. Furthermore, the rule established the process and conditions of situations where the use of horns can be excluded – No Train Horn Rule. This led to the establishment of Quiet Zones where the use of train horns is banned unless in emergency cases where the train engineer is empowered to blow the horn. The rule defined the development of a quiet zone at an at-grade crossing, or within a rail corridor consisting of more than one at-grade crossing.

Quiet Zone approval at at-grade crossings falls into two categories, 1) automatic approval and 2) the establishment of a new quiet zone. New at-grade crossings can qualify with the addition of Secondary Safety Measures (SSM) and, if necessary, Alternative Safety Measures (ASM). Quiet Zones are established through a comparison of the existing risk at the at-grade crossing with the Nationwide Significant Risk Threshold (NSRT) and the Risk Index With Horns (RIWH). During the comparison, scenarios are developed that apply SSMs and ASMs as necessary to reduce the risk index.

The establishment of a Quiet Zone involves enhancing the safety as well as reducing the risk at the at-grade crossing. The FRA has established the following to reduce the risk at at-grade crossings within the Quiet Zone:

- Supplementary Safety Measures (SSMs) – SSMs include the following:
  - four-quadrant gates – gates installed so that the entire roadway is covered in both directions with an automatic gate arm,

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<sup>1</sup> This regulation can be accessed through <http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=d989a71c879798a8b356d4b23364e5ad&mc=true&n=pt49.4.222&r=PART&ty=HTML>

- non-traversable medians at least 100 feet long or mountable medians with traffic channelization devices, and
- permanent closure of the at-grade crossing.
- Alternative Safety Measures (ASMs) – ASMs include the following
  - programmed enforcement,
  - partial closure of the at-grade crossing,
  - public education,
  - planned enforcement,
  - photo enforcement, and
  - engineering methods of reducing risk, such as adjusting the at-grade crossing geometry to increase sight distance.

In addition, the Quiet Zone must have the following:

- Constant Warning Time – A railroad signal system for the operation of the at-grade crossing automatic warning devices. Constant Warning Time (CWT) is a motion sensing system that measures train speed and provides uniform warning time to the public at at-grade crossings. The benefit is that the at-grade crossing signals will always operate with the same timing, regardless of the speed of the train.
- Automatic Gates and Flashing Lights – Automatic gates installed at each at-grade crossing in the Quiet Zone.
- Power-Out Indicator – This is a signal light located on the signal house which indicates to railroad personnel that there is power at the at-grade crossing. The light is not lit when there is no commercial power at the at-grade crossing. Power-Out indicators are standard on UP signal houses.
- The Quiet Zone must be a minimum of one-half mile long.

## Highway - Railroad At-Grade Crossing Devices

Highway - Railroad at-grade crossings usually utilize automatic gates at the entrance of the at-grade crossing to restrict vehicles from entering the crossing zone. These are operated by railroad signaling circuits that detect train presence at a specific interval from the at-grade crossing, designed according to the timetable speed of the train. With the development of a Quiet Zone, additional enhancements are sometimes installed in order to reduce the risk associated with an at-grade crossing.

### i. Signaling

Railroad signaling is an integral part of at-grade crossing warning devices. Signaling controls the actions of the automatic gates as well as interconnects with any traffic signals at intersections affected by the at-grade crossing.

#### *Constant Warning Time*

The installation of Constant Warning Time (CWT) is necessary in any Quiet Zone. With CWT the track circuit senses train movement and speed and applies this logic to the at-grade crossing device controller. This motion sensing system prevents excessive gate down time and, consequently, the tendency for motorists to drive around gates when they are down for an excessive amount of time.

### *Preemption*

Preemption is the interconnection between traffic signals and the at-grade devices. Preemption can either be advanced or simultaneous. This system provides a signal to the traffic light controller through an interconnection with the railroad signaling system, indicating that a train is approaching the at-grade crossing. The traffic signals, working in concert with the at-grade devices, will provide signaling to motorists at the at-grade crossing.

### ii. Supplemental Safety Measures (SSMs)

SSMs fall into two main categories – signals and civil infrastructure. The minimization of the opportunity to drive around down gates is a consideration with at-grade crossings. In a Quiet Zone there are three major methods that minimize this tendency – exit gates, medians or channelization, and CWT.

#### *Exit Gates*

Exit gates are installed along the roadway where the vehicle exits the at-grade crossing zone. These are part of a four-quadrant gate system. Exit gates effectively prevent vehicles traveling in the wrong direction on the roadway from entering the at-grade crossing when the gates are down and minimize the opportunities to drive around the entrance gate. The four-quadrant gate system operates as follows:

1. Through advance warning the entrance gate lowers.
2. The exit gate then lowers after the vehicle detection system has determined that the at-grade crossing is clear.

#### *Raised Medians and Channelization*

Another option available for consideration as an SSM are raised medians or channelization. A raised median with unmountable curbs is a significant deterrence to gate drive arounds. In addition, channelization can be used as a method of controlling this behavior. An example is shown in Figure 1. Each of these must be a minimum of 100 feet long in order to qualify as an SSM.



*Figure 1: Roadway Channelization*

### iii. Alternate Safety measures (ASMs)

ASMs are utilized when there is no opportunity to reduce risk through traditional methods, or the installation of SSMs does not adequately reduce the risk. These methods involve several different methods of mitigation that are developed to reduce risk.

#### *Programmed Enforcement*

A policy of enhanced enforcement of traffic laws at the at-grade crossing. This involves active policing.

#### *Partial Closure of the At-Grade Crossing*

The at-grade crossing can be closed for certain periods during a 24-hour period to reduce risk. For example, the at-grade crossing could be closed at night, eliminating the opportunity for vehicle - train collisions during the period of closure.

#### *Public Education*

An official public outreach campaign to inform and educate about at-grade crossings and the subject at-grade crossing in particular.

#### *Photo Enforcement*

The installation of cameras at the at-grade crossing to enforce traffic laws.

#### *Engineering Methods*

Engineering methods may also be used as an ASM. This would include reconstructing the profile of the roadway to reduce an at-grade crossing hump or other means to increase sight distance at the at-grade crossing.

#### iv. Pedestrian Treatments

The presence of pedestrians at an at-grade crossing requires additional considerations. In many cases, the same methods used for vehicles are also used for pedestrians. While not part of the specified treatments necessary for a Quiet Zone, it should be noted that the California Public Utilities Commission (CPUC) and the railroads are looking closer at pedestrian access at at-grade crossings and implementing additional means to control this access. In cases where there is the required diagnostic inspection involving the railroad and the CPUC, there are often suggestions to add pedestrian enhancements that will reduce the risk at the at-grade crossing. These enhancements are shown in Figure 2 and described below.



*Figure 2: Pedestrian Treatments*

***Pedestrian Gates*** These automatic gates are mounted on separate masts, rather than the vehicle gates, and span the sidewalk at all quadrants of the at-grade crossing, restricting pedestrian access. These automatic gates are activated through the railroad signaling system.

#### ***Pedestrian Channelization***

Pedestrian channelization includes modified sidewalks, striping, and railings. Through this channelization, the pedestrian is effectively guided through the at-grade crossing.

#### ***Pedestrian Swing Gates***

In addition to the automatic gates, swing gates are also installed at pedestrian at-grade crossings. These gates open out, away from the track, and provide a means of exiting the at-grade crossing zone should a pedestrian get caught behind a down gate. An example is shown in Figure 3.



*Figure 3: Pedestrian Swing Gate*

### **The Quiet Zone Process**

A quiet zone can be established by a public agency, having jurisdiction over the roadway using one of two methods: Public Authority Designation or Public Authority Application to the FRA.

#### **i. Public Authority Designation**

A public authority may designate a Quiet Zone when each highway-rail at-grade crossing within the Quiet Zone complies with one or more FRA approved measures. The installation of SSMS reduces the risk at the at-grade crossing to below the NSRT or the RIWH. The FRA approved safety measures include:

- installation of four-quadrant gates,
- power-on indicators,
- constant warning time circuitry,
- installation of non-traversable medians of at least 100 feet in length, or
- full or partial closure of the at-grade crossing. Full closure can be through the construction of a grade separation or closure of the at-grade crossing. Partial closure restricts usage, usually at night, of the at-grade crossing.

#### **ii. Public Authority Application to the FRA**

This method involves the use of ASMs to reduce the risk at the at-grade crossing. This includes the following:

- four-quadrant or two-quadrant gates that do not meet SSM standards for a Quiet Zone,
- non-engineering ASMs such as programmed enforcement and photo enforcement, or



- engineering ASMs such as at-grade crossing geometry modifications.

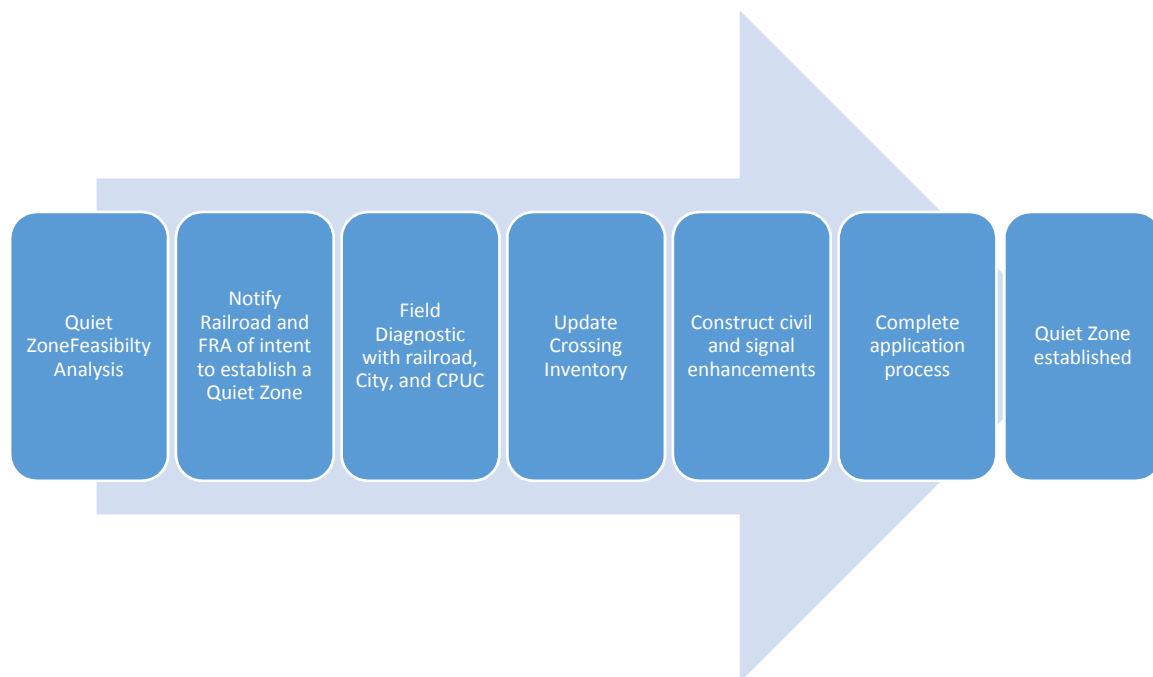
A Quiet Zone is created through a calculation of the risk associated with the at-grade crossing through the FRA Quiet Zone Risk Calculator. The at-grade crossings that are to be part of the Quiet Zone are entered into the calculator, which then loads the federal crossing inventory information.

The at-grade crossing inventory is completed by the railroad and updated regularly and contains the following information:

- street name, city and railroad,
- signal equipment,
- number of daily trains,
- physical characteristics of the roadway, and
- average daily traffic.

From this information the NSRT and RIWH is determined within the calculator. Once these are obtained, then the user will add SSMs to reduce the risk to an acceptable level.

Figure 5 is a flow chart outlining the steps necessary for the creation of a Quiet Zone. These steps are based on the NSRT and RIWH at each at-grade crossing. If there is a single at-grade crossing that has a higher risk in the Quiet Zone, the cumulative total will reduce the overall risk to the threshold numbers. A broad overview of the process to establish a Quiet Zone is shown in Figure 4.



*Figure 4: Quiet Zone Process*



## Chart 2 - Creating a New Quiet Zone using SSMs

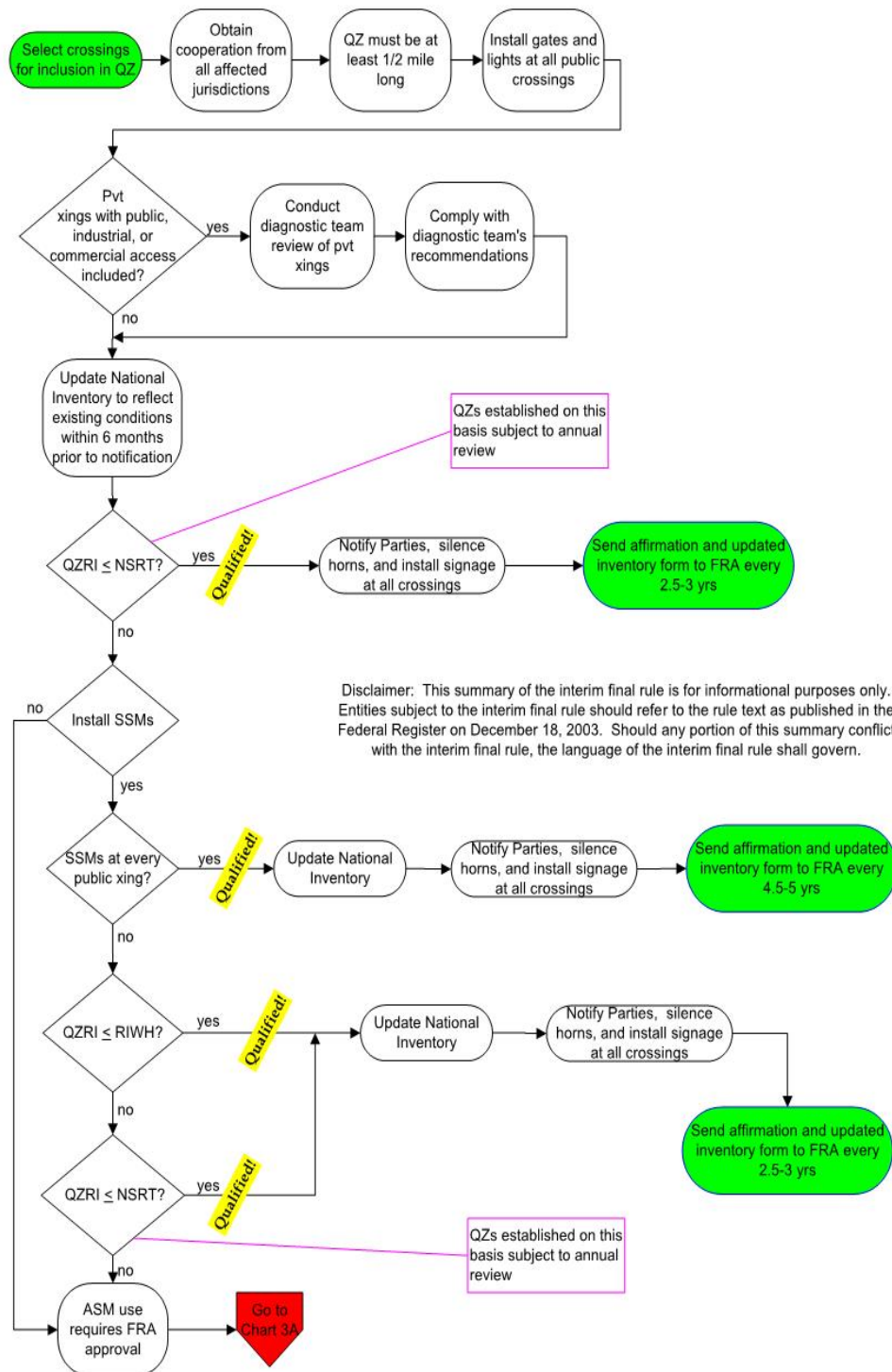


Figure 5: Quiet Zone Flow Chart

Source: FRA

## Existing Conditions

### Overview

The railroad right of way consists of a single mainline track that is owned, operated, and maintained by the UP. The railroad right of way is approximately 50 feet wide. The alignment is generally straight through the corridor considered for the Quiet Zone. While the visibility along the railroad is appropriate, there are buildings within the city that shorten the sight distance relative to the sidewalks. The length of the corridor being considered for the Quiet Zone is approximately 2.5 miles.

