3.11 Safety and Security

Since publication of the Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS), the following substantive changes have been made to this section:

- Section 3.11.2.1 was revised to add the publication date of the Federal Railroad Administration's (FRA) final rule requiring commuter and intercity passenger railroads to develop and implement a system safety program (SSP) to improve operational safety, to address comments on Federal Aviation Regulation (FAR) 14 Code of Federal Regulations (C.F.R.) Part 77 (FAR Part 77), and to add California Public Utilities Commission (CPUC) General Order No. 75-D, Regulations Governing Standards for Warning Devices for At-Grade Highway-Rail Crossings in the State of California.
- Section 3.11.2.2, State, under the McAteer-Petris Act (California Government Code § 66600 et seq.) subsection, was revised to clarify the conditions under which the San Francisco Bay Conservation and Development Commission (BCDC) is authorized to issue permits for fill in the San Francisco Bay.
- Section 3.11.5.1, Emergency Services and Response, and Impact S&S#6 were revised to acknowledge the City of San Jose's emergency vehicle preemption (EVP) and its applicability to the San Francisco to San Jose Project Section (Project Section, or project).
- Section 3.11.5.2, Community Safety and Security, was updated to provide additional information on current safety features (median channelization and traffic signal preemption) at existing at-grade crossings, to clarify federal requirements governing airport obstructions and state requirements governing airport-compatible land use planning, to clarify that the analysis used the online FAR Part 77 Notice Criteria Tool to assess Federal Aviation Administration (FAA) notification requirements for construction of the project alternatives, to remove safety improvements at the Atherton Caltrain Station because it closed in 2020, and to update the number of high-risk utilities in the resource study area (RSA) under both project alternatives. In addition, revisions were made to reflect Caltrain's December 2020 completion of the installation of positive train control (PTC) throughout the Caltrain corridor.
- Analysis of the Diridon Design Variant (DDV), which was included in Section 3.19, Design Variant to Optimize Speed, in the Draft EIR/EIS, was incorporated into Section 3.11.6, Environmental Consequences.
- The discussion of temporary road closures and lane closures under Impact S&S#1 was revised to reflect a longer construction duration for the installation of four-quadrant gates and to reflect a phased construction approach to the realigned Tunnel Avenue overpass that would maintain access to Tunnel Avenue and Lagoon Road from Bayshore Boulevard throughout the construction process. A detailed description and new figures (Figures 3.11-11 through 3.11-16) of the phased construction approach were added to Impact S&S#1, Table 3.11-9 was updated, and the impact analysis of temporary road closures on emergency vehicle access/response in Brisbane was updated. Accordingly, the California Environmental Quality Act (CEQA) conclusion for Alternative A was revised to state that the impact of temporary road closures on emergency vehicle access would be less than significant under CEQA.
- Impact S&S#3 and Figure 3.11-18 were updated to reflect revisions to the design for the Relocated Brisbane Fire Station (Alternative A) based on feedback from the City of Brisbane and to clarify the access design for the Relocated Brisbane Fire Station (Alternative B). The figures illustrating the fire station configuration and access under both project alternatives (Figure 3.11-18 and Figure 3.11-19) were updated.
- Impact S&S#4 was updated to remove safety improvements at the Atherton Caltrain Station because it closed in 2020.
- The title of Impact S&S#9 was updated to more accurately reflect its applicability.

- Impact S&S#11 was revised to clarify that additional analysis of proposed structure locations, development of information associated with an FAA application, and registration for proposed project structures would be done as part of the final design phase of the selected alternative. It was also revised to incorporate additional information provided by the City of San Jose Airport Department and to correct an error in the number of communication radio towers requiring FAA notification for both project alternatives, correct the San Carlos Airport code and to update that in Redwood City, the radio tower would be co-located at Caltrain's Switching Station 1, Option 2.
- Impact S&S#13 was revised to reflect updated information on high-risk utility conflicts under each project alternative.
- Impact S&S#14 was modified to add additional description and analysis concerning at-grade crossing safety and information about Caltrain's planned signal system to meet FRA requirements for PTC and the approach to grade crossing preemption systems, and to remove safety improvements at the Atherton Caltrain Station that closed in 2020.
- Impact S&S#15 was revised to clarify that building codes and safety regulations also provide for the safe operation of the light maintenance facility (LMF).
- Section 3.11.7, Mitigation Measures, was updated as follows:
  - SS-MM#2: Modify Driveway Access Control for Relocated Brisbane Fire Station, was modified to clarify access to the Relocated Brisbane Fire Station under Alternative B.
  - SS-MM#3: Install Emergency Vehicle Priority Treatments near HSR Stations, was updated to acknowledge the City of San Jose's EVP and its applicability to the project.
  - SS-MM#4: Install Emergency Vehicle Priority Treatments Related to Increased Gate-Down Time Impacts, was revised to modify the monitoring requirements, to clarify the provision of additional emergency response equipment for existing fire stations, and to clarify consultation with local cities and fire departments. Additionally, a description was added of certain site-specific traffic mitigation measures that would apply if SS-MM#4 cannot reduce emergency vehicle response time impacts to a less-than-significant level.
- Section 3.11.8, Impact Summary for NEPA Comparison of Alternatives, was modified to reflect changes regarding impact conclusions for Impact S&S#3 related to emergency vehicle access/response associated with the Relocated Brisbane Fire Station (for both Alternatives A and B), to reflect updates to Impact S&S#11 regarding the number of structures requiring FAA notification under each project alternative, and to reflect updated information on high-risk utility conflicts under each project alternative.
- Section 3.11.9, CEQA Significance Conclusions, was modified to revise impact conclusions for Impact S&S#1 regarding construction-period emergency vehicle access and response times, to clarify Impact S&S#3 regarding Alternative B emergency vehicle access, and to include site-specific traffic mitigation measures as part of SS-MM#4.

3.11.1 Introduction

This section describes potential changes in safety and security in the project RSA as a result of construction and operations of the project. The analysis evaluates project construction and operations impacts on emergency services and community safety and security. It addresses the safety and security of construction site workers, high-speed rail (HSR) passengers and employees, and the public (including motorists, pedestrians, and bicyclists) who could be exposed to risks of loss, injury, or death during project construction and operations. The project would provide operational safety improvements by eliminating the need for pedestrians to cross active tracks at the existing Broadway (Alternatives A and B) and College Park (under Alternative A) Caltrain Stations and securing the right-of-way through the installation of perimeter fencing, four-quadrant gates, and median separators to reduce conflicts with automobiles and pedestrians at the at-grade crossings. The primary safety and security concerns associated with the project

would be temporary interference with emergency vehicle access during construction of the passing tracks under Alternative B, an increase in emergency vehicle response times due to increased gate-down times at the at-grade crossings, and the potential for operations-related rail accidents/incidents.

Primary Safety and Security Benefits and Impacts

- Safety improvements at the existing Broadway (Alternatives A and B) and College Park (under Alternative A) Caltrain Stations would eliminate the need for pedestrians to cross the active rail tracks.
- Installation of at-grade crossings, perimeter fencing, and four-quadrant gates would improve safety along the right-of-way.
- Construction of a passing track under Alternative B would temporarily increase emergency vehicle response times due to modifications of nine underpasses.
- Project operations would increase emergency vehicle response times for fire stations and first responders in San Francisco, Millbrae, Burlingame, Redwood City, Menlo Park, Palo Alto, Mountain View, and San Jose due to HSR station traffic and/or increase in gate-down times at the at-grade crossings.
- The project could increase the potential for operations-related rail accidents and incidents.