### Railroad Operations

The proposed Quiet Zone has traffic from three different railroads; Amtrak, Caltrain, and UP. The operations for these railroads are shown in Table 1.

*Table 1: Railroad Operations*

	Amtrak Coast Starlight	Caltrain	Union Pacific Railroad
Trains per day	2 – 1 each northbound and southbound	3 – northbound	7
Time of Trains	During the day	Morning Peak	Throughout a 24-hour period
Typical Train Length	700 feet	700 feet	7000 – 8000 feet (lengths vary)
Maximum Timetable Speed	79 mph	79 mph	60 mph
Typical Speeds	30 mph to 60 mph	30 mph to 60 mph	30 mph to 60 mph
Train Horn Rules	GCOR <sup>2</sup>	GCOR	GCOR

The frequency and amount of daily trains can increase in the future, although the numbers are not known at this time.

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<sup>2</sup> GCOR refers to the General Code of Operating Rules. This can be found at:  
[http://1405.utu.org/Files/%5B4886%5DBNSF-GCOR%202011-08-01\\_gcor\\_updated.pdf](http://1405.utu.org/Files/%5B4886%5DBNSF-GCOR%202011-08-01_gcor_updated.pdf)

## At-Grade Crossing Information

### East Dunne Avenue

#### i. Environment

The at-grade crossing is located in a light urban environment. This is a commercial/residential area. There are commercial buildings on the north side of the road. There are multi-family rental and ownership dwellings on the south side of the roadway. This at-grade crossing is utilized by pedestrians as well as motor vehicles.



*Figure 6: East Dunne Avenue Looking East*

#### ii. Characteristics

East Dunne Avenue is a four-lane roadway, two in each direction, oriented east–west. The eastbound and westbound traffic lanes are separated by an un-mountable curbed median that extends for approximately 350 feet on the western approach and approximately 640 feet on the eastern approach. Each side of the street has a sidewalk that extends over the railroad at-grade crossing. The railroad at-grade crossing is constructed with rubber crossing panels that appear to need repair. The roadway is straight, offering significant sight distance in both directions. There is not a pronounced hump at the at-grade crossing. The traffic count is 15,000 vehicles per day (source: USDOT Crossing Inventory). The inventory for the at-grade crossing is attached in Appendix B - U.S. DOT Crossing Inventory Reports.

The existing at-grade crossing utilizes the following:

- 2 – No. 9 Gate with Flashing Signals each direction. One mounted in the median, the other behind the curb face. These at-grade crossing gates have backlights,
- W-10 advance warning signs,
- Pavement markings, and
- Power-On indicator.

#### iii. Accident History

There were two accidents at the East Dunne Street at-grade crossing. The accident reports are shown in Appendix C – At-Grade Crossing Accident Data.

- 1976 – A truck moving over the at-grade crossing struck rail equipment. There were no injuries or fatalities reported.
- 1978 – A car that was stopped on the at-grade crossing was struck by a freight train. There were no injuries or fatalities reported.

## Morgan Hill Train Station Pedestrian At-Grade Crossing

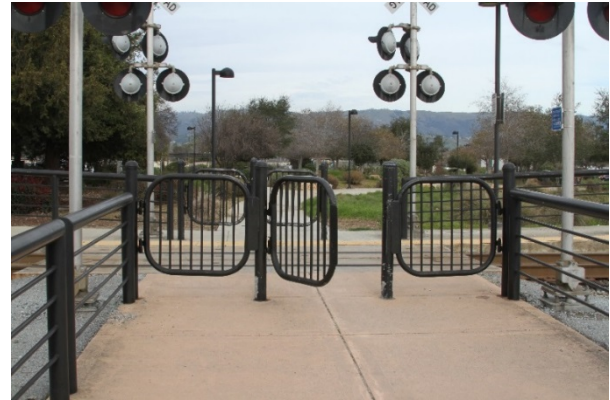
### i. Environment

The Morgan Hill Train Station Pedestrian At-Grade Crossing is located near a small community park. Parking and a restaurant are located on the west side of the tracks.

### ii. Characteristics

The Morgan Hill Train Station Pedestrian At-Grade Crossing is located at the southern end of the single track. This is a concrete crossing with tactile warning indicators on one side of the gates. The FRA inventory report for this at-grade crossing is shown in Appendix B - U.S. DOT Crossing Inventory Reports. The devices in place are:

- 4 – No. 8 Flashing Signal, two each direction,
- 4 – Pedestrian Swing Gates, two each direction, and
- Power-On indicator



*Figure 7: Morgan Hill Train Station Pedestrian At-Grade Crossing Looking East*

### iii. Accident History

There are no accidents reported at this pedestrian at-grade crossing.

## East Main Avenue

### i. Environment:

East Main Avenue is an east-west running street located in downtown Morgan Hill. This is a commercial and residential area. A multi-family structure is located in the northeast quadrant. In addition, another multi-family dwelling is under construction at the at-grade crossing in the southwest quadrant. There are several utility poles located along the sidewalk on the southern side of the at-grade crossing that will be placed underground with the construction of the structure, increasing visibility of at-grade crossing devices. South of the at-grade crossing are townhomes and condominiums.



*Figure 8: East Main Avenue Looking West*

ii. Characteristics:

East Main Avenue is a two-lane plus bike lane roadway; one traffic lane and one bike lane in each direction. The at-grade crossing utilizes concrete crossing panels. There are sidewalks on each side of the street. The roadway is oriented east–west. On the southern side of the at-grade crossing there is a 40-foot median on the approach to the at-grade crossing. In addition, there is a median on the east approach to the at-grade crossing that is wide at the at-grade crossing and narrows to approximately 12 inches in width. There is a driveway to a multi-family townhome complex located approximately 55 feet from the at-grade crossing on the eastbound lane. The FRA inventory report for this at-grade crossing is shown in Appendix B - U.S. DOT Crossing Inventory Reports. The devices in place are:

- 2- No. 9 Gate with Flashing Signals, one each direction,
- W-10 advance warning signs,
- pavement markings, and
- Power –On indicator.

iii. Accident History

There is no accident history at the Main Avenue at-grade crossing.

## Tilton Avenue

i. Environment

The Tilton Avenue at-grade crossing is located in a suburban residential area with single family dwellings nearby. There is a paved bike/pedestrian path within the railroad right of way, located on the eastern side of the single railroad track that is connected to the sidewalk at the at-grade crossing.

ii. Characteristics

Tilton Avenue is a two-lane roadway that is oriented east–west. The at-grade crossing is approximately 50 feet from the intersection of Tilton Avenue and Monterrey Road, a signal controlled intersection. There is a dedicated left turn onto Tilton Avenue from Monterrey Road. At the at-grade crossing, the eastbound lane becomes a dedicated left turn lane and a right turn lane. The at-grade crossing utilizes concrete panels. The at-grade crossing inventory is shown in Appendix B - U.S. DOT Crossing Inventory Reports. The warning devices in place at the at-grade crossing are:

- 1 – No. 9-A gate and cantilever signal,
- 1 – No. 9 gate and signal,
- W-10-1 advanced warning signs,
- advance warning of intersection signs,



Figure 9: Tilton Avenue Looking East

- pavement markings, and
- Power-On indicator.

### iii. Accident History

There was a single accident at Tilton. The accident occurred many years before the new intersection improvements were constructed report is attached in Appendix C – At-Grade Crossing Accident Data.

- 2006 – Amtrak train struck a truck that had driven around a crossing gate. The driver of the truck was killed.

## Risk Analysis

The four at-grade crossings were analyzed using the FRA Quiet Zone Risk Calculator. The risk calculator takes the existing at-grade crossing inventory data along with configuration data and calculates the risk. The user has an opportunity to update the inventory data for the crossing through this risk calculator.

No modifications of the existing configuration data were proposed with two exceptions. In order to have a Quiet Zone, each at-grade crossing must have automatic gates. The pedestrian at-grade crossing at the Morgan Hill Train Station utilizes swing gates. In order to calculate the risks associated with the Quiet Zone, it was assumed that automatic pedestrian gates are in place at this at-grade crossing

The second exception concerns the railroad signaling and the warning devices at the at-grade crossing. In order to qualify for a Quiet Zone, the at-grade crossings must be equipped with Constant Warning Time (CWT) signal connections. This is a motion detecting system that measures train speed and provides relatively uniform warning time to the public traffic at the at-grade crossing.

The scenario discussed in the following section was analyzed for risk. The scenario is based on analysis of the Quiet Zone Calculator results using the flowchart in Figure 5.

The FRA Quiet Zone Calculator Report is shown in Appendix D - Quiet Zone Calculator Results.

Table 2 shows the risk indices for the analyzed scenario. This scenario indicates that the QZRI is below the NSRT. Under this scenario, the corridor would qualify as a Quiet Zone.

*Table 2: Quiet Zone Risk Calculation*

Individual At-Grade Crossing Index		Risk Index
East Dunne Avenue		37,016.64
Morgan Hill Train Station Pedestrian At-Grade Crossing		144.28
East Main Avenue		7,231.32
Tilton Avenue		1,857.81

Quiet Zone Indices (Corridor)		Risk Index
Risk Index With Horns (RIWH)		38,527.46
Quiet Zone Risk Index (QZRI)		11,562.51
National Significant Risk Threshold (NSRT)		14,347.00



## Scenario

Any proposed modification of an at-grade crossing; warning devices, signal system, or civil infrastructure will require action by the CPUC, the regulator of railroad crossings, and the UP. In order to enact modifications, a field diagnostic must be performed that includes the City, UP, and the CPUC. From this diagnostic, the required modifications to the at-grade crossing will be determined. Once the City has decided to move forward with any enhancements to the crossing, a G.O. 88-B application will be filed with the CPUC for authority to modify the at-grade crossing(s). The G.O. 88-B outlines the final configuration of the at-grade crossing and demonstrates concurrence of the proposed modifications by the affected parties, including the railroad.

Due to the requirements of the CPUC regarding the regulations in place concerning at-grade crossings, there are two scenarios for establishing a Quiet Zone at these four at-grade crossings. Each requires the installation of CWT at each at-grade crossing and pedestrian gates at the Morgan Hill Train Station Pedestrian At-Grade Crossing.

It should be noted that this scenario represents a range of options that can be employed at the at-grade crossing and was developed absent of a diagnostic meeting with the CPUC and the railroad.

### *Scenario:*

The requirement of the installation of CWT in the at-grade crossing circuitry will trigger action by the CPUC and the UP. It is possible that additional at-grade crossing enhancements over and above the minimum will be required by the UP and the CPUC in order to develop the Quiet Zone. Based on experience, the following may be required:

#### a. East Dunne Avenue

As discussed above, East Dunne Avenue has a long, un-mountable curbed median on both approaches to the at-grade crossing meeting the minimum 100-foot required length. Therefore four-quadrant gates are not necessary to prevent drive arounds. The enhancements in this scenario include:

- automatic pedestrian gates, swing gates, and associated channelization installed on each sidewalk, and
- Constant Warning Time signaling.

#### b. Morgan Hill Train Station Pedestrian At-Grade Crossing

As discussed previously, in order to have a Quiet Zone, this at-grade crossing will need the installation of the following:

- automatic pedestrian gates and tactile warning strips, and
- Constant Warning Time signaling.

#### c. East Main Avenue

East Main Avenue is located in downtown Morgan Hill and adjacent to multi-family dwellings. The following enhancements will most likely be requested by the UP and the CPUC:

- four-quadrant automatic gates with vehicle presence detection,

- automatic pedestrian gates, swing gates, and associated channelization installed on each sidewalk, and
- Constant Warning Time signaling.

d. Tilton Avenue

Tilton Avenue has the most modern enhancements of the four at-grade crossings. The following enhancements may be requested by the CPUC and the UP:

- four-quadrant automatic gates with vehicle presence detection,
- automatic pedestrian gates, swing gates, and associated channelization installed on each sidewalk, and
- Constant Warning Time signaling.

## Costs of Enhancements

The costs associated with this scenario was developed using historical data as well as current cost records. These costs are shown summarized in Table 3, with a full estimate in Appendix E - Conceptual Cost Estimate.

In addition to these costs, there are additional maintenance costs associated with the at-grade crossings. These costs are as follows:

- Railroad Maintenance – It is the policy of the UP to have the municipality pay for the annual maintenance of the exit gates. This is approximately \$5,000 per year for two gates.
- City Maintenance – The four quadrant gate system utilizes in pavement detector loops to control the exit gates. The city would maintain these detectors. This is estimated at \$1,000 - \$3,000 per year for each at-grade crossing.



Table 3: Scenario Cost Estimate

East Dunne Avenue			
	Civil Work	\$ 359,434	
	Signal Work	\$ 151,600	
	Total		\$ 511,034
Morgan Hill Train Station Pedestrian Crossing			
	Civil Work	\$ 29,044	
	Signal Work	\$ 95,900	
	Total		\$ 124,944
East Main Street			
	Civil Work	\$ 260,955	
	Signal Work	\$ 440,780	
	Total		\$ 701,735
Tilton Avenue			
	Civil Work	\$ 239,335	
	Signal Work	\$ 440,495	
	Total		\$ 679,830
Totals			
	Subtotal		\$ 2,017,543
	Contingency	30%	\$ 605,263
	Total		\$ 2,622,805
	Mobilization and Demobilization	10%	\$ 262,280.53
	Agency Costs	8%	\$ 209,824.42
	Engineering (Civil)	10%	\$ 262,280.53
	Engineering (Railroad)	10%	\$ 112,877.50
	Permitting	5%	\$ 131,140.26
			\$ 4,206,471

## Funding

There is limited funding available for at-grade crossing enhancements. The following are potential sources of funding.

### **Section 130**

The California Section 130 Grade Crossing Hazard Elimination Program (Section 130) provides state funding to local agencies and railroads to eliminate hazards at existing at-grade crossings.

This funding is available through a competitive grant process. However, funds are limited and seldom used for the creation of Quiet Zones.

### **State Transportation Improvement Program (STIP)**

The State Transportation Improvement Program is multi-year capital program of transportation projects. This is funded with reserves from the Transportation Investment Fund and other sources. STIP programming occurs every two years. The cycle begins with the issuing of the fund estimate in July of odd-numbered years. This is followed by adoption of the estimate by the California Transportation Commission (CTC) in August of odd numbered years. Once the fund is adopted, Caltrans and the CTC prepare transportation improvement plans in December of odd years. The STIP is adopted by the CTC in even years. Local agencies should work through their Regional Transportation Planning Agency, County Transportation Commission, or Metropolitan Planning commission to nominate projects. Due to over programming of STIP funds, no new projects were funded for the 2016-2017 cycle. However, with the recent passage of SB1 there are additional funds programmed for the STIP. This could open up the plan for new projects.

### **Public Transportation Modernization, Improvement, and Service Enhancement Account (PTMISEA)**

A component of the STIP is Proposition 1B PTMISEA. These funds are obligated by the state legislature each year and can be used for transit rehabilitation, safety or modernization improvements, capital service enhancements or expansions, new capital projects, bus rapid transit improvements, or rolling stock (buses and rail cars) procurement, rehabilitation or replacement. These funds usually flow through the local transportation commissions or railroad. The city may or may not get funding directly from the state.

### **Notice of Funding Allocation (NOFA)**

Periodically, the FRA and FTA release a NOFA for funding of various types of projects. The last NOFA that could be used for the funding of at-grade crossings was issued in 2016. It is not known at this time if another opportunity will be offered in the future.

## Next Steps

The work that has been done to date is a study of the feasibility of creating a Quiet Zone. This included a site visit with city staff and the development of a preliminary concept to use as discussion points. The next steps associated with the feasibility study include:

- meet with the City Council to develop the next steps,

- field Diagnostic Meeting with the CPUC and the UP to determine what enhancements will be desired at the at-grade crossings, and
- finalize Quiet Zone Feasibility Study.

## Conclusion

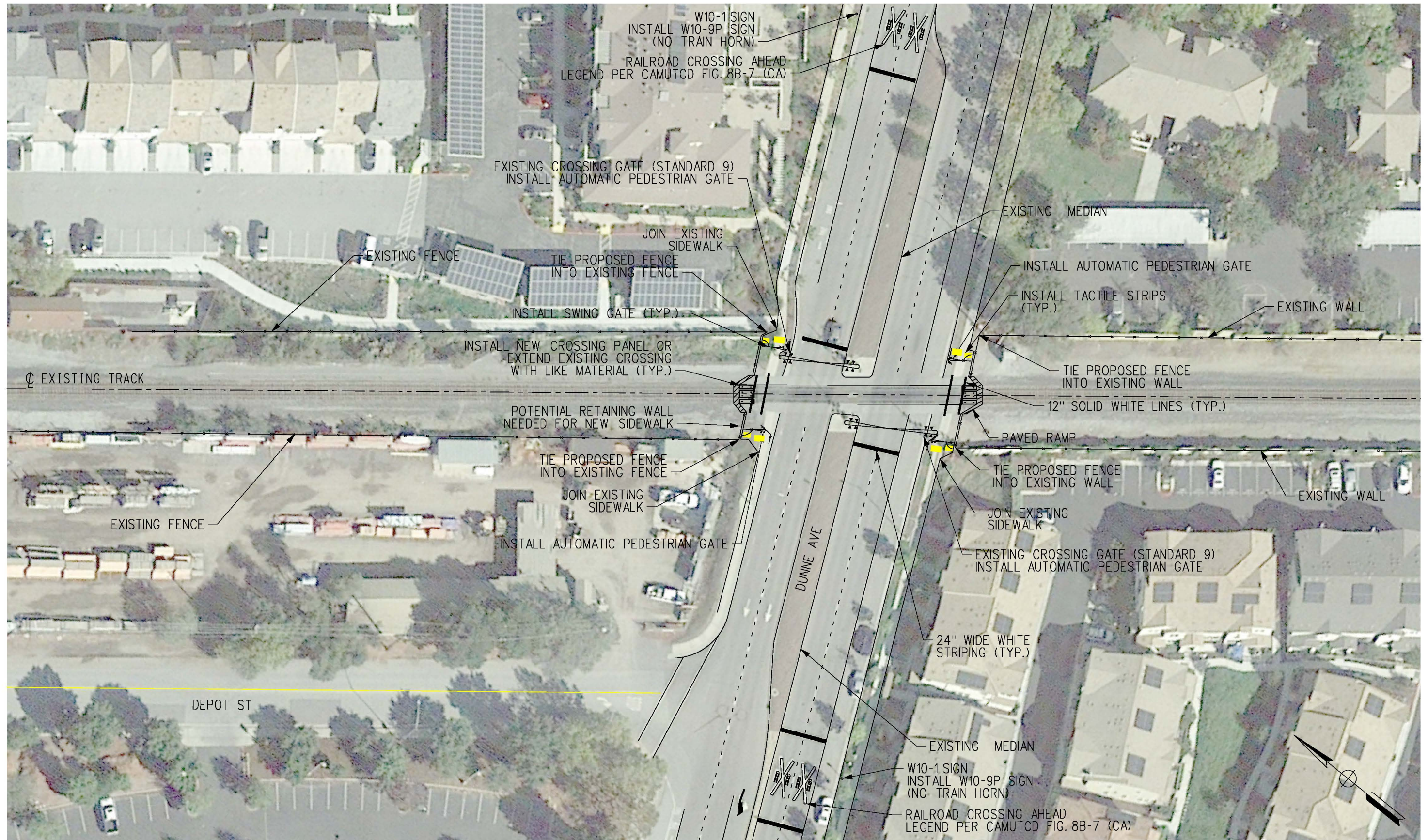
A review of the history for the four at-grade crossings showed that there were two accidents at one at-grade crossing and a single fatality at another, indicating the low hazard that currently exists at these at-grade crossings.

From this study it was determined that a Quiet Zone is feasible utilizing SSMs. ASMs would not be needed in either of the scenarios developed. A scenario was developed for the adoption of a Quiet Zone in this corridor. This alternative satisfies the requirements for the creation of a Quiet Zone. In addition, it should also be noted that the at-grade crossings would be subject to annual risk computation by the FRA, which may require SSM/ASM adjustments to reduce risk for at-grade crossings exceeding the NSRT or fully compensate for the absence of the train horn at the location. The conceptual cost of this scenario was developed as were conceptual drawings of the scenario. The costs are preliminary, with no civil engineering work having been completed to prepare these estimates.

## Appendices

## Appendix A - Conceptual Drawings





**DRAFT**

**Michael Baker**  
**INTERNATIONAL**

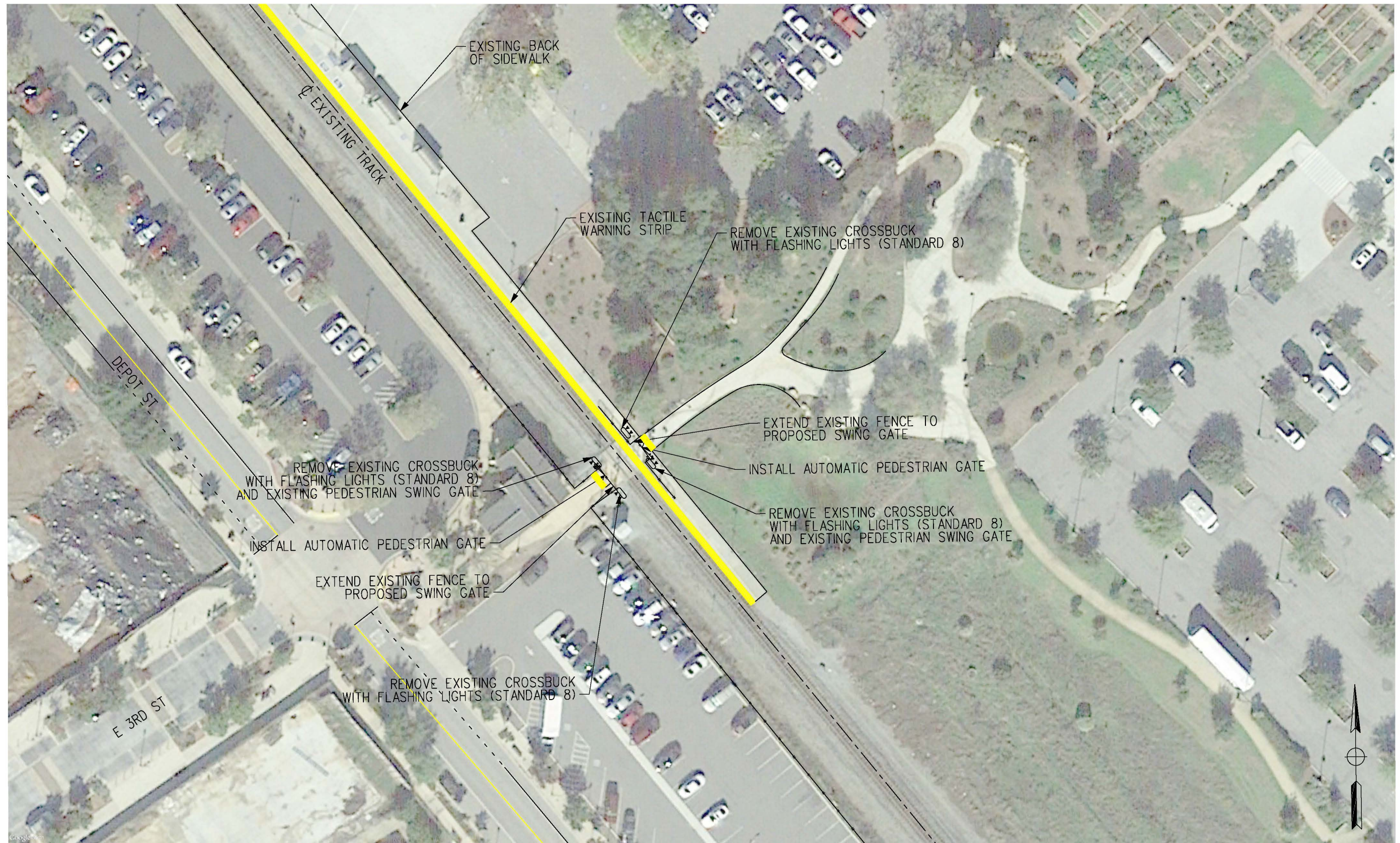
801 S GRAND, SUITE 250  
LOS ANGELES, CA 90017  
PHONE: (213) 627-8645  
MBAKERINTL.COM



CONTRACT NO.		C-XXXX	
DRAWING NO.		X-XX	
REVISION	0	SHEET NO.	1 OF 1
SCALE		1" = 50'	

CITY OF MORGAN HILL  
QUIET ZONE FEASIBILITY STUDY  
SCENARIO 2  
CONCEPTUAL PLANS  
DUNNE AVENUE





**DRAFT**

**Michael Baker**  
**INTERNATIONAL**

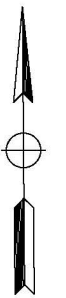
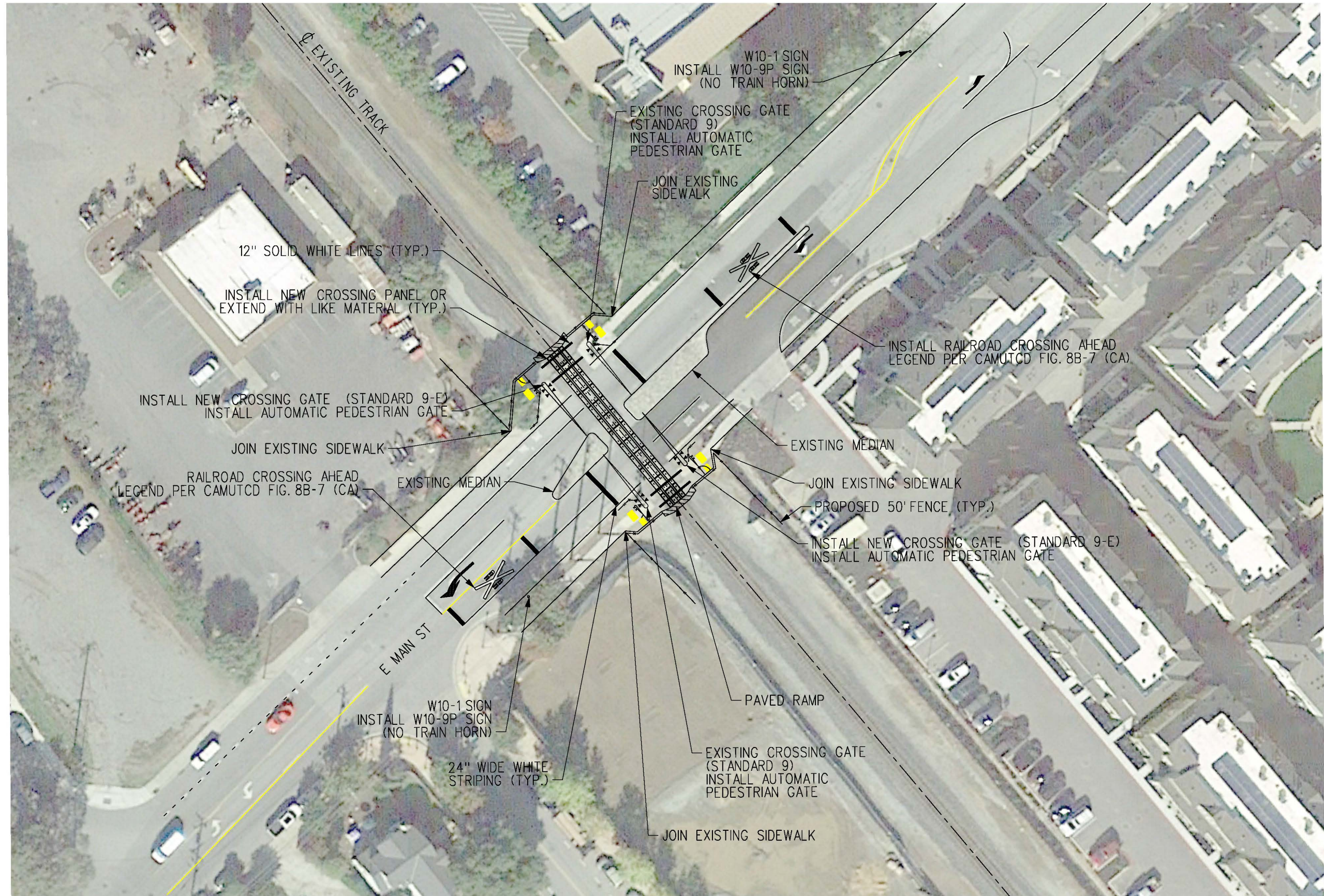
801 S GRAND, SUITE 250  
LOS ANGELES, CA 90017  
PHONE: (213) 627-8645  
MBAKERINTL.COM



CONTRACT NO.		C-XXXX	
DRAWING NO.		X-XX	
REVISION	0	SHEET NO.	1 OF 1
SCALE		1" = 50'	

CITY OF MORGAN HILL  
QUIET ZONE FEASIBILITY STUDY  
SCENARIO 2  
CONCEPTUAL PLANS  
STATION PEDESTRIAN CROSSING





**DRAFT**

**Michael Baker**  
INTERNATIONAL

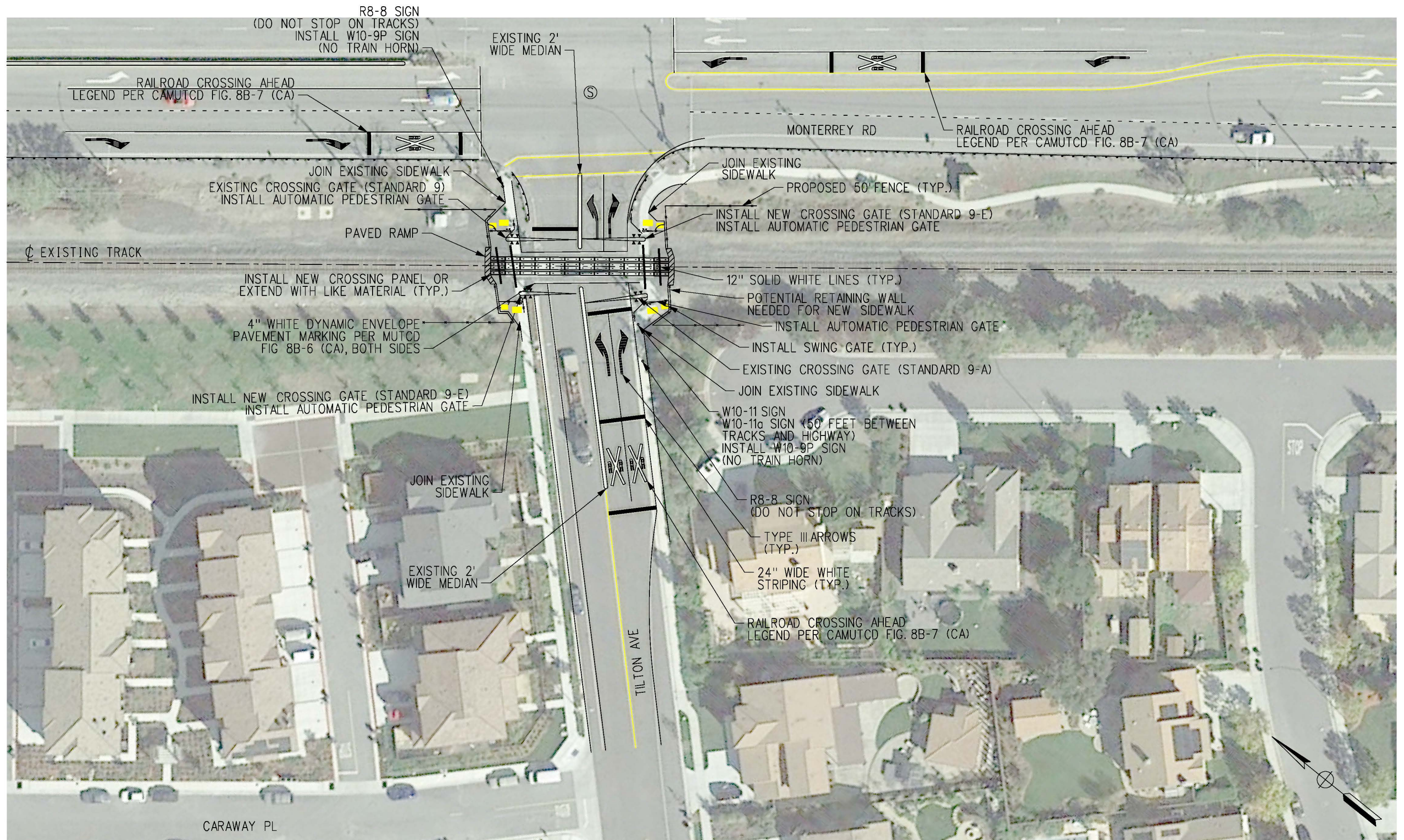
801 S GRAND, SUITE 250  
LOS ANGELES, CA 90017  
PHONE: (213) 627-8645  
MBAKERINTL.COM