HSR service in the Project Section would share tracks with Caltrain along approximately 43 to 49 miles of blended system infrastructure, depending on the alternative, primarily within the existing Caltrain right-of-way. To achieve safe operation of the blended system and maintain community safety and security, which is the highest priority (California High-Speed Rail Authority [Authority] 2012a; Authority and FRA 2005, 2008), the blended system has been designed for optimal performance in conformance with industry standards and federal and state safety regulations. Performance standards for the blended system are included in Table 2-1 of Chapter 2, Alternatives. The blended system would be a partially grade-separated, limited-access guideway with operating speeds of up to 110 miles per hour (mph). At-grade roadway crossings would be controlled by four-quadrant gates and roadway channelization. Unauthorized access of the corridor would be deterred by perimeter fencing of the right-of-way.

Overall safety and reliability of the HSR system would be achieved by the application of proven technical standards to meet the desired level of performance. The HSR system design integrates an overall set of guiding principles and system requirements consistent with European and Asian HSR systems and U.S. rail requirements to establish safe and secure HSR system design and operation.

The following appendices in Volume 2, Technical Appendices, of this Final EIR/EIS provide additional details on safety and security:

- Appendix 2-A, Roadway Crossings, Modifications, and Closures, describes road crossings of the alignment, road relocations, and road closures resulting from project construction.
- Appendix 2-B, Railroad Crossings, describes existing and proposed railroad crossings of the project alternatives.
- Appendix 2-D, Applicable Design Standards, describes the relevant design standards for the project alternatives.
- Appendix 2-E, Project Impact Avoidance and Minimization Features, provides the list of all impact avoidance and minimization features (IAMF) incorporated into this project.
- Appendix 2-I, Regional and Local Plans and Policies, provides a list by resource of all applicable regional and local plans and policies.
- Appendix 2-J, Policy Consistency Analysis, provides a summary by resource of project inconsistencies and reconciliations with local plans and policies.
- Appendix 3.1-B, San Francisco Bay Conservation and Development Commission Bay Plan Consistency Analysis, provides a summary of the project's consistency with San Francisco Bay Plan (Bay Plan) policies (BCDC 2019).

- Appendix 3.2-A, Transportation Data on Intersections, provides data used in the analysis of potential impacts on intersections.
- Appendix 3.2-C, Traffic Mitigation Measures Screening, provides the screening evaluation of potential site-specific traffic mitigation measures considered to address National Environmental Policy Act (NEPA) adverse effects related to traffic delay against Authority criteria for identifying traffic mitigation measures.
- Appendix 3.6-A, Public Utilities and Energy Facilities, identifies existing utilities and energy facilities in the public utilities RSA and provides a determination of whether relocation or protection in place would be required.
- Appendix 3.11-A, Safety and Security Data, provides data used in the analysis to evaluate impacts on safety and security related to the project alternatives.
- Appendix 3.11-B, Airport Obstructions, provides an assessment of potential encroachment of the project alternatives on aviation airspace pursuant to FAA FAR Part 77 regulations.

Safety and security concerns associated with other hazardous conditions are described and evaluated elsewhere in this Final EIR/EIS. The following nine resource sections and chapter provide additional information related to construction and operations safety and security:

- Section 3.2, Transportation, evaluates impacts of the project alternatives on transportation, circulation, and access, including road closures and roadway, pedestrian, and bicycle access.
- Section 3.3, Air Quality and Greenhouse Gases, evaluates impacts of the project alternatives from air emissions, such as air toxics and fugitive dust emissions.
- Section 3.5, Electromagnetic Fields and Electromagnetic Interference, evaluates impacts of the project alternatives on human health from electromagnetic fields and electromagnetic interference, including nuisance shocks.
- Section 3.6, Public Utilities and Energy, evaluates impacts of the project alternatives on utilities, energy, and water infrastructure (including from relocations), drainage canals, stormwater systems, water districts, public utility groundwater use, and water supply, as well as impacts on natural gas and petroleum fuel pipelines (identified as high-risk facilities in the context of safety and security).
- Section 3.8, Hydrology and Water Resources, evaluates impacts of the project alternatives on safety related to flood risk.
- Section 3.9, Geology, Soils, Seismicity, and Paleontological Resources, evaluates impacts of the project alternatives on safety related to seismic and geotechnical hazards.
- Section 3.10, Hazardous Materials and Wastes, evaluates impacts of the project alternatives on safety related to hazardous materials and waste, such as use of hazardous materials or exposure to soil and groundwater contamination.
- Section 3.18, Cumulative Impacts, evaluates impacts of the project alternatives and other past, present, and reasonably foreseeable future projects.
- Chapter 5, Environmental Justice, evaluates impacts of the project alternatives that could have disproportionate adverse effects on low-income populations and minority populations.

3.11.1.1 Definition of Resources

The following definitions for resources and facilities are related to safety and security analyzed in this Final EIR/EIS:

- **Emergency services**—Emergency services include emergency response by fire protection, law enforcement, and emergency medical services to fire, seismic events, or other emergency situations.

- **Fire protection services**—Fire protection services provide predominantly emergency firefighting and rescue services. These services typically include local fire departments, including paid and volunteer fire departments, county fire services, and equipment used to respond to incidents.
- **Law enforcement**—Law enforcement services address the discovery, deterrence, rehabilitation, or punishment of criminal behavior and make sure that the laws of an area are obeyed. These services are provided by federal, state, and local law enforcement agencies. Railroad operators, including the Authority, may also employ railroad police officers to enforce state laws for the protection of railroad property, personnel, passengers, and cargo (49 C.F.R. Part 207).
- **Emergency medical services**—Emergency medical services refer to the treatment and transport of people in crisis health situations that may be life threatening. These services are typically provided by local fire departments, emergency medical service agencies, and independent ambulance services.
- **Emergency response plans**—Emergency response plans are created by counties and cities in the RSA and outline procedures for operations during emergencies such as earthquakes, floods, fires, and other natural disasters; hazardous materials spills; transportation emergencies; civil disturbance; and terrorism.
- **Community safety and security**—Community safety and security addresses safety and security concerns of construction site workers, HSR passengers and employees, and members of the general public (including motorists, pedestrians, and bicyclists) that could be exposed to significant risks of loss, injury, or death during project construction, and HSR system passengers and employees or structures that could be exposed to significant risk of loss, injury, or death during project operations:
  - Community safety addresses emergency and fire response; automobile, pedestrian and bicycle safety; landfill safety; fire hazards; rail and airport safety; school safety; and high-risk facilities and fall hazards.
  - Community security addresses high-risk facility security, criminal acts (including vandalism, theft, and violence), and acts of terrorism.

3.11.2 Laws, Regulations, and Orders

This section presents federal, state, regional, and local laws, regulations, and orders applicable to safety and security and relevant to the project. The Authority would implement the HSR project in compliance with all federal and state regulations. Volume 2, Appendix 2-I describes regional and local plans and policies relevant to safety and security considered in the preparation of this analysis.

3.11.2.1 Federal

Federal Railroad Administration, Procedures for Considering Environmental Impacts (64 Federal Register 28545)

These FRA procedures state that an EIS should consider possible impacts on public safety.

Rail Safety Improvement Act of 2008 (Public Law 110-432)

The Rail Safety Improvement Act reauthorized the FRA to oversee the nation's rail safety program. One aim of the statute is to improve conditions of rail bridges and tunnels. The Rail Safety Improvement Act also requires that railroads implement PTC systems by the end of 2015 on certain rail lines.[2] PTC infrastructure consists of integrated command, control,

[2] In late 2015, Congress extended the deadline by at least 3 years to December 31, 2018, and required FRA to approve any railroad's request for an "alternative schedule and sequence" with a final deadline not later than December 31, 2020, if a railroad demonstrated it had met certain statutory criteria by December 31, 2018 (www.fra.dot.gov/ptc).

communications, and information systems for controlling train movements that improve railroad safety by significantly reducing the probability of collisions between trains, casualties to roadway workers and damage to their equipment, and over-speed accidents (49 C.F.R. Parts 200–299).[3]

United States Code on Railroad Safety (49 United States Code § 20101 et seq.)