CONTRACT NO.		C-XXXX	
DRAWING NO.		X-XX	
REVISION	0	SHEET NO.	1 OF 1
SCALE		1" = 50'	

CITY OF MORGAN HILL  
QUIET ZONE FEASIBILITY STUDY  
SCENARIO 2  
CONCEPTUAL PLANS  
E MAIN STREET





**DRAFT**

**Michael Baker**  
**INTERNATIONAL**

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CONTRACT NO.		C-XXXX	
DRAWING NO.		X-XX	
REVISION	0	SHEET NO.	1 OF 1
SCALE		1" = 50'	

CITY OF MORGAN HILL  
QUIET ZONE FEASIBILITY STUDY  
SCENARIO 2  
CONCEPTUAL PLANS  
TILTON AVENUE



## Appendix B - U.S. DOT Crossing Inventory Reports

# U. S. DOT CROSSING INVENTORY FORM

## DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk \* denotes an optional field.

<b>A. Revision Date</b> (MM/DD/YYYY) 11 / 12 / 2016	<b>B. Reporting Agency</b> <input checked="" type="checkbox"/> Railroad <input type="checkbox"/> Transit <input type="checkbox"/> State <input type="checkbox"/> Other	<b>C. Reason for Update (Select only one)</b> <input checked="" type="checkbox"/> Change in Data <input type="checkbox"/> New Crossing <input type="checkbox"/> Closed <input type="checkbox"/> Re-Open <input type="checkbox"/> Date Change Only <input type="checkbox"/> Change in Primary Operating RR <input type="checkbox"/> No Train Traffic <input type="checkbox"/> Quiet Zone Update <input type="checkbox"/> Admin. Correction	<b>D. DOT Crossing Inventory Number</b> 755162N
---	--	--	--

### Part I: Location and Classification Information

<b>1. Primary Operating Railroad</b> Union Pacific Railroad Company [UP]		<b>2. State</b> CALIFORNIA		<b>3. County</b> SANTA CLARA	
<b>4. City / Municipality</b> <input checked="" type="checkbox"/> In <input type="checkbox"/> Near    MORGAN HILL		<b>5. Street/Road Name &amp; Block Number</b> EAST DUNNE AVENUE (Street/Road Name)    * (Block Number)		<b>6. Highway Type &amp; No.</b> CITY	
<b>7. Do Other Railroads Operate a Separate Track at Crossing?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Specify RR			<b>8. Do Other Railroads Operate Over Your Track at Crossing?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Specify RR    ATK		
<b>9. Railroad Division or Region</b> <input type="checkbox"/> None    ROSEVILLE		<b>10. Railroad Subdivision or District</b> <input type="checkbox"/> None    Coast		<b>11. Branch or Line Name</b> <input checked="" type="checkbox"/> None	
<b>12. RR Milepost</b> 0067.780 (prefix)   (nnnn.nnn)   (suffix)					
<b>13. Line Segment</b> *		<b>14. Nearest RR Timetable Station</b> *		<b>15. Parent RR (if applicable)</b> <input checked="" type="checkbox"/> N/A	
<b>16. Crossing Owner (if applicable)</b> <input checked="" type="checkbox"/> N/A					
<b>17. Crossing Type</b> <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private		<b>18. Crossing Purpose</b> <input checked="" type="checkbox"/> Highway <input type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.		<b>19. Crossing Position</b> <input checked="" type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over	
<b>20. Public Access (if Private Crossing)</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>21. Type of Train</b> <input checked="" type="checkbox"/> Freight <input type="checkbox"/> Intercity Passenger <input type="checkbox"/> Commuter <input type="checkbox"/> Transit <input type="checkbox"/> Shared Use Transit <input type="checkbox"/> Tourist/Other		<b>22. Average Passenger Train Count Per Day</b> <input checked="" type="checkbox"/> Less Than One Per Day <input type="checkbox"/> Number Per Day	
<b>23. Type of Land Use</b> <input type="checkbox"/> Open Space <input type="checkbox"/> Farm <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard					
<b>24. Is there an Adjacent Crossing with a Separate Number?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    If Yes, Provide Crossing Number			<b>25. Quiet Zone (FRA provided)</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input type="checkbox"/> Chicago Excused    Date Established		
<b>26. HSR Corridor ID</b> <input checked="" type="checkbox"/> N/A		<b>27. Latitude in decimal degrees</b> (WGS84 std: nn.nnnnnnn) 37.1263623		<b>28. Longitude in decimal degrees</b> (WGS84 std: -nnn.nnnnnnn) -121.6472013	
<b>29. Lat/Long Source</b> <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Estimated					
<b>30.A. Railroad Use *</b>			<b>31.A. State Use *</b>		
<b>30.B. Railroad Use *</b>			<b>31.B. State Use *</b>		
<b>30.C. Railroad Use *</b>			<b>31.C. State Use *</b>		
<b>30.D. Railroad Use *</b>			<b>31.D. State Use *</b>		
<b>32.A. Narrative (Railroad Use) *</b>			<b>32.B. Narrative (State Use) *</b>		
<b>33. Emergency Notification Telephone No. (posted)</b> 800-848-8715		<b>34. Railroad Contact (Telephone No.)</b> 402-544-3721		<b>35. State Contact (Telephone No.)</b> 415-703-3722	

### Part II: Railroad Information

<b>1. Estimated Number of Daily Train Movements</b>				
<b>1.A. Total Day Thru Trains (6 AM to 6 PM)</b> 5	<b>1.B. Total Night Thru Trains (6 PM to 6 AM)</b> 5	<b>1.C. Total Switching Trains</b> 2	<b>1.D. Total Transit Trains</b> 0	<b>1.E. Check if Less Than One Movement Per Day</b> <input type="checkbox"/> How many trains per week?
<b>2. Year of Train Count Data (YYYY)</b> 2016		<b>3. Speed of Train at Crossing</b> 3.A. Maximum Timetable Speed (mph) 79 3.B. Typical Speed Range Over Crossing (mph) From 30 to 60		
<b>4. Type and Count of Tracks</b> Main 1    Siding 0    Yard 0    Transit 0    Industry 0				
<b>5. Train Detection (Main Track only)</b> <input type="checkbox"/> Constant Warning Time <input type="checkbox"/> Motion Detection <input type="checkbox"/> AFO <input type="checkbox"/> PTC <input type="checkbox"/> DC <input checked="" type="checkbox"/> Other <input type="checkbox"/> None				
<b>6. Is Track Signaled?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.A. Event Recorder</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.B. Remote Health Monitoring</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

# U. S. DOT CROSSING INVENTORY FORM

A. Revision Date (MM/DD/YYYY) 11/12/2016		PAGE 2		D. Crossing Inventory Number (7 char.) 755162N	
<b>Part III: Highway or Pathway Traffic Control Device Information</b>					
1. Are there Signs or Signals?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2. Types of Passive Traffic Control Devices associated with the Crossing			
2.A. Crossbuck Assemblies (count) 0		2.B. STOP Signs (R1-1) (count) 0	2.C. YIELD Signs (R1-2) (count)	2.D. Advance Warning Signs (Check all that apply; include count) <input type="checkbox"/> None <input checked="" type="checkbox"/> W10-1 <input type="checkbox"/> W10-3 <input type="checkbox"/> W10-11 <input type="checkbox"/> W10-2 <input type="checkbox"/> W10-4 <input type="checkbox"/> W10-12	
2.E. Low Ground Clearance Sign (W10-5) <input type="checkbox"/> Yes (count 0) <input checked="" type="checkbox"/> No		2.F. Pavement Markings <input checked="" type="checkbox"/> Stop Lines <input type="checkbox"/> Dynamic Envelope <input checked="" type="checkbox"/> RR Xing Symbols <input type="checkbox"/> None		2.G. Channelization Devices/Medians <input type="checkbox"/> All Approaches <input type="checkbox"/> Median <input type="checkbox"/> One Approach <input type="checkbox"/> None	
2.H. EXEMPT Sign (R15-3) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		2.I. ENS Sign (I-13) Displayed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
2.J. Other MUTCD Signs Specify Type _____ Count 0 Specify Type _____ Count 0 Specify Type _____ Count _____		2.K. Private Crossing Signs (if private) <input type="checkbox"/> Yes <input type="checkbox"/> No		2.L. LED Enhanced Signs (List types)	
<b>3. Types of Train Activated Warning Devices at the Grade Crossing (specify count of each device for all that apply)</b>					
3.A. Gate Arms (count) Roadway 2 Pedestrian _____		3.B. Gate Configuration <input type="checkbox"/> 2 Quad <input type="checkbox"/> Full (Barrier) Resistance <input type="checkbox"/> 3 Quad <input type="checkbox"/> Median Gates <input type="checkbox"/> 4 Quad		3.C. Cantilevered (or Bridged) Flashing Light Structures (count) Over Traffic Lane 0 <input type="checkbox"/> Incandescent Not Over Traffic Lane 0 <input type="checkbox"/> LED	
3.D. Mast Mounted Flashing Lights (count of masts) 2 <input type="checkbox"/> Incandescent <input type="checkbox"/> LED <input type="checkbox"/> Back Lights Included <input type="checkbox"/> Side Lights Included		3.E. Total Count of Flashing Light Pairs 0			
3.F. Installation Date of Current Active Warning Devices: (MM/YYYY) _____/_____/_____ <input checked="" type="checkbox"/> Not Required		3.G. Wayside Horn <input type="checkbox"/> Yes   Installed on (MM/YYYY) ____/____/_____ <input type="checkbox"/> No		3.H. Highway Traffic Signals Controlling Crossing <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
3.I. Bells (count) 2		3.J. Non-Train Active Warning <input type="checkbox"/> Flagging/Flagman <input type="checkbox"/> Manually Operated Signals <input type="checkbox"/> Watchman <input type="checkbox"/> Floodlighting <input type="checkbox"/> None			
3.K. Other Flashing Lights or Warning Devices Count 0   Specify type _____					
4.A. Does nearby Hwy Intersection have Traffic Signals? <input type="checkbox"/> Yes <input type="checkbox"/> No		4.B. Hwy Traffic Signal Interconnection <input type="checkbox"/> Not Interconnected <input type="checkbox"/> For Traffic Signals <input type="checkbox"/> For Warning Signs		4.C. Hwy Traffic Signal Preemption <input type="checkbox"/> Simultaneous <input type="checkbox"/> Advance	
5. Highway Traffic Pre-Signals <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Storage Distance * _____ Stop Line Distance * _____		6. Highway Monitoring Devices (Check all that apply) <input type="checkbox"/> Yes - Photo/Video Recording <input type="checkbox"/> Yes - Vehicle Presence Detection <input type="checkbox"/> None			
<b>Part IV: Physical Characteristics</b>					
1. Traffic Lanes Crossing Railroad Number of Lanes 2 <input type="checkbox"/> One-way Traffic <input type="checkbox"/> Two-way Traffic <input type="checkbox"/> Divided Traffic		2. Is Roadway/Pathway Paved? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3. Does Track Run Down a Street? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4. Is Crossing Illuminated? (Street lights within approx. 50 feet from nearest rail) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
5. Crossing Surface (on Main Track, multiple types allowed)   Installation Date * (MM/YYYY) ____/____/_____ <input type="checkbox"/> 1 Timber <input checked="" type="checkbox"/> 2 Asphalt <input type="checkbox"/> 3 Asphalt and Timber <input type="checkbox"/> 4 Concrete <input type="checkbox"/> 5 Concrete and Rubber <input type="checkbox"/> 6 Rubber <input type="checkbox"/> 7 Metal <input type="checkbox"/> 8 Unconsolidated <input type="checkbox"/> 9 Composite <input type="checkbox"/> 10 Other (specify) _____					
6. Intersecting Roadway within 500 feet? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   If Yes, Approximate Distance (feet) 75		7. Smallest Crossing Angle <input type="checkbox"/> 0° - 29° <input type="checkbox"/> 30° - 59° <input checked="" type="checkbox"/> 60° - 90°		8. Is Commercial Power Available? * <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Part V: Public Highway Information</b>					
1. Highway System  <input type="checkbox"/> (01) Interstate Highway System <input type="checkbox"/> (02) Other Nat Hwy System (NHS) <input checked="" type="checkbox"/> (03) Federal AID, Not NHS <input type="checkbox"/> (08) Non-Federal AID		2. Functional Classification of Road at Crossing <input type="checkbox"/> (0) Rural <input checked="" type="checkbox"/> (1) Urban <input type="checkbox"/> (1) Interstate <input type="checkbox"/> (5) Major Collector <input type="checkbox"/> (2) Other Freeways and Expressways <input type="checkbox"/> (3) Other Principal Arterial <input type="checkbox"/> (6) Minor Collector <input checked="" type="checkbox"/> (4) Minor Arterial <input type="checkbox"/> (7) Local		3. Is Crossing on State Highway System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4. Highway Speed Limit _____ MPH <input type="checkbox"/> Posted <input type="checkbox"/> Statutory		5. Linear Referencing System (LRS Route ID) *			
6. LRS Milepost *					
7. Annual Average Daily Traffic (AADT) Year 1989   AADT 15000		8. Estimated Percent Trucks 10 %		9. Regularly Used by School Buses? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   Average Number per Day 0	
10. Emergency Services Route <input type="checkbox"/> Yes <input type="checkbox"/> No					
<b>Submission Information - This information is used for administrative purposes and is not available on the public website.</b>					
Submitted by _____ Organization _____ Phone _____ Date _____  Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.					

# U. S. DOT CROSSING INVENTORY FORM

## DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk \* denotes an optional field.

<b>A. Revision Date</b> (MM/DD/YYYY) 09 / 14 / 2016	<b>B. Reporting Agency</b> <input checked="" type="checkbox"/> Railroad <input type="checkbox"/> Transit <input type="checkbox"/> State <input type="checkbox"/> Other	<b>C. Reason for Update (Select only one)</b> <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Change in Data  <input type="checkbox"/> Re-Open         </div> <div> <input checked="" type="checkbox"/> New Crossing  <input type="checkbox"/> Date Change Only         </div> <div> <input type="checkbox"/> Closed  <input type="checkbox"/> Change in Primary Operating RR         </div> <div> <input type="checkbox"/> No Train Traffic  <input type="checkbox"/> Admin. Correction         </div> <div> <input type="checkbox"/> Quiet Zone Update         </div> </div>	<b>D. DOT Crossing Inventory Number</b> 920463M
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### Part I: Location and Classification Information