This code contains a series of statutory provisions governing the safety of railroad operations.

Federal Railroad Administration, System Safety Program (49 C.F.R. Part 270)

This regulatory program requires commuter and intercity passenger railroads to develop and implement an SSP to improve the safety of their operations. An SSP is a structured program with proactive processes and procedures, developed and implemented by railroads to identify and mitigate or eliminate hazards to reduce the number and rates of railroad accidents, incidents, injuries, and fatalities.

On August 12, 2016, the FRA published the final rule requiring commuter and intercity passenger railroads to develop and implement an SSP to improve safety of their operations. The FRA published a revised final rule on March 4, 2020 (85 *Federal Register* [Fed. Reg.] 12826), which took effect May 4, 2020.

Federal Railroad Administration, Passenger Equipment Safety Standards; Standards for Alternative Compliance and High-Speed Trainsets (49 C.F.R. Parts 229, 231, 236, and 239)

The final rule amends FRA's passenger equipment safety standards using a performance-based approach to adopt new and modified requirements governing the construction of conventional- and high-speed passenger rail equipment. This final rule adds a new tier of passenger equipment safety standards (Tier III) to facilitate the safe implementation of nationwide, interoperable high-speed passenger rail service at speeds up to 220 mph. While Tier III trainsets must operate in an exclusive right-of-way without grade crossings at speeds above 125 mph, these trainsets can share the right-of-way with freight trains and other tiers of passenger equipment at speeds not exceeding 125 mph. The final rule also establishes alternative crashworthiness and occupant protection performance requirements for Tier I passenger trainsets. The Tier III requirements and Tier I alternative crashworthiness and occupant protection requirements remove regulatory barriers and enable use of new technological designs, allowing a more open U.S. rail market. Additionally, the final rule increases the maximum speed for passenger equipment from 150 mph to 160 mph, which complies with FRA's Tier II requirements.

In accordance with federal regulations (49 C.F.R. Part 239), Caltrain prepares and periodically updates an emergency preparedness plan, *Caltrain Passenger Train Emergency Preparedness Plan*, most recently in February 2013 at the time of this analysis. The plan covers the following topics related to emergencies: communications, employee training and qualifications, joint operations, special circumstances, liaison with emergency responders, onboard emergency equipment, passenger safety information, handling passengers with disabilities, passenger train emergency simulations, debriefing and critiques, emergency exits, and operation (efficiency) tests (Peninsula Corridor Joint Powers Board [PCJPB] 2015).

Department of Homeland Security/Transportation Security Administration, Rail Transportation Security (49 C.F.R. Part 1580)

The Rail Transportation Security regulation codifies the Transportation Security Administration (TSA) inspection program. It also includes security requirements for freight railroad carriers;

[3] The California HSR System is required to employ an automatic train control (ATC) system. The ATC system would provide functions of automatic train protection, automatic train operation, and automatic train supervision. The ATC system would include all the safety and non-safety critical functions of a train control system and would comply with FRA's positive train control requirements under both the federal Rail Safety Improvement Act of 2008 and 49 C.F.R. Part 236, Subpart I. A full description of the intended ATC system is provided in the Authority's *Technical Memorandum 3.3.1, Automatic Train Control: Concept of System* (Authority 2010a), and *Technical Memorandum 3.3.2, Automatic Train Control Site Requirements* (Authority 2010b).

intercity, commuter, and short-haul passenger train service providers; rail transit systems; and rail operations at certain fixed-site facilities that ship or receive specified hazardous materials by rail.

Transportation Security Administration, Security Directives for Passenger Rail

Security Directives RAILPAX-04-01 and RAILPAX-04-02 require rail transportation operators to implement certain protective measures, report potential threats and security concerns to the TSA, and designate a primary and alternate security coordinator.

Emergency Planning and Community Right-to-Know Act (42 C.F.R. Part 116)

The objectives of the Emergency Planning and Community Right-to-Know Act are to allow state and local planning for chemical emergencies, provide for notification of emergency releases of chemicals, and address a community's right to know about toxic and hazardous chemicals.

Federal Aviation Regulations (14 C.F.R. Part 77)

Under FAR Part 77 regulations for determining obstructions to airspace, an existing object, including a mobile object, would be an obstruction to air navigation if it penetrates the surface of a takeoff and landing area of an airport or any imaginary surface[7] established for the airport (14 C.F.R. § 77.24). This regulation establishes that notification must be submitted to the FAA a minimum of 45 days prior to proposed commencement of construction.

3.11.2.2 State

California Government Code Section 65302

California Government Code (Gov. Code) Section 65302 requires cities and counties to include in their general plan a statement of development policies setting forth objectives, principles, standards, and plan proposals for seven policy areas, including safety. The purpose of the safety element is to provide for the protection of the community from any unreasonable risks associated with seismic and geologic hazards, flooding, and wildland and urban fires. The element must also address evacuation routes, peak load water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

California Public Utilities Code Section 765.5

Under California Public Utilities Code Section 765.5, the CPUC is required to establish minimum inspection standards so that railroad locomotives, equipment, and facilities located in Class I railroad yards are inspected at least every 120 days; and all branch and mainline tracks are inspected at least every 12 months. The CPUC is required to conduct focused inspections of railroad yards and track, either in coordination with FRA or as the CPUC finds necessary. The focused inspection program targets rail yards and tracks that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density.

California Public Utilities Code Section 768

Under California Public Utilities Code Section 768, the CPUC may, after a hearing, require every public utility to construct, maintain, and operate its line, plant, system, equipment, apparatus, tracks, and premises in a manner that promotes and safeguards the health and safety of its employees, passengers, customers, and the public. The CPUC may prescribe, among other things, the installation, use, maintenance, and operation of appropriate safety or other devices or appliances, including interlocking and other protective devices at grade crossings or junctions and block or other systems of signaling. The CPUC may establish uniform or other standards of construction and equipment, and require the performance of any other act which the health or safety of its employees, passengers, customers, or the public may demand.

[7] The term *imaginary surfaces* is defined in Volume 2, Appendix 3.11-B.

California Public Utilities Code Sections 7661 and 7665 (Local Community Rail Security Act of 2006)

Under California Public Utilities Code Section 7661 and Section 7665 (the Local Community Rail Security Act of 2006), every railroad corporation operating in California is required to develop, in consultation with and with the approval of the California Emergency Management Agency,[8] a protocol for rapid communications with the agency, the California Highway Patrol (CHP), and designated county public safety agencies in an endangered area if there is a runaway train or any other uncontrolled train movement that threatens public health and safety. Railroad corporations are required to promptly notify the California Emergency Management Agency, the CHP, and designated county public safety agencies, through a communication to the Warning Center of the California Emergency Management Agency, if there is a runaway train or any other uncontrolled train movement that threatens public health and safety, in accordance with the railroad corporation's communications protocol.

California Public Utilities Code Sections 309, 315, 765, 768, 7710, 7727, 7661, and 7665 et seq.

Under these codes, the CPUC is required to adopt safety regulations and to report sites on railroad lines that are deemed hazardous. The Rail Accident Prevention and Response Fund was created in an effort to support prevention regulations financially through fees paid by surface transporters of hazardous materials. In addition, the Railroad Accident Prevention and Immediate Deployment Force was created to provide immediate on-site response in the event of a large-scale unauthorized release of hazardous materials. Modifications of existing highway–rail crossings require CPUC authorization, and temporarily impaired clearance during construction requires application to the CPUC and notice to railroads.

California Public Resources Code (Title 14 and Title 19)

The California Department of Forestry and Fire Protection (CAL FIRE) implements fire safety regulations in the state. The California Public Resources Code (Title 14 and Title 19) includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment with an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify the fire suppression equipment that must be provided on-site for various types of work in fire-prone areas.

CAL FIRE has rated areas within California for their potential fire hazards. The risk of wildland fires is influenced by a combination of factors, including winds, temperatures, humidity levels, and fuel moisture content. Of these four factors, wind is the most crucial. Steep slopes also contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Where there is easy human access to dry vegetation, fire hazards increase because of the greater chance of human carelessness.

To quantify this potential risk, CAL FIRE has developed a fire hazard severity scale to predict the damage a fire is likely to cause (CAL FIRE 2012a). CAL FIRE's fire hazard model incorporates wildland fuels, topography, weather, fire frequency and severity, and the production of burning firebrands (embers), including how receptive land sites are to starting new fires and how far embers move (CAL FIRE 2012a). Under CAL FIRE's fire hazard model, fire hazard severity zones are rated moderate, high, and very high (CAL FIRE 2012a).

CAL FIRE has the primary financial responsibility of preventing and suppressing fires in certain portions of the state, or *state responsibility areas*. These areas include lands covered wholly or in part by timber, brush, undergrowth, or grass, whether of commercial value or not; lands that protect the soil from erosion and retard run off or percolation; lands used principally for range or forage purposes; lands not owned by the federal government; and lands that are not incorporated (CAL FIRE 2015). Lands are removed from state responsibility areas when housing densities

[8] The California Emergency Management Agency was superseded by the California Governor's Office of Emergency Services in 2013.

average more than three units per acre over an area of 250 acres, unless dictated otherwise. More than 31 million acres of California's privately owned wildlands are within state responsibility areas (CAL FIRE 2015). Areas that are not within a state responsibility area are considered to be within a *local responsibility area*.

CPUC General Order 164-D, Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems and Federal Transit Administration Rail Fixed Guideway Systems: State Safety Oversight (49 C.F.R. Part 659)

CPUC General Order 164-D and 49 C.F.R. Part 659 require CPUC, as a designated state safety oversight agency, to review each rail transit agency's system safety and security program at a minimum of once every 3 years. The purpose of these triennial reviews is to verify compliance and evaluate the effectiveness of each rail transit agency's system safety program plan and security and emergency preparedness plan (SEPP) to assess the level of compliance with CPUC General Order 164-D and other CPUC safety and security requirements (CPUC 2015).

CPUC General Order No. 75-D, Regulations Governing Standards for Warning Devices for At-Grade Highway-Rail Crossings in the State of California

The CPUC regulates at-grade crossing safety. Among other requirements, the CPUC requires the following per General Order No. 75-D in addition to signage, flashing lights, audible warnings and two-quadrant gates:

- A vehicle detection system must be installed whenever exit gates are used. The system must be designed such that if a vehicle is detected between the entrance and exit gates, the exit gate will remain upright until the vehicle clears the exit gate.
- At an at-grade crossing with automatic warning devices where a diagnostic team determines that preemption is necessary, for example where vehicular traffic queues from traffic signal–controlled intersections exceed the Clear Storage Distance (as defined in the California Manual on Uniform Traffic Control Devices), the traffic signals must be interconnected with the automatic warning devices.

California Emergency Services Act (Gov. Code § 8550 et seq.)

The California Emergency Services Act supports the state's responsibility to mitigate adverse effects of natural, human-produced, or war-caused emergencies that threaten human life, property, and environmental resources of the state. The act aims to protect human health and safety and to preserve the lives and property of the people of the state. The act provides the California Office of Emergency Services (Cal OES) with the authority to prescribe powers and duties supportive of the act's goals. In addition, the act authorizes the establishment of local organizations to carry out its provisions.

California Public Resources Code Section 21096

The California Public Resources Code (Cal. Public Res. Code) requires use of the California Department of Transportation (Caltrans) Division of Aeronautics *Airport Land Use Planning Handbook* (Caltrans 2011) as a technical resource to assist in the preparation of an EIR for any project situated within the boundaries of an airport land use compatibility plan, which extends to adjacent lands surrounding the airport. The handbook supports the State Aeronautics Act (Cal. Public Res. Code § 21670 et seq.) and provides compatibility planning guidance to airport land use commissions, their staffs and consultants, the counties and cities having jurisdiction over airport area land uses, and airport proprietors.

California Public Resources Code Section 21098

Cal. Public Res. Code Section 21098 specifies notification procedures if a proposed project is: (1) located within a "low-level flight path" for aircraft that fly lower than 1,500 feet above the ground, or (2) a "military impact zone" within 2 miles of a military installation under the jurisdiction of the U.S. Department of Defense.

California Public Utilities Code Section 21674.7

California Public Utilities Code Section 21674.7 establishes procedures for airport land use planning, including development of airport comprehensive land use plans (CLUP) and defining airport influence areas (AIA). The AIA is a composite of the areas surrounding the airport that are affected by noise, height, and safety considerations. The AIA is defined as a feature-based boundary around the airport within which all actions, regulations, and permits must be evaluated by local agencies to determine how the airport CLUP policies may affect the proposed development. This evaluation is to determine if the development meets the conditions specified for height restrictions, and noise and safety protection to the public.

Gas Monitoring and Control at Active and Closed Disposal Sites (27 Cal. Code Regs. § 20917 et seq.)

California Code of Regulations (Cal. Code Regs.), Title 27, Section 20917 et seq. sets forth the performance standards and the minimum substantive requirements for landfill gas monitoring and control as it relates to active solid waste disposal sites. The regulations also define proper closure, post-closure maintenance, and ultimate reuse of solid waste disposal sites. These standards and requirements are intended to protect public health and safety and the environment from pollution due to the disposal of solid waste.

California Department of Forestry and Fire Protection—Strategic Fire Plan for California

The *Strategic Fire Plan for California* (CAL FIRE 2016) provides the state's road map for reducing the risk of wildfire. Part of this plan identifies and assesses community assets at risk of wildfire damage. CAL FIRE generates a list of California communities at risk for wildfire and creates fire hazard severity zones.

Power Line Safety and Fire Prevention (14 Cal. Code Regs. § 1250)

Cal. Code Regs., Title 14, Section 1250, "Fire Prevention Standards for Electric Utilities," specifies utility-related measures for fire prevention. It also provides specific exemptions from electric pole and tower firebreak clearance standards, as well as electric conductor clearance standards, and specifies when and where the standards apply.

California Occupational Safety and Health Administration Construction Safety Orders (8 Cal. Code Regs. § 1502 et seq.)

Worksite safety in California, including construction worksite safety, is regulated by provisions of Title 8 of the Cal. Code Regs. and overseen by the California Occupational Safety and Health Administration (Cal-OSHA). Title 8 requires compliance with standard procedures to prevent construction worksite accidents and requires a written workplace injury and illness prevention program to be in place.

McAteer-Petris Act (Gov. Code § 66600 et seq.)

The McAteer-Petris Act vests BCDC with the authority to plan and regulate activities and development in and around the San Francisco Bay, consistent with policies adopted in the Bay Plan. BCDC regulates the filling and dredging of the San Francisco Bay and any substantial change in use of any water or land within the area of BCDC's jurisdiction through the permitting process described in the act. The act affords BCDC jurisdiction over five areas in and around the San Francisco Bay: (1) "Bay" jurisdiction, (2) "shoreline" jurisdiction, (3) "saltponds" jurisdiction, (4) "managed wetlands" jurisdiction, and (5) "certain waterways" jurisdiction. Only two of these BCDC jurisdictional areas are relevant for the project: the Bay and shoreline jurisdictions.