<b>1. Primary Operating Railroad</b> Union Pacific Railroad Company [UP]		<b>2. State</b> CALIFORNIA		<b>3. County</b> SANTA CLARA	
<b>4. City / Municipality</b> <input checked="" type="checkbox"/> In <input type="checkbox"/> Near    MORGAN HILL		<b>5. Street/Road Name &amp; Block Number</b> MORGAN HILL PED X (Street/Road Name)    * (Block Number)		<b>6. Highway Type &amp; No.</b> NA	
<b>7. Do Other Railroads Operate a Separate Track at Crossing?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Specify RR			<b>8. Do Other Railroads Operate Over Your Track at Crossing?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Specify RR    ATK		
<b>9. Railroad Division or Region</b> <input type="checkbox"/> None    ROSEVILLE		<b>10. Railroad Subdivision or District</b> <input type="checkbox"/> None    Coast		<b>11. Branch or Line Name</b> <input checked="" type="checkbox"/> None	
<b>12. RR Milepost</b> 0067.530 (prefix)   (nnnn.nnn)   (suffix)					
<b>13. Line Segment</b> *		<b>14. Nearest RR Timetable Station</b> *		<b>15. Parent RR (if applicable)</b> <input checked="" type="checkbox"/> N/A	
<b>16. Crossing Owner (if applicable)</b> <input checked="" type="checkbox"/> N/A					
<b>17. Crossing Type</b> <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private	<b>18. Crossing Purpose</b> <input type="checkbox"/> Highway <input checked="" type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.	<b>19. Crossing Position</b> <input checked="" type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over	<b>20. Public Access (if Private Crossing)</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>21. Type of Train</b> <input checked="" type="checkbox"/> Freight <input checked="" type="checkbox"/> Intercity Passenger <input type="checkbox"/> Commuter	<b>22. Average Passenger Train Count Per Day</b> <input type="checkbox"/> Less Than One Per Day <input checked="" type="checkbox"/> Number Per Day 2
<b>23. Type of Land Use</b> <input checked="" type="checkbox"/> Open Space <input type="checkbox"/> Farm <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard					
<b>24. Is there an Adjacent Crossing with a Separate Number?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    If Yes, Provide Crossing Number			<b>25. Quiet Zone (FRA provided)</b> <input type="checkbox"/> No <input type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input type="checkbox"/> Chicago Excused    Date Established		
<b>26. HSR Corridor ID</b> <input checked="" type="checkbox"/> N/A		<b>27. Latitude in decimal degrees</b> (WGS84 std: nn.nnnnnnn) 37.1292150		<b>28. Longitude in decimal degrees</b> (WGS84 std: -nnn.nnnnnnn) -121.6501230	
<b>29. Lat/Long Source</b> <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Estimated					
<b>30.A. Railroad Use *</b>			<b>31.A. State Use *</b>		
<b>30.B. Railroad Use *</b>			<b>31.B. State Use *</b>		
<b>30.C. Railroad Use *</b>			<b>31.C. State Use *</b>		
<b>30.D. Railroad Use *</b>			<b>31.D. State Use *</b>		
<b>32.A. Narrative (Railroad Use) *</b>			<b>32.B. Narrative (State Use) *</b>		
<b>33. Emergency Notification Telephone No. (posted)</b> 800-848-8715		<b>34. Railroad Contact (Telephone No.)</b> 402-544-3721		<b>35. State Contact (Telephone No.)</b> 555-555-5555	

### Part II: Railroad Information

<b>1. Estimated Number of Daily Train Movements</b>				
<b>1.A. Total Day Thru Trains (6 AM to 6 PM)</b> 5	<b>1.B. Total Night Thru Trains (6 PM to 6 AM)</b> 5	<b>1.C. Total Switching Trains</b> 2	<b>1.D. Total Transit Trains</b> 0	<b>1.E. Check if Less Than One Movement Per Day</b> <input type="checkbox"/> How many trains per week?
<b>2. Year of Train Count Data (YYYY)</b> 2016		<b>3. Speed of Train at Crossing</b> 3.A. Maximum Timetable Speed (mph) 79 3.B. Typical Speed Range Over Crossing (mph) From 30 to 60		
<b>4. Type and Count of Tracks</b> Main 1    Siding 0    Yard 0    Transit 0    Industry 0				
<b>5. Train Detection (Main Track only)</b> <input type="checkbox"/> Constant Warning Time <input type="checkbox"/> Motion Detection <input type="checkbox"/> AFO <input type="checkbox"/> PTC <input type="checkbox"/> DC <input checked="" type="checkbox"/> Other <input type="checkbox"/> None				
<b>6. Is Track Signaled?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>7.A. Event Recorder</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.B. Remote Health Monitoring</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

# U. S. DOT CROSSING INVENTORY FORM

A. Revision Date (MM/DD/YYYY) 09/14/2016		PAGE 2		D. Crossing Inventory Number (7 char.) 920463M	
<b>Part III: Highway or Pathway Traffic Control Device Information</b>					
1. Are there Signs or Signals?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2. Types of Passive Traffic Control Devices associated with the Crossing			
2.A. Crossbuck Assemblies (count)  <input type="checkbox"/> Yes <input type="checkbox"/> No		2.B. STOP Signs (R1-1) (count)  <input type="checkbox"/> Yes <input type="checkbox"/> No	2.C. YIELD Signs (R1-2) (count)  <input type="checkbox"/> Yes <input type="checkbox"/> No	2.D. Advance Warning Signs (Check all that apply; include count) <input type="checkbox"/> None <input type="checkbox"/> W10-1 <input type="checkbox"/> W10-3 <input type="checkbox"/> W10-11 <input type="checkbox"/> W10-2 <input type="checkbox"/> W10-4 <input type="checkbox"/> W10-12	
2.E. Low Ground Clearance Sign (W10-5) <input type="checkbox"/> Yes (count _____) <input type="checkbox"/> No	2.F. Pavement Markings <input type="checkbox"/> Stop Lines <input type="checkbox"/> Dynamic Envelope <input type="checkbox"/> RR Xing Symbols <input checked="" type="checkbox"/> None		2.G. Channelization Devices/Medians <input type="checkbox"/> All Approaches <input type="checkbox"/> Median <input type="checkbox"/> One Approach <input type="checkbox"/> None		2.H. EXEMPT Sign (R15-3) <input type="checkbox"/> Yes <input type="checkbox"/> No
2.J. Other MUTCD Signs Specify Type _____ Count _____ Specify Type _____ Count _____ Specify Type _____ Count _____		2.K. Private Crossing Signs (if private) <input type="checkbox"/> Yes <input type="checkbox"/> No		2.L. LED Enhanced Signs (List types)	
<b>3. Types of Train Activated Warning Devices at the Grade Crossing (specify count of each device for all that apply)</b>					
3.A. Gate Arms (count)  Roadway _____ Pedestrian _____	3.B. Gate Configuration <input type="checkbox"/> 2 Quad <input type="checkbox"/> Full (Barrier) <input type="checkbox"/> 3 Quad   Resistance <input type="checkbox"/> 4 Quad   Median Gates	3.C. Cantilevered (or Bridged) Flashing Light Structures (count) Over Traffic Lane _____ <input type="checkbox"/> Incandescent Not Over Traffic Lane _____ <input type="checkbox"/> LED		3.D. Mast Mounted Flashing Lights (count of masts) 2 <input type="checkbox"/> Incandescent <input checked="" type="checkbox"/> LED <input checked="" type="checkbox"/> Back Lights Included <input type="checkbox"/> Side Lights Included	3.E. Total Count of Flashing Light Pairs  2
3.F. Installation Date of Current Active Warning Devices: (MM/YYYY) _____/_____/_____ <input checked="" type="checkbox"/> Not Required		3.G. Wayside Horn <input type="checkbox"/> Yes   Installed on (MM/YYYY) ____/____/_____ <input type="checkbox"/> No		3.H. Highway Traffic Signals Controlling Crossing <input type="checkbox"/> Yes <input type="checkbox"/> No	
3.J. Non-Train Active Warning <input type="checkbox"/> Flagging/Flagman <input type="checkbox"/> Manually Operated Signals <input type="checkbox"/> Watchman <input type="checkbox"/> Floodlighting <input type="checkbox"/> None				3.K. Other Flashing Lights or Warning Devices Count _____ Specify type _____	
4.A. Does nearby Hwy Intersection have Traffic Signals?  <input type="checkbox"/> Yes <input type="checkbox"/> No	4.B. Hwy Traffic Signal Interconnection <input type="checkbox"/> Not Interconnected <input type="checkbox"/> For Traffic Signals <input type="checkbox"/> For Warning Signs	4.C. Hwy Traffic Signal Preemption <input type="checkbox"/> Simultaneous <input type="checkbox"/> Advance	5. Highway Traffic Pre-Signals <input type="checkbox"/> Yes <input type="checkbox"/> No Storage Distance * _____ Stop Line Distance * _____		6. Highway Monitoring Devices (Check all that apply) <input type="checkbox"/> Yes - Photo/Video Recording <input type="checkbox"/> Yes - Vehicle Presence Detection <input type="checkbox"/> None
<b>Part IV: Physical Characteristics</b>					
1. Traffic Lanes Crossing Railroad Number of Lanes 0 <input type="checkbox"/> One-way Traffic <input type="checkbox"/> Two-way Traffic <input type="checkbox"/> Divided Traffic		2. Is Roadway/Pathway Paved? <input type="checkbox"/> Yes <input type="checkbox"/> No		3. Does Track Run Down a Street? <input type="checkbox"/> Yes <input type="checkbox"/> No	
4. Is Crossing Illuminated? (Street lights within approx. 50 feet from nearest rail) <input type="checkbox"/> Yes <input type="checkbox"/> No					
5. Crossing Surface (on Main Track, multiple types allowed)   Installation Date * (MM/YYYY) ____/____/_____ <input type="checkbox"/> 1 Timber <input type="checkbox"/> 2 Asphalt <input type="checkbox"/> 3 Asphalt and Timber <input type="checkbox"/> 4 Concrete <input type="checkbox"/> 5 Concrete and Rubber <input type="checkbox"/> 6 Rubber <input type="checkbox"/> 7 Metal <input type="checkbox"/> 8 Unconsolidated <input type="checkbox"/> 9 Composite <input type="checkbox"/> 10 Other (specify) _____					
6. Intersecting Roadway within 500 feet? <input type="checkbox"/> Yes <input type="checkbox"/> No   If Yes, Approximate Distance (feet) _____			7. Smallest Crossing Angle <input type="checkbox"/> 0° - 29° <input type="checkbox"/> 30° - 59° <input type="checkbox"/> 60° - 90°		8. Is Commercial Power Available? * <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Part V: Public Highway Information</b>					
1. Highway System <input type="checkbox"/> (01) Interstate Highway System <input type="checkbox"/> (02) Other Nat Hwy System (NHS) <input type="checkbox"/> (03) Federal AID, Not NHS <input type="checkbox"/> (08) Non-Federal Aid		2. Functional Classification of Road at Crossing <input type="checkbox"/> (0) Rural <input type="checkbox"/> (1) Urban <input type="checkbox"/> (1) Interstate <input type="checkbox"/> (5) Major Collector <input type="checkbox"/> (2) Other Freeways and Expressways <input type="checkbox"/> (3) Other Principal Arterial <input type="checkbox"/> (6) Minor Collector <input type="checkbox"/> (4) Minor Arterial <input type="checkbox"/> (7) Local		3. Is Crossing on State Highway System? <input type="checkbox"/> Yes <input type="checkbox"/> No 5. Linear Referencing System (LRS Route ID) * 6. LRS Milepost *	
7. Annual Average Daily Traffic (AADT) Year _____ AADT _____		8. Estimated Percent Trucks _____%		9. Regularly Used by School Buses? <input type="checkbox"/> Yes <input type="checkbox"/> No   Average Number per Day _____	
10. Emergency Services Route <input type="checkbox"/> Yes <input type="checkbox"/> No					
<b>Submission Information - This information is used for administrative purposes and is not available on the public website.</b>					
Submitted by _____ Organization _____ Phone _____ Date _____					
Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.					

# U. S. DOT CROSSING INVENTORY FORM

## DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk \* denotes an optional field.

<b>A. Revision Date</b> (MM/DD/YYYY) 11 / 12 / 2016	<b>B. Reporting Agency</b> <input checked="" type="checkbox"/> Railroad <input type="checkbox"/> Transit <input type="checkbox"/> State <input type="checkbox"/> Other	<b>C. Reason for Update (Select only one)</b> <input checked="" type="checkbox"/> Change in Data <input type="checkbox"/> New Crossing <input type="checkbox"/> Closed <input type="checkbox"/> Re-Open <input type="checkbox"/> Date Change Only <input type="checkbox"/> Change in Primary Operating RR <input type="checkbox"/> No Train Traffic <input type="checkbox"/> Quiet Zone Update <input type="checkbox"/> Admin. Correction	<b>D. DOT Crossing Inventory Number</b> 755159F
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### Part I: Location and Classification Information

<b>1. Primary Operating Railroad</b> Union Pacific Railroad Company [UP]		<b>2. State</b> CALIFORNIA		<b>3. County</b> SANTA CLARA	
<b>4. City / Municipality</b> <input checked="" type="checkbox"/> In <input type="checkbox"/> Near    MORGAN HILL		<b>5. Street/Road Name &amp; Block Number</b> EAST MAIN AVENUE (Street/Road Name)    * (Block Number)		<b>6. Highway Type &amp; No.</b> CITY	
<b>7. Do Other Railroads Operate a Separate Track at Crossing?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Specify RR			<b>8. Do Other Railroads Operate Over Your Track at Crossing?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Specify RR    ATK		
<b>9. Railroad Division or Region</b> <input type="checkbox"/> None    ROSEVILLE		<b>10. Railroad Subdivision or District</b> <input type="checkbox"/> None    Coast		<b>11. Branch or Line Name</b> <input checked="" type="checkbox"/> None	
<b>12. RR Milepost</b> 0067.300 (prefix)   (nnnn.nnn)   (suffix)					
<b>13. Line Segment</b> *		<b>14. Nearest RR Timetable Station</b> *		<b>15. Parent RR (if applicable)</b> <input checked="" type="checkbox"/> N/A	
<b>16. Crossing Owner (if applicable)</b> <input checked="" type="checkbox"/> N/A					
<b>17. Crossing Type</b> <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private	<b>18. Crossing Purpose</b> <input checked="" type="checkbox"/> Highway <input type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.	<b>19. Crossing Position</b> <input checked="" type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over	<b>20. Public Access (if Private Crossing)</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>21. Type of Train</b> <input checked="" type="checkbox"/> Freight <input checked="" type="checkbox"/> Intercity Passenger <input type="checkbox"/> Commuter	<input type="checkbox"/> Transit <input type="checkbox"/> Shared Use Transit <input type="checkbox"/> Tourist/Other
<b>22. Average Passenger Train Count Per Day</b> <input checked="" type="checkbox"/> Less Than One Per Day <input type="checkbox"/> Number Per Day					
<b>23. Type of Land Use</b> <input type="checkbox"/> Open Space <input type="checkbox"/> Farm <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard					
<b>24. Is there an Adjacent Crossing with a Separate Number?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    If Yes, Provide Crossing Number			<b>25. Quiet Zone (FRA provided)</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input type="checkbox"/> Chicago Excused    Date Established		
<b>26. HSR Corridor ID</b> <input checked="" type="checkbox"/> N/A		<b>27. Latitude in decimal degrees</b> (WGS84 std: nn.nnnnnnn) 37.1317541		<b>28. Longitude in decimal degrees</b> (WGS84 std: -nnn.nnnnnnn) -121.6527209	
<b>29. Lat/Long Source</b> <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Estimated					
<b>30.A. Railroad Use *</b>			<b>31.A. State Use *</b>		
<b>30.B. Railroad Use *</b>			<b>31.B. State Use *</b>		
<b>30.C. Railroad Use *</b>			<b>31.C. State Use *</b>		
<b>30.D. Railroad Use *</b>			<b>31.D. State Use *</b>		
<b>32.A. Narrative (Railroad Use) *</b>			<b>32.B. Narrative (State Use) *</b>		
<b>33. Emergency Notification Telephone No. (posted)</b> 800-848-8715		<b>34. Railroad Contact (Telephone No.)</b> 402-544-3721		<b>35. State Contact (Telephone No.)</b> 415-703-3722	

### Part II: Railroad Information

<b>1. Estimated Number of Daily Train Movements</b>				
<b>1.A. Total Day Thru Trains (6 AM to 6 PM)</b> 5	<b>1.B. Total Night Thru Trains (6 PM to 6 AM)</b> 5	<b>1.C. Total Switching Trains</b> 2	<b>1.D. Total Transit Trains</b> 0	<b>1.E. Check if Less Than One Movement Per Day</b> <input type="checkbox"/> How many trains per week?
<b>2. Year of Train Count Data (YYYY)</b> 2016		<b>3. Speed of Train at Crossing</b> 3.A. Maximum Timetable Speed (mph) 79 3.B. Typical Speed Range Over Crossing (mph) From 30 to 60		
<b>4. Type and Count of Tracks</b> Main 1    Siding 0    Yard 0    Transit 0    Industry 0				
<b>5. Train Detection (Main Track only)</b> <input type="checkbox"/> Constant Warning Time <input type="checkbox"/> Motion Detection <input type="checkbox"/> AFO <input type="checkbox"/> PTC <input type="checkbox"/> DC <input checked="" type="checkbox"/> Other <input type="checkbox"/> None				
<b>6. Is Track Signaled?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.A. Event Recorder</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.B. Remote Health Monitoring</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