The project includes areas within BCDC jurisdiction at Mission Creek and Islais Creek in San Francisco; Visitacion Creek, Guadalupe Valley Creek, and Brisbane Lagoon in Brisbane; Oyster Point and Colma Creek in South San Francisco; and El Zanjon Creek in San Bruno.

The agency's decision to grant or deny a permit for the project is guided by the act's provisions and the standards set out in the Bay Plan. BCDC is authorized to regulate fill or dredge the San Francisco Bay and development of the "shoreline band," which consists of the area within 100

feet of the shoreline. The McAteer-Petris Act creates broad circumstances under which a permit is required by providing that any person wishing to place fill, extract materials, or make any substantial change in the use of water, land, or structures within areas subject to BCDC's jurisdiction obtain a permit. The term *fill* is defined broadly to include not only earth and other materials, but pilings, structures placed on pilings, and floating structures. BCDC is authorized to issue a permit for fill in the Bay if it determines that the issuance of the permit would be consistent with the provisions of the Act and with the policies established for the Bay Plan or if BCDC determines that the activity to be permitted is necessary for the health, safety or welfare of the public in the entire Bay Area. Pursuant to Section 66605 of the McAteer-Petris Act, BCDC must determine if the proposed fill in the Bay: (1) is for a water-oriented use and provides public benefits that outweigh the adverse impacts from the loss of open water areas; (2) there is no alternative upland location available for the proposed action; (3) the fill would be the minimum amount necessary to achieve the purpose of the proposed action; (4) the nature, location, and extent of fill minimizes harmful effects on the Bay; and (5) the fill is constructed in accordance with sound safety standards. Volume 2, Appendix 3.1-B sets out the Bay Plan policies pertinent to the project, including policies related to the safety of fills, and an assessment regarding the consistency of the project with those policies.

The McAteer-Petris Act also provides that a permit must be obtained from BCDC prior to undertaking construction activities within the shoreline band jurisdiction. In addition, for permitting purposes, the Act allows for areas associated with the shoreline band to be designated by BCDC for priority uses. Within such areas, the proposed use must be consistent with the uses specified for the designated area. To obtain a permit for development within the shoreline band, the proposed project must provide for maximum feasible public access to the Bay and the shoreline.

California High-Speed Rail Program Safety and Security Management Plan

Safety and security are priority considerations in the planning and execution of all work activities for construction of the California HSR System. The system safety and system security programs for the development and operation of HSR are described in the *California High-Speed Rail Program Safety and Security Management Plan* (SSMP) (Authority 2016). Based upon Federal Transit Administration guidelines for the safe and secure development of major capital projects, the SSMP includes the Authority's Safety and Security Policy Statement, roles and responsibilities for safety and security across the system, the program for managing safety hazards and security threats/vulnerabilities, safety and security certification program requirements, and construction safety and security requirements. A hierarchy of controls to be applied when considering the management of identified hazards is as follows:

1. Avoidance
2. Elimination
3. Substitution
4. Engineering controls
5. Warnings
6. Administrative controls
7. Personal protection equipment

The safety and security of HSR passengers, employees, and the surrounding communities would be assured through the application of risk-based system safety and system security programs that identify, assess, avoid, and mitigate hazards and vulnerabilities for the HSR. Using domestic and international regulations, guidance, and industry best practices, the objective of the HSR system safety and security programs is to adequately and consistently apply risk-based hazard mitigation measures.

The blended system would be a partially grade-separated, limited-access guideway. Four-quadrant gates and roadway channelization at the at-grade roadway crossings and perimeter fencing along the right-of-way would prevent intrusion into the right-of-way. HSR trainsets would employ the latest safety features and designs to enable the trains to stay upright and in-line in the event of a derailment. PTC would provide additional protections against train collisions. The stations and LMF would include fire and life safety infrastructure (including fire and smoke

prevention and control), security and communications systems, and features to manage adjacent hazards from electrical and other utilities and hazardous materials facilities. Access controls for adjacent facilities, based upon existing regulations, guidance, or site-specific analysis, would maintain the safety and security of both HSR operations and adjacent communities.

The SSMP for the project was developed during project design and is updated annually. The SSMP applies to design, construction, testing, and startup of the HSR system but does not apply to revenue operations of the project. The SSMP would lead to the development of the SSP and the SEPP that would be applicable to project operations and that would govern safety and security for the HSR operating system (Authority 2016). The Authority would require the SSP and the SEPP to be developed and implemented prior to commencement of HSR revenue service in accordance with the FRA regulation (49 C.F.R. Part 270) requiring the application of a SSP to passenger railroad operations.

As part of the SSP for the HSR system, the Authority would continue the risk-based hazard management program and risk-based hazard analysis to identify new hazards and resulting risks on the HSR operating system. The results of the hazard analysis would be used to develop and implement methods for mitigating or eliminating the identified hazards and risks to the extent practicable. The SSP would describe the procedures, processes, and programs the Authority has implemented that would support the safety and security goals of the SSP. These procedures, processes, and programs would include a maintenance, inspection, and repair program; a rules compliance and procedures review program; an employee and contractor training program; and a public safety outreach program.

3.11.2.3 Regional and Local

Volume 2, Appendix 2-I lists all regional and local policies that are applicable to the project. In addition to these regional and local policies, regional and local safety requirements may incorporate National Fire Protection Association (NFPA) Codes and Standards. The NFPA develops, publishes, and disseminates more than 300 codes and standards intended to minimize the possibility and effects of fire and other risks. *Technical Memorandum: Safety and Security Design Requirements for Infrastructure Elements* (TM 2.8.1) (Authority 2013a) incorporates several NFPA codes and standards. For example, TM 2.8.1 relies on NFPA 130, as updated in 2017, *Standard for Fixed Guideway and Passenger Rail Systems* (NFPA 2017), to specify guidance on incorporating passenger safety into the system design; egress routes in the event of an emergency; emergency response planning, training, and operations; and fire and smoke prevention and suppression. Additionally, NFPA 1710, Standard for the Organization and Deployment *of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (NFPA 2016), includes measures to protect citizens and the occupational safety and health of fire department employees.

3.11.3 Consistency with Plans and Laws

As indicated in Section 3.1.5.3, Consistency with Plans and Laws, CEQA and Council on Environmental Quality (CEQ) regulations require a discussion of inconsistencies or conflicts between a proposed undertaking and federal, state, regional, or local plans and laws. Accordingly, this Final EIR/EIS describes the inconsistency of the project alternatives with federal, state, regional, and local plans and laws to provide planning context.

Several federal and state laws and implementing regulations, listed in Section 3.11.2.1 and Section 3.11.2.2 are relevant to safety and security. These federal and state requirements include:

- Federal and state laws and regulations that provide comprehensive directives for safety and security on passenger rail. Applicable laws and regulations include the Federal Rail Safety Improvement Act, California State Public Utilities Code on Railroad Safety, FRA regulations for railroad transportation safety, TSA Security Directives for Passenger Rail, and the California General Plan Law.

- Federal and state laws and regulations that provide comprehensive requirements for safety, security, and emergency response planning include the Federal Emergency Planning and Community Right-to-Know Act, the California Public Utilities Code, the California Emergency Services Act, the Cal. Public Res. Code, and the California General Plan Law.

The Authority, as the lead agency proposing to build and operate the HSR system, is required to comply with all federal and state laws and regulations and to secure all applicable federal and state permits prior to initiating construction on the selected alternative. Therefore, there would be no inconsistencies between the project alternatives and these federal and state laws and regulations.

The Authority is a state agency and therefore is not required to comply with local land use and zoning regulations and municipal codes; however, it has endeavored to design and build the HSR project so that it is consistent with them. For example, the project alternatives incorporate IAMFs that require construction contractors to coordinate with local jurisdictions before and during construction to maintain emergency vehicle access. The Authority reviewed a total of 48 regional and local plans and ordinances with 233 relevant goals, objectives, and policies (Volume 2, Appendix 2-I) and has determined that the project alternatives were inconsistent with only six policies or ordinances from the following local policies and plans:

- **City of San Mateo General Plan, Circulation Element** (City of San Mateo 2015)—Policies C 3.5 and C 5.6. Although the project would improve the safety of existing at-grade crossings, it would not change the existing grade levels of railroad/roadway crossings. The project design would not preclude future grade separation of existing at-grade crossings.
- **San Mateo Downtown Area Plan** (City of San Mateo 2009)—Policy VI.3. Although the project would improve the safety of existing at-grade crossings, it would not change the existing grade levels of railroad/roadway crossings. The project design would not preclude future grade separation of existing at-grade crossings.
- **San Mateo Rail Corridor Transit-Oriented Development Plan** (City of San Mateo 2005)—Policy 4.4. Although the project would improve the safety of existing at-grade crossings, it would not result in changes to the existing grade levels of railroad/roadway crossings. The project design would not preclude future grade separation of existing at-grade crossings.
- **Belmont Municipal Code**—Section 15.5, Speed of Trains. Operations of HSR trains within the segment of track between Ralston Avenue and Harbor Boulevard would exceed the 35-mph speed limit in the Belmont Municipal Code. However, this code section was put in place in 1961 prior to the Ralston Avenue and Harbor Boulevard grade separations, which removed the at-grade crossing. Since these crossings are now grade separated, this policy is out of date.
- **City of Palo Alto Comprehensive Plan 2030** (City of Palo Alto 2017)—Policy T.3-13. Although the project would improve the safety of existing at-grade crossings, it would not change the existing grade levels of railroad/roadway crossings. The project design would not preclude future grade separation of existing at-grade crossings.

The project alternatives are consistent with the airport CLUPs for San Francisco International Airport (SFO), Norman Y. Mineta San Jose International Airport (SJC), San Carlos Airport (SQL), Moffett Field (KNUQ), and Palo Alto Airport (KPAO).

3.11.4 Methods for Evaluating Impacts

The evaluation of impacts on safety and security is a requirement of NEPA and CEQA. The following sections define the RSAs and summarize the methods used to analyze impacts on safety and security. As summarized in Section 3.11.1, Introduction, nine other resource sections and chapters in this Final EIR/EIS also provide additional information related to safety and security.

3.11.4.1 Definition of Resource Study Area

As defined in Section 3.1, Introduction, RSAs are the geographic boundaries in which the environmental investigations specific to each resource topic were conducted. The RSA for

impacts on safety and security encompasses the areas directly and indirectly affected by project construction and operations. These areas include the project footprint for each alternative plus an additional distance from the project footprint where construction and operations could affect emergency services and community safety and security.

The safety and security RSA also includes communities, cities, and counties along the Project Section, which could be indirectly affected by project construction and operations. Indirect impacts from construction and operations could influence an area outside of the RSA for direct impacts because certain service providers (e.g., fire departments, police departments, hospitals) are located outside of, but have service boundaries or provide service within, the safety and security RSA for direct impacts. These service providers are in the cities of San Francisco, Brisbane, South San Francisco, San Bruno, Millbrae, Burlingame, San Mateo, Belmont, San Carlos, Redwood City, Atherton, Menlo Park, Palo Alto, Mountain View, Sunnyvale, and Santa Clara. Table 3.11-1 identifies the safety and security RSAs.

Table 3.11-1 Definition of Safety and Security Resource Study Areas

Type	General Definition
Construction and Operations—Direct Impacts	
Rights-of-way, stations, and LMF	Areas within the right-of-way and within 0.5 mile of the project footprint including the rights-of-way, stations, and maintenance facilities
Schools[1]	Areas within 0.25 mile of the project footprint
Landfills[2]	Areas within 0.25 mile of the project footprint
Airports and high-risk facilities[3]	Areas within 2 miles of the project footprint
Oil and gas wells[4]	Areas within 200 feet of the project footprint
Emergency service providers	Areas within 0.5 mile of the project footprint, including the right-of-way, stations, and LMF
Construction and Operations—Indirect Impacts	
Emergency service providers	Emergency service providers' service areas

Cal. Code Regs. = California Code of Regulations
LMF = light maintenance facility
[1] Cal. Code Regs., Title 5, Section 14010(d), requires a safety study for new school sites within 1,500 feet (approximately 0.25 mile) of an existing railroad.
[2] Landfills would be identified within 0.25 mile of the project footprint per Cal. Code Regs., Title 27, Section 20925.
[3] High-risk facilities include landfills, oil and gas wells, cement plants, ethanol plants, gas plants, industrial plants, power plants, refineries, wastewater treatment facilities, and dams.
[4] Oil and gas wells would be identified within 200 feet of the project footprint per Cal. Code Regs., Title 14, Section 1720.

Landfills are included under both the landfill RSA and the high-risk facilities RSA. Landfills would be identified within 0.25 mile of the project footprint per California regulations under the landfill RSA and within 2 miles of the project footprint under the high-risk facilities RSA.

Oil and gas wells are included under both the oil and gas well RSA and the high-risk facilities RSA. Oil and gas wells would be identified within 200 feet of the project footprint per California regulations under the oil and gas well RSA and within 2 miles of the project footprint under the high-risk facilities RSA.

3.11.4.2 Impact Avoidance and Minimization Features

IAMFs are project features that are considered to be part of the project and are included as applicable in each of the alternatives for purposes of the environmental impact analysis. The full text of the IAMFs that are applicable to the project is provided in Volume 2, Appendix 2-E. The following IAMFs are applicable to the safety and security analysis:

- SS-IAMF#1: Construction Safety Transportation Management Plan
- SS-IAMF#2: Safety and Security Management Plan
- SS-IAMF#3: Hazards Analyses
- AQ-IAMF#1: Fugitive Dust Emissions
- TR-IAMF#1: Protection of Public Roadways during Construction
- TR-IAMF#2: Construction Transportation Plan
- TR-IAMF#3: Off-Street Parking for Construction-Related Vehicles
- TR-IAMF#5: Maintenance of Bicycle Access
- TR-IAMF#6: Restriction on Construction Hours
- TR-IAMF#7: Construction Truck Routes

This environmental impact analysis considers these IAMFs as part of the project design. In Section 3.11.6, each impact narrative describes how these project features are applicable and, where appropriate, effective at avoiding or minimizing potential impacts to less than significant under CEQA.

3.11.4.3 Method for Impact Analysis

This section describes the sources and methods the Authority used to analyze potential project impacts on safety and security. These methods apply to both NEPA and CEQA analyses, unless otherwise indicated. Refer to Section 3.1.5.4, Methods for Evaluating Impacts, for a description of the general framework for evaluating impacts under NEPA and CEQA. Sections 3.11.4.4, Method for Evaluating Impacts under NEPA, and 3.11.4.5, Method for Determining Significance under CEQA, describe the NEPA and CEQA impact methodologies used to evaluate project impacts on safety and security.

The Authority collected data from and reviewed several sources to inform the analysis of potential project impacts on emergency services, community safety, and security. The following sections discuss topic-specific evaluation methods to assess project impacts on emergency services, community safety, security, and wildfire hazards.