# U. S. DOT CROSSING INVENTORY FORM

A. Revision Date (MM/DD/YYYY) 11/12/2016		PAGE 2		D. Crossing Inventory Number (7 char.) 755159F	
<b>Part III: Highway or Pathway Traffic Control Device Information</b>					
1. Are there Signs or Signals?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2. Types of Passive Traffic Control Devices associated with the Crossing			
2.A. Crossbuck Assemblies (count) 0		2.B. STOP Signs (R1-1) (count) 0	2.C. YIELD Signs (R1-2) (count)	2.D. Advance Warning Signs (Check all that apply; include count) <input type="checkbox"/> None <input checked="" type="checkbox"/> W10-1 <input type="checkbox"/> W10-3 <input type="checkbox"/> W10-11 <input type="checkbox"/> W10-2 <input type="checkbox"/> W10-4 <input type="checkbox"/> W10-12	
2.E. Low Ground Clearance Sign (W10-5) <input type="checkbox"/> Yes (count 0) <input checked="" type="checkbox"/> No		2.F. Pavement Markings <input checked="" type="checkbox"/> Stop Lines <input type="checkbox"/> Dynamic Envelope <input checked="" type="checkbox"/> RR Xing Symbols <input type="checkbox"/> None		2.G. Channelization Devices/Medians <input type="checkbox"/> All Approaches <input type="checkbox"/> Median <input type="checkbox"/> One Approach <input type="checkbox"/> None	
2.H. EXEMPT Sign (R15-3) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		2.I. ENS Sign (I-13) Displayed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
2.J. Other MUTCD Signs Specify Type _____ Count 0 Specify Type _____ Count 0 Specify Type _____ Count _____		2.K. Private Crossing Signs (if private) <input type="checkbox"/> Yes <input type="checkbox"/> No		2.L. LED Enhanced Signs (List types)	
<b>3. Types of Train Activated Warning Devices at the Grade Crossing (specify count of each device for all that apply)</b>					
3.A. Gate Arms (count)  Roadway 0 Pedestrian _____		3.B. Gate Configuration <input type="checkbox"/> 2 Quad <input type="checkbox"/> Full (Barrier) Resistance <input type="checkbox"/> 3 Quad <input type="checkbox"/> Median Gates <input type="checkbox"/> 4 Quad		3.C. Cantilevered (or Bridged) Flashing Light Structures (count) Over Traffic Lane 0 <input type="checkbox"/> Incandescent Not Over Traffic Lane 0 <input type="checkbox"/> LED	
3.D. Mast Mounted Flashing Lights (count of masts) 2 <input type="checkbox"/> Incandescent <input type="checkbox"/> LED <input type="checkbox"/> Back Lights Included <input type="checkbox"/> Side Lights Included		3.E. Total Count of Flashing Light Pairs 0			
3.F. Installation Date of Current Active Warning Devices: (MM/YYYY) _____/_____/_____ <input checked="" type="checkbox"/> Not Required		3.G. Wayside Horn <input type="checkbox"/> Yes   Installed on (MM/YYYY) ____/____/_____ <input type="checkbox"/> No		3.H. Highway Traffic Signals Controlling Crossing <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
3.I. Bells (count) 2		3.J. Non-Train Active Warning <input type="checkbox"/> Flagging/Flagman <input type="checkbox"/> Manually Operated Signals <input type="checkbox"/> Watchman <input type="checkbox"/> Floodlighting <input type="checkbox"/> None		3.K. Other Flashing Lights or Warning Devices Count 0   Specify type _____	
4.A. Does nearby Hwy Intersection have Traffic Signals? <input type="checkbox"/> Yes <input type="checkbox"/> No		4.B. Hwy Traffic Signal Interconnection <input type="checkbox"/> Not Interconnected <input type="checkbox"/> For Traffic Signals <input type="checkbox"/> For Warning Signs		4.C. Hwy Traffic Signal Preemption <input type="checkbox"/> Simultaneous <input type="checkbox"/> Advance	
5. Highway Traffic Pre-Signals <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Storage Distance * _____ Stop Line Distance * _____		6. Highway Monitoring Devices (Check all that apply) <input type="checkbox"/> Yes - Photo/Video Recording <input type="checkbox"/> Yes - Vehicle Presence Detection <input type="checkbox"/> None			
<b>Part IV: Physical Characteristics</b>					
1. Traffic Lanes Crossing Railroad Number of Lanes 2 <input type="checkbox"/> One-way Traffic <input type="checkbox"/> Two-way Traffic <input type="checkbox"/> Divided Traffic		2. Is Roadway/Pathway Paved? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3. Does Track Run Down a Street? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4. Is Crossing Illuminated? (Street lights within approx. 50 feet from nearest rail) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		5. Crossing Surface (on Main Track, multiple types allowed)   Installation Date * (MM/YYYY) ____/____/_____ <input checked="" type="checkbox"/> 1 Timber <input type="checkbox"/> 2 Asphalt <input type="checkbox"/> 3 Asphalt and Timber <input type="checkbox"/> 4 Concrete <input type="checkbox"/> 5 Concrete and Rubber <input type="checkbox"/> 6 Rubber <input type="checkbox"/> 7 Metal <input type="checkbox"/> 8 Unconsolidated <input type="checkbox"/> 9 Composite <input type="checkbox"/> 10 Other (specify) _____			
6. Intersecting Roadway within 500 feet? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   If Yes, Approximate Distance (feet) _____		7. Smallest Crossing Angle <input type="checkbox"/> 0° - 29° <input type="checkbox"/> 30° - 59° <input checked="" type="checkbox"/> 60° - 90°		8. Is Commercial Power Available? * <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Part V: Public Highway Information</b>					
1. Highway System  <input type="checkbox"/> (01) Interstate Highway System <input type="checkbox"/> (02) Other Nat Hwy System (NHS) <input type="checkbox"/> (03) Federal AID, Not NHS <input checked="" type="checkbox"/> (08) Non-Federal Aid		2. Functional Classification of Road at Crossing <input type="checkbox"/> (0) Rural <input checked="" type="checkbox"/> (1) Urban <input type="checkbox"/> (1) Interstate <input type="checkbox"/> (5) Major Collector <input type="checkbox"/> (2) Other Freeways and Expressways <input type="checkbox"/> (3) Other Principal Arterial <input type="checkbox"/> (6) Minor Collector <input checked="" type="checkbox"/> (4) Minor Arterial <input type="checkbox"/> (7) Local		3. Is Crossing on State Highway System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4. Highway Speed Limit _____ MPH <input type="checkbox"/> Posted <input type="checkbox"/> Statutory		5. Linear Referencing System (LRS Route ID) *			
6. LRS Milepost *		7. Annual Average Daily Traffic (AADT) Year 1989   AADT 5500			
8. Estimated Percent Trucks 05 %		9. Regularly Used by School Buses? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   Average Number per Day 0		10. Emergency Services Route <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Submission Information - This information is used for administrative purposes and is not available on the public website.</b>					
Submitted by _____ Organization _____ Phone _____ Date _____					
Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.					



# U. S. DOT CROSSING INVENTORY FORM

## DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk \* denotes an optional field.

<b>A. Revision Date</b> (MM/DD/YYYY) 11 / 12 / 2016	<b>B. Reporting Agency</b> <input checked="" type="checkbox"/> Railroad <input type="checkbox"/> Transit <input type="checkbox"/> State <input type="checkbox"/> Other	<b>C. Reason for Update (Select only one)</b> <input checked="" type="checkbox"/> Change in Data <input type="checkbox"/> Re-Open <input type="checkbox"/> New Crossing <input type="checkbox"/> Date Change Only <input type="checkbox"/> Closed <input type="checkbox"/> Change in Primary Operating RR <input type="checkbox"/> No Train Traffic <input type="checkbox"/> Quiet Zone Update <input type="checkbox"/> Admin. Correction	<b>D. DOT Crossing Inventory Number</b> 755155D
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### Part I: Location and Classification Information

<b>1. Primary Operating Railroad</b> Union Pacific Railroad Company [UP]		<b>2. State</b> CALIFORNIA		<b>3. County</b> SANTA CLARA	
<b>4. City / Municipality</b> <input type="checkbox"/> In <input checked="" type="checkbox"/> Near MORGAN HILL		<b>5. Street/Road Name &amp; Block Number</b> TILTON AVENUE (Street/Road Name)   * (Block Number)		<b>6. Highway Type &amp; No.</b> CITY	
<b>7. Do Other Railroads Operate a Separate Track at Crossing?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Specify RR			<b>8. Do Other Railroads Operate Over Your Track at Crossing?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Specify RR ATK		
<b>9. Railroad Division or Region</b> <input type="checkbox"/> None ROSEVILLE		<b>10. Railroad Subdivision or District</b> <input type="checkbox"/> None Coast		<b>11. Branch or Line Name</b> <input checked="" type="checkbox"/> None	
<b>12. RR Milepost</b> 0065.230 (prefix)   (nnnn.nnn)   (suffix)					
<b>13. Line Segment</b> *		<b>14. Nearest RR Timetable Station</b> *		<b>15. Parent RR (if applicable)</b> <input checked="" type="checkbox"/> N/A	
<b>16. Crossing Owner (if applicable)</b> <input checked="" type="checkbox"/> N/A					
<b>17. Crossing Type</b> <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private	<b>18. Crossing Purpose</b> <input checked="" type="checkbox"/> Highway <input type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.	<b>19. Crossing Position</b> <input checked="" type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over	<b>20. Public Access (if Private Crossing)</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>21. Type of Train</b> <input checked="" type="checkbox"/> Freight <input checked="" type="checkbox"/> Intercity Passenger <input type="checkbox"/> Commuter <input type="checkbox"/> Transit <input type="checkbox"/> Shared Use Transit <input type="checkbox"/> Tourist/Other	<b>22. Average Passenger Train Count Per Day</b> <input checked="" type="checkbox"/> Less Than One Per Day <input type="checkbox"/> Number Per Day
<b>23. Type of Land Use</b> <input type="checkbox"/> Open Space <input type="checkbox"/> Farm <input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard					
<b>24. Is there an Adjacent Crossing with a Separate Number?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Provide Crossing Number			<b>25. Quiet Zone (FRA provided)</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input type="checkbox"/> Chicago Excused Date Established		
<b>26. HSR Corridor ID</b> <input checked="" type="checkbox"/> N/A	<b>27. Latitude in decimal degrees</b> (WGS84 std: nn.nnnnnnn) 37.1549702		<b>28. Longitude in decimal degrees</b> (WGS84 std: -nnn.nnnnnnn) -121.6765074		<b>29. Lat/Long Source</b> <input checked="" type="checkbox"/> Actual <input type="checkbox"/> Estimated
<b>30.A. Railroad Use *</b>			<b>31.A. State Use *</b> 001E-65.20		
<b>30.B. Railroad Use *</b>			<b>31.B. State Use *</b>		
<b>30.C. Railroad Use *</b>			<b>31.C. State Use *</b>		
<b>30.D. Railroad Use *</b>			<b>31.D. State Use *</b>		
<b>32.A. Narrative (Railroad Use) *</b>			<b>32.B. Narrative (State Use) *</b>		
<b>33. Emergency Notification Telephone No. (posted)</b> 800-848-8715		<b>34. Railroad Contact (Telephone No.)</b> 402-544-3721		<b>35. State Contact (Telephone No.)</b> 415-703-3722	

### Part II: Railroad Information

<b>1. Estimated Number of Daily Train Movements</b>				
<b>1.A. Total Day Thru Trains (6 AM to 6 PM)</b> 5	<b>1.B. Total Night Thru Trains (6 PM to 6 AM)</b> 5	<b>1.C. Total Switching Trains</b> 2	<b>1.D. Total Transit Trains</b> 0	<b>1.E. Check if Less Than One Movement Per Day</b> <input type="checkbox"/> How many trains per week? _____
<b>2. Year of Train Count Data (YYYY)</b> 2016		<b>3. Speed of Train at Crossing</b> 3.A. Maximum Timetable Speed (mph) 79 3.B. Typical Speed Range Over Crossing (mph) From 30 to 60		
<b>4. Type and Count of Tracks</b> Main 1 Siding 0 Yard 0 Transit 0 Industry 0				
<b>5. Train Detection (Main Track only)</b> <input type="checkbox"/> Constant Warning Time <input type="checkbox"/> Motion Detection <input type="checkbox"/> AFO <input type="checkbox"/> PTC <input type="checkbox"/> DC <input checked="" type="checkbox"/> Other <input type="checkbox"/> None				
<b>6. Is Track Signaled?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.A. Event Recorder</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>7.B. Remote Health Monitoring</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

# U. S. DOT CROSSING INVENTORY FORM

A. Revision Date (MM/DD/YYYY) 11/12/2016		PAGE 2		D. Crossing Inventory Number (7 char.) 755155D	
<b>Part III: Highway or Pathway Traffic Control Device Information</b>					
1. Are there Signs or Signals?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2. Types of Passive Traffic Control Devices associated with the Crossing			
2.A. Crossbuck Assemblies (count) 0		2.B. STOP Signs (R1-1) (count) 0	2.C. YIELD Signs (R1-2) (count)	2.D. Advance Warning Signs (Check all that apply; include count) <input type="checkbox"/> None <input checked="" type="checkbox"/> W10-1 <input type="checkbox"/> W10-3 <input type="checkbox"/> W10-11 <input type="checkbox"/> W10-2 <input type="checkbox"/> W10-4 <input type="checkbox"/> W10-12	
2.E. Low Ground Clearance Sign (W10-5) <input type="checkbox"/> Yes (count 0) <input checked="" type="checkbox"/> No		2.F. Pavement Markings <input checked="" type="checkbox"/> Stop Lines <input type="checkbox"/> Dynamic Envelope <input checked="" type="checkbox"/> RR Xing Symbols <input type="checkbox"/> None		2.G. Channelization Devices/Medians <input checked="" type="checkbox"/> All Approaches <input checked="" type="checkbox"/> Median <input type="checkbox"/> One Approach <input type="checkbox"/> None	
2.H. EXEMPT Sign (R15-3) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		2.I. ENS Sign (I-13) Displayed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
2.J. Other MUTCD Signs  Specify Type _____ Count 2 Specify Type _____ Count 1 Specify Type _____ Count _____		2.K. Private Crossing Signs (if private)  <input type="checkbox"/> Yes <input type="checkbox"/> No		2.L. LED Enhanced Signs (List types)	
<b>3. Types of Train Activated Warning Devices at the Grade Crossing (specify count of each device for all that apply)</b>					
3.A. Gate Arms (count)  Roadway 2 Pedestrian _____		3.B. Gate Configuration <input type="checkbox"/> 2 Quad <input type="checkbox"/> Full (Barrier) <input type="checkbox"/> 3 Quad   Resistance <input type="checkbox"/> 4 Quad   Median Gates		3.C. Cantilevered (or Bridged) Flashing Light Structures (count) Over Traffic Lane 1 <input type="checkbox"/> Incandescent Not Over Traffic Lane 0 <input type="checkbox"/> LED	
3.D. Mast Mounted Flashing Lights (count of masts) 0 <input type="checkbox"/> Incandescent <input type="checkbox"/> LED <input type="checkbox"/> Back Lights Included <input type="checkbox"/> Side Lights Included		3.E. Total Count of Flashing Light Pairs  7			
3.F. Installation Date of Current Active Warning Devices: (MM/YYYY) _____/_____/_____ <input checked="" type="checkbox"/> Not Required		3.G. Wayside Horn  <input type="checkbox"/> Yes   Installed on (MM/YYYY) ____/____/_____ <input type="checkbox"/> No		3.H. Highway Traffic Signals Controlling Crossing  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
3.I. Bells (count)  2		3.J. Non-Train Active Warning <input type="checkbox"/> Flagging/Flagman <input type="checkbox"/> Manually Operated Signals <input type="checkbox"/> Watchman <input type="checkbox"/> Floodlighting <input type="checkbox"/> None			
3.K. Other Flashing Lights or Warning Devices Count 0   Specify type _____					
4.A. Does nearby Hwy Intersection have Traffic Signals?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		4.B. Hwy Traffic Signal Interconnection <input type="checkbox"/> Not Interconnected <input checked="" type="checkbox"/> For Traffic Signals <input type="checkbox"/> For Warning Signs		4.C. Hwy Traffic Signal Preemption <input checked="" type="checkbox"/> Simultaneous <input type="checkbox"/> Advance	
5. Highway Traffic Pre-Signals  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  Storage Distance * _____ Stop Line Distance * _____		6. Highway Monitoring Devices (Check all that apply) <input type="checkbox"/> Yes - Photo/Video Recording <input type="checkbox"/> Yes - Vehicle Presence Detection <input type="checkbox"/> None			
<b>Part IV: Physical Characteristics</b>					
1. Traffic Lanes Crossing Railroad  Number of Lanes 3  <input type="checkbox"/> One-way Traffic <input type="checkbox"/> Two-way Traffic <input type="checkbox"/> Divided Traffic		2. Is Roadway/Pathway Paved?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3. Does Track Run Down a Street?  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4. Is Crossing Illuminated? (Street lights within approx. 50 feet from nearest rail) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
5. Crossing Surface (on Main Track, multiple types allowed)   Installation Date * (MM/YYYY) ____/____/_____ <input type="checkbox"/> 1 Timber <input type="checkbox"/> 2 Asphalt <input type="checkbox"/> 3 Asphalt and Timber <input type="checkbox"/> 4 Concrete <input checked="" type="checkbox"/> 5 Concrete and Rubber <input type="checkbox"/> 6 Rubber <input type="checkbox"/> 7 Metal <input type="checkbox"/> 8 Unconsolidated <input type="checkbox"/> 9 Composite <input type="checkbox"/> 10 Other (specify) _____					
6. Intersecting Roadway within 500 feet?  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   If Yes, Approximate Distance (feet) 75		7. Smallest Crossing Angle  <input type="checkbox"/> 0° - 29° <input type="checkbox"/> 30° - 59° <input checked="" type="checkbox"/> 60° - 90°		8. Is Commercial Power Available? *  <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Part V: Public Highway Information</b>					
1. Highway System  <input type="checkbox"/> (01) Interstate Highway System <input type="checkbox"/> (02) Other Nat Hwy System (NHS) <input checked="" type="checkbox"/> (03) Federal AID, Not NHS <input type="checkbox"/> (08) Non-Federal Aid		2. Functional Classification of Road at Crossing <input type="checkbox"/> (0) Rural <input checked="" type="checkbox"/> (1) Urban <input type="checkbox"/> (1) Interstate <input checked="" type="checkbox"/> (5) Major Collector <input type="checkbox"/> (2) Other Freeways and Expressways <input type="checkbox"/> (3) Other Principal Arterial <input type="checkbox"/> (6) Minor Collector <input type="checkbox"/> (4) Minor Arterial <input type="checkbox"/> (7) Local		3. Is Crossing on State Highway System?  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
4. Highway Speed Limit _____ MPH  <input type="checkbox"/> Posted <input type="checkbox"/> Statutory		5. Linear Referencing System (LRS Route ID) *			
6. LRS Milepost *					
7. Annual Average Daily Traffic (AADT) Year 2009   AADT 25		8. Estimated Percent Trucks 05 %		9. Regularly Used by School Buses?  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   Average Number per Day 0	
10. Emergency Services Route  <input type="checkbox"/> Yes <input type="checkbox"/> No					
<b>Submission Information - This information is used for administrative purposes and is not available on the public website.</b>					
Submitted by _____ Organization _____ Phone _____ Date _____  Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.					