Emergency Services

To assess project impacts on emergency services, the Authority reviewed the following information and data sources:

- Authority requirements for safety and security plans and procedures applicable to the project (i.e., the SEPP, SSMP, and SSP), and the technical memoranda that describe implementation of these plans and procedures and the specific safety and security requirements for HSR system infrastructure (e.g., TM 2.8.1, *Safety and Security Design Requirements for Infrastructure Elements*, identifies the safety and security requirements for infrastructure elements for the HSR system [Authority 2013a]).
- Technical memoranda that describe the Authority's plans and procedural requirements to evaluate their applicability to and their effect on potential safety and security impacts of construction and operations of the HSR project. Safety and security plans and procedures that reduce the safety and security impacts of the project are incorporated into IAMFs that are applicable to construction and operations of the project.
- General plans, emergency plans, and other relevant local municipality planning documents, as well as information from consultations with local fire protection, police, and other emergency service providers.
- Vehicle accident data and train accident/incident data from the CHP and FRA.
- The locations of police stations and law enforcement call response times within the emergency services RSA.
- Crime rates in San Francisco, San Mateo, and Santa Clara Counties and crime rates throughout the state were identified to evaluate conditions for law enforcement and response times in the RSA in comparison to statewide averages.

- Statistics for onboard crime on passenger trains obtained from the Los Angeles County Metropolitan Transportation Authority (Metro) and San Francisco Bay Area Rapid Transit (BART) were reviewed to identify the types of potential operational security impacts that could result from project operations.
- The locations of fire stations, the types of equipment operated, and emergency response times within the emergency services RSA.
- Temporary and permanent road closures and relocations, grade-separated crossings, and at-grade crossings, as well as the linear extent of the project that would operate on elevated track.

The Authority evaluated construction impacts on emergency vehicle response by reviewing the potential emergency vehicle response disruptions and rerouting associated with building the project alternatives. The Authority evaluated the potential impacts on emergency vehicle response based on potential changes in the roadway network, routing, and construction hours.

The Authority reviewed the engineering plans and project footprints, passenger trip generation estimates, and intersection level of service (LOS) results to determine emergency vehicle response impacts due to increased station traffic from project operations. The Authority also conducted a geospatial screening analysis to assess how project operations would affect emergency vehicle response times. This included identifying fire station locations and potential locations where fire station/first responder response times could be affected by increased gate-down time at the at-grade crossings because of increased train service along the Project Section. The Authority further identified locations where increases in response times could occur and assessed the impact based on a 30-second threshold increase.

Community Safety

The Authority based the evaluation of community safety and security impacts primarily on two factors: (1) existing conditions compared to the design and operations features of the project alternatives, and (2) international rail operating experience. The analysis addresses safety issues related to construction site hazards and criminal activity, traffic hazards, interference with airports, exposure to Valley fever, rail-related hazards (e.g., train accidents and incidents),[10] exposure to landfills and high-risk facilities, fall hazards, and interference with community facilities including police stations, fire stations, and hospitals. Additionally, this analysis evaluates HSR passenger and employee safety risks from the potential for security concerns, such as criminal acts or acts of terrorism, which would result in automated train shutdowns or emergency evacuations.

The Authority reviewed the planned roadway improvements and project-related temporary or permanent road closures and realignments that would be implemented during construction and operations, and the potential impact on motor vehicle drivers, pedestrians, and bicyclists. Data was gathered from the CHP (CHP 2008, 2016) and the FRA (FRA 2018a, 2018b, 2018c, 2018d, 2018e, 2018f) to evaluate automobile, pedestrian, and bicycle safety, including incidents occurring at highway-rail grade crossings and to characterize train accidents and incidents within the safety and security RSA.

In addition, the Authority developed a geographic information system (GIS) database with electronic information from local and regional government sources to determine local land uses (including consistency with airport land use compatibility plans), potential fire hazards, landfills, high-risk facilities, and nearby oil and natural gas wells to evaluate how construction and operation of the project alternatives may cause safety hazards. Data sources included the

[10] As defined in 49 C.F.R. Section 225.5, a *train accident* involves damages to equipment ("… any collision, derailment, fire, explosion, act of God, or other event involving operation of railroad on-track equipment, whether standing or moving, that results in damages greater than the current reporting threshold to railroad on-track equipment, signals, track, track structures, and roadbed"). A *train incident* involves injuries ("… any event involving the movement of on-track equipment that results in a reportable casualty, but does not cause reportable damage above the current threshold established for train accidents"). In general, train incidents involve injuries or fatalities (casualties) and train accidents involve property damage. As defined by the FRA, a *casualty* is a reportable death, injury, or illness arising from the operation of a railroad. Casualties may be classified as either fatal or nonfatal (FRA 2011).

California Division of Oil, Gas, and Geothermal Resources oil and natural gas well database (California Division of Oil, Gas, and Geothermal Resources 2019), the *San Francisco to San Jose Project Section High-Risk and Major Utilities Conflict Memorandum—Record PEPD* (Authority 2019a), U.S. Environmental Protection Agency (USEPA) registry of wastewater treatment plants (WWTP) (USEPA 2017), the WESTCARB Carbon Atlas GIS data (University of California, Berkeley 2017), U.S. Army Corps of Engineers (USACE) database of dams (USACE 2018), and the California Solid Waste Information System database (California Department of Resources Recycling and Recovery 2018).

Security

The evaluation of the potential project alternative impacts on security involved similar methods as those used to evaluate emergency services and safety impacts. The Authority assessed local security conditions by reviewing police departments and law enforcement call response times within the emergency services RSA. The Authority used statistics for onboard crime on passenger trains obtained from Metro and BART to identify the types of potential security impacts near the HSR stations and LMF that might result from implementation of the project alternatives (Federal Bureau of Investigation [FBI] 2015a, 2015b, 2015c, 2015d). Additionally, the Authority reviewed monthly safety and security reports published by Caltrain, which summarize the frequency of various types of incidents involving law enforcement (Caltrain 2015). These data represent the best publicly available statistics for the types of crimes that might occur during project operations.

The analysis also evaluated the potential for criminal acts or acts of terrorism affecting the HSR system and other high-risk facilities in the RSA that would result in automatic train shutdowns or emergency evacuations.

To assess project impacts, the Authority reviewed the following information:

- The locations of police departments, as well as law enforcement call response times.
- The locations of high-risk facilities, such as cement plants, WWTPs, electric power plants, landfills, and dams and reservoirs.
- The locations of oil and gas wells.
- The potential effects of criminal acts or terrorism.
- Crime rates in San Francisco, San Mateo, and Santa Clara Counties and crime rates throughout the state.
- Statistics for onboard crime on passenger trains for Metro and BART.
- Statistics on frequency and type of incidents involving law enforcement for Caltrain.
- The locations and service areas of fire departments, types of equipment operated, and emergency response times for fire departments within the RSA.
- Responsibilities of railroad police officers under 49 C.F.R. Part 207.

Refer to Volume 2, Appendix 3.11-A for more information about the data sources used in this analysis. The Authority also considered the federal, state, and regional and local laws, regulations and orders (Section 3.11.2, Laws, Regulations, and Orders) that regulate safety and security while evaluating project impacts on safety and security.

Wildfire Hazards

The Authority based the evaluation of wildland fire risks primarily on two factors: (1) existing fire severity zoning within the RSA and (2) the design, construction and operational fire safety measures, features and programs that would be implemented.

The Authority developed a GIS database with electronic information from local and regional government sources to determine potential fire hazards and evaluate how construction and

operation of the project alternatives may cause safety hazards. Data sources included CAL FIRE's fire severity zone maps (CAL FIRE 2007a, 2007b, 2007c, 2008a, 2008b). Additionally, this analysis evaluated HSR passenger and employee safety risks from onboard fire, which would result in automated train shutdowns or emergency evacuations.

3.11.4.4 Method for Evaluating Impacts under NEPA

CEQ NEPA regulations (40 C.F.R. Parts 1500–1508) provide the basis for evaluating project effects (as described in Section 3.1.5.4). As described in Section 1508.27 of these regulations, the criteria of context and intensity are considered together when determining the severity of the change introduced by the project.