## Appendix C – At-Grade Crossing Accident Data

## HIGHWAY-RAIL GRADE CROSSING

## ACCIDENT/INCIDENT REPORT

DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION (FRA)

OMB Approval No. 2130-0500

Name Of				Alphabetic Code		RR Accident/Incident No.	
1. Reporting Railroad <b>Southern Pacific Transportation Company [SP]</b>				1a. <b>SP</b>		1b. <b>30698</b>	
2. Other Railroad Involved in Train Accident/Incident				2a.		2b.	
3. Railroad Responsible for Track Maintenance <b>Southern Pacific Transportation Company [SP]</b>				3a. <b>SP</b>		3b. <b>30698</b>	
4. U.S. DOT-AAR Grade Crossing ID No. <b>755162N</b>				5. Date of Accident/Incident <b>05/16/78</b>		6. Time of Accident/Incident <b>12:15 AM</b>	
7. Nearest Railroad Station <b>MORGAN HILL</b>			8. Division		9. County <b>SANTA CLARA</b>		10. State Abbr. <b>06</b> Code <b>CA</b>
11. City (if in a city) <b>MORGAN HILL</b>			12. Highway Name or No. <b>E DUNNE</b>				<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Highway User Involved				Rail Equipment Involved			
13. Type C. Truck-trailer F. Bus J. Other Motor Vehicle Code A. Auto D. Pick-up truck G. School Bus K. Pedestrian B. Truck E. Van H. Motorcycle M. Other (specify) <b>A</b>				17. Equipment 4. Car(s) (moving) 8. Other (specify) Code 1. Train (units pulling) 5. Car(s) (standing) A. Train pulling- RCL 2. Train (units pushing) 6. Light loco(s) (moving) B. Train pushing- RCL 3. Train (standing) 7. Light loco(s) (standing) C. Train standing- RCL <b>1</b>			
14. Vehicle Speed (est. mph at impact) <b>0</b>		15. Direction (geographical) 1. North 2. South 3. East 4. West <b>4</b>		18. Position of Car Unit in Train <b>1</b>			
16. Position 1. Stalled on crossing 3. Moving over crossing 2. Stopped on Crossing 4. Trapped <b>2</b>		Code		19. Circumstance 1. Rail equipment struck highway user 2. Rail equipment struck by highway user <b>1</b>			
20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither <b>4</b>		Code		20b. Was there a hazardous materials release by 1. Highway User 2. Rail Equipment 3. Both 4. Neither			
20c. State the name and quantity of the hazardous material released, if any							
21. Temperature (specify if minus) <b>54</b> °F		22. Visibility (single entry) Code 1. Dawn 2. Day 3. Dusk 4. Dark <b>4</b>		23. Weather (single entry) Code 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow <b>1</b>			
24. Type of Equipment A. Spec. MoW Equip Consist 1. Freight train 4. Work train 7. Yard/Switching (single entry) 2. Passenger train 5. Single car 8. Light loco(s) 3. Commuter train 6. Cut of cars 9. Main./inspect. car <b>1</b>				25. Track Type Used by Rail Equipment Involved Code 1. Main 2. Yard 3. Siding 4. Industry <b>1</b>		26. Track Number or Name <b>MAINLINE</b>	
27. FRA Track Class <b>2</b>		28. Number of Locomotive Units <b>2</b>		29. Number of Cars <b>81</b>		30. Consist Speed (Recorded if available) Code R. Recorded <b>21</b> mph E. Estimated <b>E</b>	
31. Time Table Direction 1. North 2. South 3. East 4. West <b>3</b>		Code		32. Type of Crossing 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (specify) Warning 3. Standard FLS 6. Audible 9. Watchman 12. None			
33. Signaled Crossing Warning <b>20 sec warn min (1);</b>		34. Whistle Ban 1. Yes 2. No 3. Unknown		Code			
35. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach <b>1</b>		Code		36. Crossing Warning Interconnected with Highway Signals 1. Yes 2. No 3. Unknown <b>2</b>		37. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown <b>2</b>	
38. Driver's Age		39. Driver's Gender 1. Male 2. Female		40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown <b>2</b>		41. Driver 1. Drove around or thru the gate 4. Stopped on crossing 2. Stopped and then proceeded 5. Other (specify) 3. Did not stop <b>5</b>	
42. Driver Passed Standing Highway Vehicle 1. Yes 2. No 3. Unknown <b>2</b>		Code		43. View of Track Obscured by (primary obstruction) 1. Permanent Structure 3. Passing Train 5. Vegetation 7. Other (specify) 2. Standing railroad equipment 4. Topography 6. Highway Vehicles 8. Not Obstructed <b>8</b>			
Casualties to:		Killed	Injured	44. Driver was 1. Killed 2. Injured 3. Uninjured		45. Was Driver in the Vehicle? 1. Yes 2. No <b>2</b>	
46. Highway-Rail Crossing Users <b>0</b>		<b>0</b>	47. Highway Vehicle Property Damage (est. dollar damage) <b>\$150</b>		48. Total Number of Highway-Rail Crossing Users (include driver) <b>0</b>		
49. Railroad Employees <b>0</b>		<b>0</b>	50. Total Number of People on Train (include passengers and crew)		51. Is a Rail Equipment Accident / Incident Report Being Filed 1. Yes 2. No <b>2</b>		
52. Passengers on Train <b>0</b>		<b>0</b>					
53a. Special Study Block				53b. Special Study Block			
54. Narrative Description							
55. Typed Name and Title			56. Signature				57. Date

## HIGHWAY-RAIL GRADE CROSSING

## ACCIDENT/INCIDENT REPORT

DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION (FRA)

OMB Approval No. 2130-0500

Name Of				Alphabetic Code		RR Accident/Incident No.	
1. Reporting Railroad <b>Southern Pacific Transportation Company [SP]</b>				1a. <b>SP</b>		1b. <b>28956</b>	
2. Other Railroad Involved in Train Accident/Incident				2a.		2b.	
3. Railroad Responsible for Track Maintenance				3a.		3b.	
4. U.S. DOT-AAR Grade Crossing ID No. <b>755162N</b>		5. Date of Accident/Incident <b>05/17/76</b>		6. Time of Accident/Incident <b>06:40 AM</b>			
7. Nearest Railroad Station <b>MORGAN HILL</b>		8. Division		9. County <b>SANTA CLARA</b>		10. State Abbr. <b>06</b> Code <b>CA</b>	
11. City (if in a city) <b>MORGAN HILL</b>		12. Highway Name or No. <b>E DUNNE ST</b>		<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private			
Highway User Involved				Rail Equipment Involved			
13. Type C. Truck-trailer F. Bus J. Other Motor Vehicle Code A. Auto D. Pick-up truck G. School Bus K. Pedestrian B. Truck E. Van H. Motorcycle M. Other (specify) <b>B</b>				17. Equipment 4. Car(s) (moving) 8. Other (specify) Code 1. Train (units pulling) 5. Car(s) (standing) A. Train pulling- RCL 2. Train (units pushing) 6. Light loco(s) (moving) B. Train pushing- RCL 3. Train (standing) 7. Light loco(s) (standing) C. Train standing- RCL <b>8</b>			
14. Vehicle Speed (est. mph at impact) <b>15</b>		15. Direction (geographical) Code 1. North 2. South 3. East 4. West <b>4</b>		18. Position of Car Unit in Train <b>1</b>			
16. Position 1. Stalled on crossing 3. Moving over crossing Code 2. Stopped on Crossing 4. Trapped <b>3</b>		19. Circumstance 1. Rail equipment struck highway user Code 2. Rail equipment struck by highway user <b>2</b>					
20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? Code 1. Highway User 2. Rail Equipment 3. Both 4. Neither <b>4</b>		20b. Was there a hazardous materials release by Code 1. Highway User 2. Rail Equipment 3. Both 4. Neither					
20c. State the name and quantity of the hazardous material released, if any							
21. Temperature (specify if minus) <b>68</b> °F		22. Visibility (single entry) Code 1. Dawn 2. Day 3. Dusk 4. Dark <b>1</b>		23. Weather (single entry) Code 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow <b>1</b>			
24. Type of Equipment Consist 1. Freight train 4. Work train 7. Yard/Switching (single entry) 2. Passenger train 5. Single car 8. Light loco(s) Code 3. Commuter train 6. Cut of cars 9. Main./inspect. car <b>7</b>		25. Track Type Used by Rail Equipment Involved Code 1. Main 2. Yard 3. Siding 4. Industry <b>1</b>		26. Track Number or Name <b>MAIN LINE</b>			
27. FRA Track Class <b>4</b>		28. Number of Locomotive Units <b>0</b>		29. Number of Cars <b>1</b>		30. Consist Speed (Recorded if available) Code R. Recorded <b>15</b> mph E. Estimated <b>E</b>	
31. Time Table Direction Code 1. North 2. South 3. East 4. West <b>3</b>		32. Type of Crossing 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew Warning 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (specify) 3. Standard FLS 6. Audible 9. Watchman 12. None		33. Signaled Crossing Warning		34. Whistle Ban Code 1. Yes 2. No 3. Unknown	
Code(s) <b>01</b> <b>07</b>				<b>Allgd. no warn (4);</b>			
35. Location of Warning Code 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach <b>1</b>		36. Crossing Warning Interconnected with Highway Signals Code 1. Yes 2. No 3. Unknown <b>2</b>		37. Crossing Illuminated by Street Lights or Special Lights Code 1. Yes 2. No 3. Unknown <b>1</b>			
38. Driver's Age		39. Driver's Gender Code 1. Male 2. Female		40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train Code 1. Yes 2. No 3. Unknown <b>2</b>		41. Driver Code 1. Drove around or thru the gate 4. Stopped on crossing 2. Stopped and then proceeded 5. Other (specify) 3. Did not stop <b>5</b>	
42. Driver Passed Standing Highway Vehicle Code 1. Yes 2. No 3. Unknown <b>2</b>		43. View of Track Obscured by (primary obstruction) Code 1. Permanent Structure 3. Passing Train 5. Vegetation 7. Other (specify) 2. Standing railroad equipment 4. Topography 6. Highway Vehicles 8. Not Obstructed <b>8</b>					
Casualties to:		Killed	Injured	44. Driver was Code 1. Killed 2. Injured 3. Uninjured <b>3</b>		45. Was Driver in the Vehicle? Code 1. Yes 2. No <b>1</b>	
46. Highway-Rail Crossing Users <b>0</b>		<b>0</b>	47. Highway Vehicle Property Damage (est. dollar damage) <b>\$200</b>		48. Total Number of Highway-Rail Crossing Users (include driver) <b>1</b>		
49. Railroad Employees <b>0</b>		<b>0</b>	50. Total Number of People on Train (include passengers and crew)		51. Is a Rail Equipment Accident / Incident Report Being Filed Code 1. Yes 2. No <b>2</b>		
52. Passengers on Train <b>0</b>		<b>0</b>					
53a. Special Study Block				53b. Special Study Block			
54. Narrative Description							
55. Typed Name and Title		56. Signature				57. Date	

## HIGHWAY-RAIL GRADE CROSSING

DEPARTMENT OF TRANSPORTATION  
FEDERAL RAILROAD ADMINISTRATION (FRA)

## ACCIDENT/INCIDENT REPORT

OMB Approval No. 2130-0500

Name Of						Alphabetic Code		RR Accident/Incident No.	
1. Reporting Railroad Amtrak (National Railroad Passenger Corporation)						1a. ATK		1b. 102409	
2. Other Railroad Involved in Train Accident/Incident						2a.		2b.	
3. Railroad Responsible for Track Maintenance Union Pacific Railroad Company [UP]						3a. UP		3b. XXX	
4. U.S. DOT-AAR Grade Crossing ID No. 755155D				5. Date of Accident/Incident 10/12/06		6. Time of Accident/Incident 08:32 PM			
7. Nearest Railroad Station SAN JOSE				8. Division PAC		9. County SANTA CLARA		10. State Abbr. 06 Code CA	
11. City (if in a city) MORGAN HILL				12. Highway Name or No. CITY : TILTON AVE					
				<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private					
Highway User Involved					Rail Equipment Involved				
13. Type C. Truck-trailer F. Bus J. Other Motor Vehicle Code A. Auto D. Pick-up truck G. School Bus K. Pedestrian B. Truck E. Van H. Motorcycle M. Other (specify) B					17. Equipment 4. Car(s) (moving) 8. Other (specify) Code 1. Train (units pulling) 5. Car(s) (standing) A. Train pulling- RCL 2. Train (units pushing) 6. Light loco(s) (moving) B. Train pushing- RCL 3. Train (standing) 7. Light loco(s) (standing) C. Train standing- RCL 1				
14. Vehicle Speed (est. mph at impact) 25		15. Direction (geographical) 1. North 2. South 3. East 4. West 1		18. Position of Car Unit in Train 1					
16. Position 1. Stalled on crossing 3. Moving over crossing 2. Stopped on Crossing 4. Trapped Code 3				19. Circumstance 1. Rail equipment struck highway user Code 2. Rail equipment struck by highway user 1					
20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither Code 4				20b. Was there a hazardous materials release by 1. Highway User 2. Rail Equipment 3. Both 4. Neither Code 4					
20c. State the name and quantity of the hazardous material released, if any									
21. Temperature (specify if minus) 65 °F		22. Visibility (single entry) Code 1. Dawn 2. Day 3. Dusk 4. Dark 4		23. Weather (single entry) Code 1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow 1					
24. Type of Equipment Consist 1. Freight train 4. Work train 7. Yard/Switching (single entry) 2. Passenger train 5. Single car 8. Light loco(s) Code 3. Commuter train 6. Cut of cars 9. Main./inspect. car 2				25. Track Type Used by Rail Equipment Involved Code 1. Main 2. Yard 3. Siding 4. Industry 1		26. Track Number or Name MAIN			
27. FRA Track Class 4		28. Number of Locomotive Units 2		29. Number of Cars 10		30. Consist Speed (Recorded if available) Code R. Recorded 5 mph E. Estimated E		31. Time Table Direction Code 1. North 2. South 3. East 4. West 1	
32. Type of Crossing 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (specify) Warning 3. Standard FLS 6. Audible 9. Watchman 12. None		33. Signaled Crossing Warning 20 sec warn min (1);		34. Whistle Ban Code 1. Yes 2. No 3. Unknown 2					
35. Location of Warning Code 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach 1		36. Crossing Warning Interconnected with Highway Signals Code 1. Yes 2. No 3. Unknown 1		37. Crossing Illuminated by Street Lights or Special Lights Code 1. Yes 2. No 3. Unknown 1					
38. Driver's Age 40		39. Driver's Gender Code 1. Male 1 2. Female		40. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train Code 1. Yes 2. No 3. Unknown 2		41. Driver Code 1. Drove around or thru the gate 4. Stopped on crossing 2. Stopped and then proceeded 5. Other (specify) 3. Did not stop 1			
42. Driver Passed Standing Highway Vehicle Code 1. Yes 2. No 3. Unknown 2		43. View of Track Obscured by (primary obstruction) Code 1. Permanent Structure 3. Passing Train 5. Vegetation 7. Other (specify) 2. Standing railroad equipment 4. Topography 6. Highway Vehicles 8. Not Obstructed 8							
Casualties to:		Killed	Injured	44. Driver was Code 1. Killed 2. Injured 3. Uninjured 1		45. Was Driver in the Vehicle? Code 1. Yes 2. No 1			
46. Highway-Rail Crossing Users		1	0	47. Highway Vehicle Property Damage (est. dollar damage) \$3,000		48. Total Number of Highway-Rail Crossing Users (include driver) 1			
49. Railroad Employees		0	0	50. Total Number of People on Train (include passengers and crew) 185		51. Is a Rail Equipment Accident / Incident Report Being Filed Code 1. Yes 2. No 1			
52. Passengers on Train		0	0						
53a. Special Study Block					53b. Special Study Block				
54. Narrative Description TRAIN NO.#14 OPERATING WITH LOCOMOTIVES 114/507 AND 10 CARS STRUCK A TRUCK AT MP65.3, TILTON AVE CROSSING.									
55. Typed Name and Title			56. Signature					57. Date	

## Appendix D - Quiet Zone Calculator Results



[Home](#) | [Help](#) | [Contact](#) | [logoff don.sepulveda@mbakerintl.com](#)


Change Scenario: MORGAN HIL\_49751 ▼

[Create New Zone](#)  
[Manage Existing Zones](#)  
[Log Off](#)

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
755155D	TILTON AVENUE	25	Gates	13	6	1,857.81	<input type="button" value="MODIFY"/>
755159F	EAST MAIN AVENUE	5500	Gates	0	6	7,231.32	<input type="button" value="MODIFY"/>
755162N	EAST DUNNE AVENUE	15000	Gates	13	0	37,016.64	<input type="button" value="MODIFY"/>
920463M	MORGAN HILL PED X	0	Gates	0	0	144.28	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the SELECT button

\* Only Public At Grade Crossings are listed.

[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	Morgan Hill
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	MORGAN HIL_49751
<b>Estimated Total Cost:</b>	\$256,000.00
<b>Nationwide Significant Risk Threshold:</b>	14347 .00
<b>Risk Index with Horns:</b>	38527.46
<b>Quiet Zone Risk Index:</b>	<b>11562.51</b>
<input type="button" value="Select"/>	

## Appendix E - Conceptual Cost Estimate

City of Morgan Hill

Cost Estimate  
At-Grade Crossing Design  
Summary

East Dunne Avenue			
	Civil Work	\$ 359,434	
	Signal Work	\$ 151,600	
	Total		\$ 511,034
Morgan Hill Train Station Pedestrian Crossing			
	Civil Work	\$ 29,044	
	Signal Work	\$ 95,900	
	Total		\$ 124,944
East Main Street			
	Civil Work	\$ 260,955	
	Signal Work	\$ 440,780	
	Total		\$ 701,735
Tilton Avenue			
	Civil Work	\$ 239,335	
	Signal Work	\$ 440,495	
	Total		\$ 679,830
Totals			
	Subtotal		\$ 2,017,543
	Contingency	30%	\$ 605,263
	Total		\$ 2,622,805
	Mobilization and Demobilization	10%	\$ 262,280.53
	Agency Costs	8%	\$ 209,824.42
	Engineering (Civil)	10%	\$ 262,280.53
	Engineering (Railroad)	10%	\$ 112,877.50
	Permitting	5%	\$ 131,140.26
			\$ 4,206,471

City of Morgan Hill  
East Dunne Avenue

Cost Estimate  
At-Grade Crossing Design

Roadway Cost

Demolish and Remove		Unit	Quantity	Unit Cost	Cost	Total
	Median	SY	0	\$ 14	\$ -	
	Asphalt Paving	SY	815	\$ 12	\$ 9,780	
	Crossing Panel	TF	114	\$ 45	\$ 5,130	
	Curb and Gutter	LF	90	\$ 6.25	\$ 563	
	Curb Ramp	EA	0	\$ 1,000	\$ -	
	Detectable Warning Strip	LF	0	\$ 10	\$ -	
	Sidewalk	SY	145	\$ 6.25	\$ 906	
	Landscaped Area	SY	0	\$ 2.50	\$ -	
	Chain Link Fence	LF	0	\$ 6.25	\$ -	
	Pedestrian Railing	LF	0	\$ 25	\$ -	
	Signing and Striping	SF	0	\$ 3.50	\$ -	
Subtotal						\$ 16,379

Roadway Cost

Construct		Unit	Quantity	Unit Cost	Cost	Total
	Median	LF	0	\$ 375	\$ -	
	Asphalt Paving (4")	SF	815	\$ 37	\$ 30,155	
	Crossing Panel	TF	130	\$ 1,500	\$ 195,000	
	Curb and Gutter	LF	90	\$ 25	\$ 2,250	
	Curb Ramp	EA	0	\$ 6,200	\$ -	
	Detectable Warning Strip	SF	100	\$ 25	\$ 2,500	
	Sidewalk	SF	1280	\$ 65	\$ 83,200	
	Landscaped Area	SF	0	\$ 50	\$ -	
	Chain Link Fence	LF	0	\$ 150	\$ -	
	4' High Welded Wire Fence	LF	0	\$ 150	\$ -	
	Pedestrian Railing	LF	50	\$ 150	\$ 7,500	
	Pedestrian Swing Gate	EA	4	\$ 2,500	\$ 10,000	
	Retaining Wall	LS	1	\$ 10,000	\$ 10,000	
	W10-9P Sign	EA	2	\$ 100	\$ 200	
	Signing and Striping	LF	90	\$ 25	\$ 2,250	
Subtotal						\$ 343,055

Signal		Unit	Quantity	Unit Cost	Cost	Total
	Exit Gates and Gate Management System	EA	0	\$ 128,000	\$ -	
	Pedestrian Gate	EA	4	\$ 25,000	\$ 100,000	
	Conduit	LF	400	\$ 19	\$ 7,600	
	Additional Track Circuitry	EA	1	\$ 44,000	\$ 44,000	
	System Integrated					
	Preemption	EA	0	\$ 33,000	\$ -	
	Exit Gate Detection	EA	0	\$ 16,400	\$ -	
Subtotal						\$ 151,600
Subtotal (all categories)						\$ 511,034
Contingency			30%			\$ 153,310
Total						\$ 664,344

City of Morgan Hill  
Morgan Hill Train Station Pedestrian Crossing

Cost Estimate  
At-Grade Crossing Design

Civil Cost

Demolish and Remove		Unit	Quantity	Unit Cost	Cost	Total
	Median	SY	0	\$ 14	\$ -	
	Asphalt Paving	SY	0	\$ 12	\$ -	
	Crossing Panel	TF	0	\$ 45	\$ -	
	Curb and Gutter	LF	0	6.25	\$ -	
	Curb Ramp	EA	0	\$ 1,000	\$ -	
	Detectable Warning Strip	LF	0	\$ 10	\$ -	
	No. 8 Signal	EA	4	\$ 625	\$ 2,500	
	Sidewalk	SY	35	\$ 6.25	\$ 219	
	Swing Gate	EA	2	\$ 100	\$ 200	
	Landscaped Area	SY	0	\$ 2.50	\$ -	
	Chain Link Fence	LF	0	\$ 6.25	\$ -	
	Pedestrian Railing	LF	0	\$ 25	\$ -	
	Signing and Striping	SF	0	\$ 3.50	\$ -	
Subtotal						\$ 2,919

Roadway Cost

Construct		Unit	Quantity	Unit Cost	Cost	Total
	Median	LF	0	\$ 375		
	Asphalt Paving (4")	SF	0	\$ 37	\$ -	
	Crossing Panel	TF	0	\$ 1,500	\$ -	
	Curb and Gutter	LF	0	\$ 25	\$ -	
	Curb Ramp	EA	0	\$ 6,200	\$ -	
	Detectable Warning Strip	SF	55	\$ 25	\$ 1,375	
	Sidewalk	SF	300	\$ 65	\$ 19,500	
	4' High Welded Wire Fence	LF	15	\$ 150	\$ 2,250	
	Landscaped Area	SF	0	\$ 50	\$ -	
	Chain Link Fence	LF	0	\$ 150	\$ -	
	Pedestrian Railing	LF	20	\$ 150	\$ 3,000	
	Pedestrian Swing Gate	EA	0	\$ 2,500	\$ -	
	Signing and Striping	LF	0	\$ 25	\$ -	
Subtotal						\$ 26,125

Signal		Unit	Quantity	Unit Cost	Cost	Total
	Exit Gates and Gate Management System	EA	0	\$ 128,000	\$ -	
	Conduit	LF	100	\$ 19	\$ 1,900	
	Additional Track Circuitry	EA	1	\$ 44,000	\$ 44,000	
	Pedestrian Gate	EA	2	\$ 25,000	\$ 50,000	
	System Integrated Preemption	EA	0	\$ 33,000	\$ -	
	Exit Gate Detection	EA	0	\$ 16,400	\$ -	
Subtotal						\$ 95,900
Subtotal (all categories)						\$ 124,944
Contingency			30%			\$ 37,483
Total						\$ 162,427

City of Morgan Hill  
East Main Street

Cost Estimate  
At-Grade Crossing Design

Roadway Cost

Demolish and Remove		Unit	Quantity	Unit Cost	Cost	Total
	Median	SY	0	\$ 14	\$ -	
	Asphalt Paving	SY	770	\$ 12	\$ 9,240	
	Crossing Panel	TF	0	\$ 45	\$ -	
	Curb and Gutter	LF	105	\$ 6.25	\$ 656	
	Curb Ramp	EA	0	\$ 1,000	\$ -	
	Detectable Warning Strip	LF	0	\$ 10	\$ -	
	Sidewalk	SY	195	\$ 6.25	\$ 1,219	
	Landscaped Area	SY	0	\$ 2.50	\$ -	
	Chain Link Fence	LF	0	\$ 6.25	\$ -	
	Pedestian Railing	LF	0	\$ 25	\$ -	
	Signing and Striping	SF	0	\$ 3.50	\$ -	
Subtotal						\$ 11,115

Civil Cost

Construct		Unit	Quantity	Unit Cost	Cost	Total
	Median	LF	0	\$ 375	\$ -	
	Asphalt Paving (4")	SF	770	\$ 37	\$ 28,490	
	Crossing Panel	TF	16	\$ 1,500	\$ 24,000	
	Curb and Gutter	LF	105	\$ 25	\$ 2,625	
	Curb Ramp	EA	2	\$ 6,200	\$ 12,400	
	Detectable Warning Strip	SF	100	\$ 25	\$ 2,500	
	Sidewalk	SF	1725	\$ 65	\$ 112,125	
	4' High Welded Wire Fence	LF	310	\$ 150	\$ 46,500	
	Landscaped Area	SF	0	\$ 50	\$ -	
	Chain Link Fence	LF	0	\$ 150	\$ -	
	Pedestian Railing	LF	60	\$ 150	\$ 9,000	
	W10-9P Sign	EA	2	\$ 100	\$ 200	
	Pedestrian Swing Gate	EA	4	\$ 2,500	\$ 10,000	
	Signing and Striping	LF	80	\$ 25	\$ 2,000	
Subtotal						\$ 249,840

Signal		Unit	Quantity	Unit Cost	Cost	Total
	Exit Gates and Gate Management System	EA	2	\$ 128,000	\$ 256,000	
	Conduit	LF	420	\$ 19	\$ 7,980	
	Additional Track Circuitry	EA	1	\$ 44,000	\$ 44,000	
	Pedestrian Gate	EA	4	\$ 25,000	\$ 100,000	
	System Integrated Preemption	EA	0	\$ 33,000	\$ -	
	Exit Gate Detection	EA	2	\$ 16,400	\$ 32,800	
Subtotal						\$ 440,780
Subtotal (all categories)						\$ 701,735
Contingency			30%			\$ 210,521
Total						\$ 912,256

City of Morgan Hill  
Tilton Avenue

Cost Estimate  
At-Grade Crossing Design

Roadway Cost

Demolish and Remove		Unit	Quantity	Unit Cost	Cost	Total
	Median	SY	0	\$ 14	\$ -	
	Asphalt Paving	SY	740	\$ 12	\$ 8,880	
	Crossing Panel	TF	0	\$ 45	\$ -	
	Curb and Gutter	LF	95	\$ 6.25	\$ 594	
	Curb Ramp	EA	0	\$ 1,000	\$ -	
	Detectable Warning Strip	LF	0	\$ 10	\$ -	
	Sidewalk	SY	145	\$ 6.25	\$ 906	
	Landscaped Area	SY	0	\$ 2.50	\$ -	
	Chain Link Fence	LF	0	\$ 6.25	\$ -	
	Pedestrian Railing	LF	0	\$ 25	\$ -	
	Signing and Striping	SF	0	\$ 3.50	\$ -	
Subtotal						\$ 10,380

Roadway Cost

Construct		Unit	Quantity	Unit Cost	Cost	Total
	Median	LF	0	\$ 375	\$ -	
	Asphalt Paving (4")	SF	740	\$ 37	\$ 27,380	
	Crossing Panel	TF	16	\$ 1,500	\$ 24,000	
	Curb and Gutter	LF	95	\$ 25	\$ 2,375	
	Curb Ramp	EA	2	\$ 6,200	\$ 12,400	
	Detectable Warning Strip	SF	100	\$ 25	\$ 2,500	
	Sidewalk	SF	1290	\$ 65	\$ 83,850	
	4' High Welded Wire Fence	LF	305	\$ 150	\$ 45,750	
	Landscaped Area	SF	0	\$ 50	\$ -	
	Chain Link Fence	LF	0	\$ 150	\$ -	
	Pedestrian Railing	LF	55	\$ 150	\$ 8,250	
	Retaining Wall	LS	1	\$ 10,000	\$ 10,000	
	W10-9P Sign	EA	2	\$ 100	\$ 200	
	Pedestrian Swing Gate	EA	4	\$ 2,500	\$ 10,000	
	Signing and Striping	LF	90	\$ 25	\$ 2,250	
Subtotal						\$ 228,955

Signal		Unit	Quantity	Unit Cost	Cost	Total
	Exit Gates and Gate Management System	EA	2	\$ 128,000	\$ 256,000	
	Conduit	LF	405	\$ 19	\$ 7,695	
	Additional Track Circuitry	EA	1	\$ 44,000	\$ 44,000	
	Pedestrian Gate	EA	4	\$ 25,000	\$ 100,000	
	System Integrated Preemption	EA	0	\$ 33,000	\$ -	
	Exit Gate Detection	EA	2	\$ 16,400	\$ 32,800	
Subtotal						\$ 440,495
Subtotal (all categories)						\$ 679,830
Contingency			30%			\$ 203,949
Total						\$ 883,779



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