- **Context**—For this analysis, the *context* would include conditions related to safety and security within the RSA, including existing emergency services, law enforcement, emergency medical services, emergency response plans, and community safety features; the regulatory setting relevant to safety and security, including regional and local safety and security plans and procedures, and the Authority's SSMP; and the history of safe and secure operations of international HSR systems.
- **Intensity**—For this analysis, *intensity* is determined by assessing the degree to which the project could affect the public health and safety of HSR passengers, employees, and the surrounding communities through a reduction in emergency response access, an increase in emergency response times, construction worker risks (e.g., exposure to safety hazards or hazardous materials at construction sites), accident risks, or an increase of vulnerability to criminal or terrorist activity.

3.11.4.5 Method for Determining Significance under CEQA

The Authority uses the following thresholds to determine if a significant impact on safety and security would result from the project alternatives. For the CEQA analysis, the project would result in a significant impact on safety and security if it would:

- Conflict with adopted policies, plans, or programs regarding safety of public transit, bicycle, or pedestrian facilities, or otherwise decrease the safety of such facilities (please refer to Section 3.11.3, Consistency with Plans and Laws, and Volume 2, Appendix 2-J for a consistency analysis of adopted policies, plans, or programs related to safety and security of transportation modes)
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses
- Result in a safety hazard for people residing or working in the project vicinity (for a project in an area where there is an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport or within the vicinity of a private airstrip)
- Result in a safety hazard for people in the RSA from construction or operations activities
- Result in substantial adverse physical impacts associated with the provision of and the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services, including fire protection, police protection, and emergency services
- Result in inadequate emergency access[11]

[11] For the purposes of this analysis, *inadequate emergency access* is defined as either a substantial blockage of physical access for emergency response purposes or a substantial increase in emergency vehicle response times (defined as greater than 30 seconds). While there are local standards for emergency vehicle response time, there are no established state or federal emergency vehicle response time standards, and the Authority was not able to identify specific thresholds previously used under CEQA to evaluate this impact. The 30-second criterion was selected on the basis of several

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan
- If located in or near state responsibility areas or lands classified as very high fire hazard severity zones:
  - Substantially impair an adopted emergency response plan or emergency evacuation plan
  - Because of slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire
  - Require the installation or maintenance of associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment
  - Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes

3.11.5 Affected Environment

This section describes the affected environment for emergency services, community safety, and security in the RSA. This information provides the context for the environmental analysis and the evaluation of impacts.

3.11.5.1 Emergency Services and Response

Emergency Service Response Plans

Volume 2, Appendix 2-I summarizes and discusses emergency operations requirements, including all applicable emergency response plans for the affected communities in the emergency services RSA. In addition to emergency operations requirements set forth in the county and city general plans, all counties and cities operate under the guidance of emergency operations plans. These plans outline procedures for fire, law enforcement, and emergency medical service operations during emergencies such as earthquakes, floods, fires, and other natural disasters; hazardous materials spills; transportation emergencies; and terrorism. The plans also identify the location of emergency response facilities, such as emergency dispatch and operations centers, government structures, and hospitals or other medical facilities. Figure 3.11-1 through Figure 3.11-5 identify these facilities, while Volume 2, Appendix 3.11-A provides additional information on these facilities.

considerations. (1) The Authority reviewed local emergency management agency standards for response times, of which the more conservative were around 5 minutes. An emergency response time of 30 seconds—or 10 percent of 5 minutes (300 seconds)—was considered to represent a substantial delay. (2) Section 3.2 identifies NEPA effects for signalized intersections with congested conditions (defined as LOS E or F), where the project would result in 4 seconds of additional delay. Because an emergency vehicle route across the railroad would likely encounter anywhere from two to six intersections affected by gate-down time, a 30-second delay would include the collective effects of up to seven intersections.

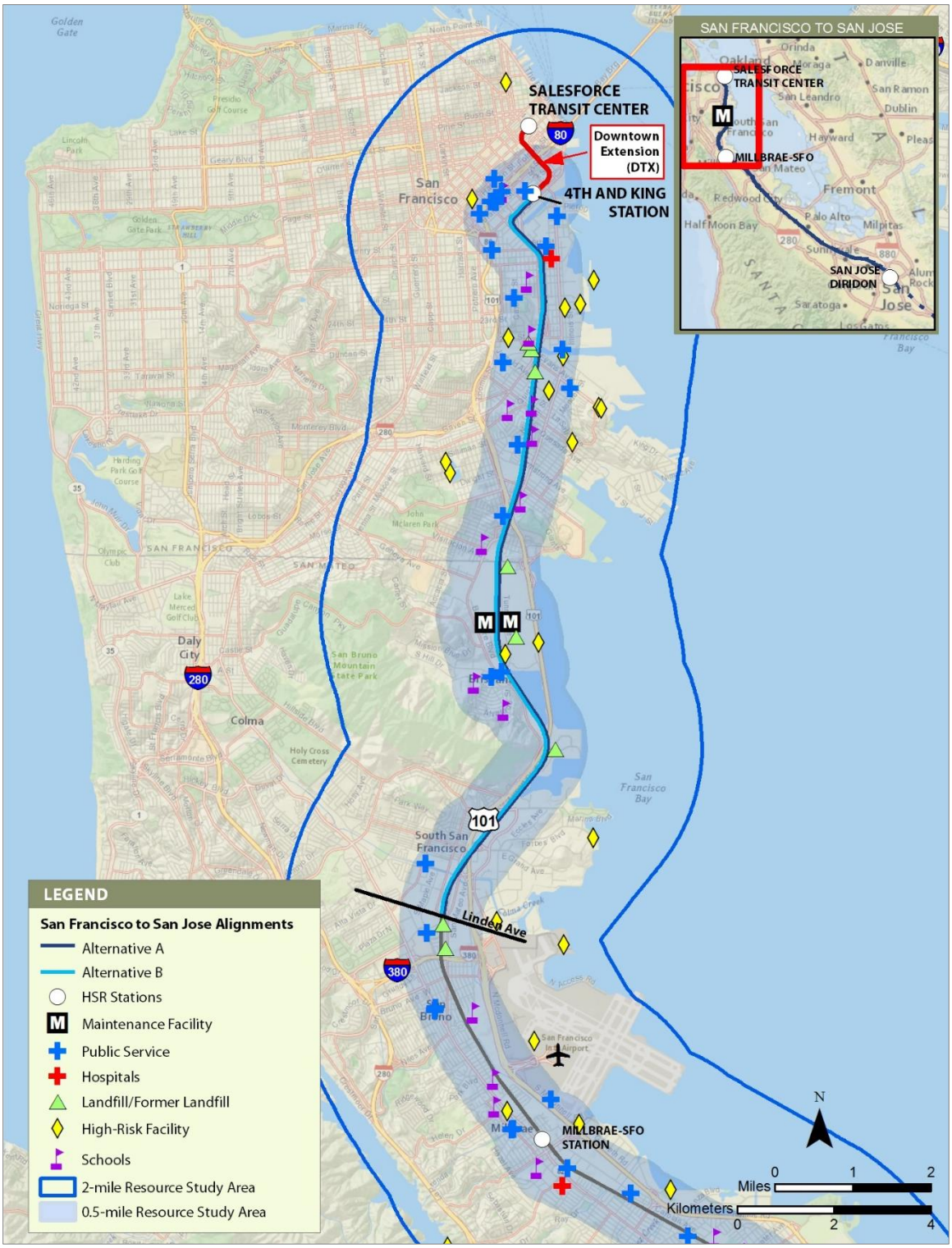

Figure 3.11-1 Safety and Security Facilities in the Resource Study Area—San Francisco to South San Francisco Subsection

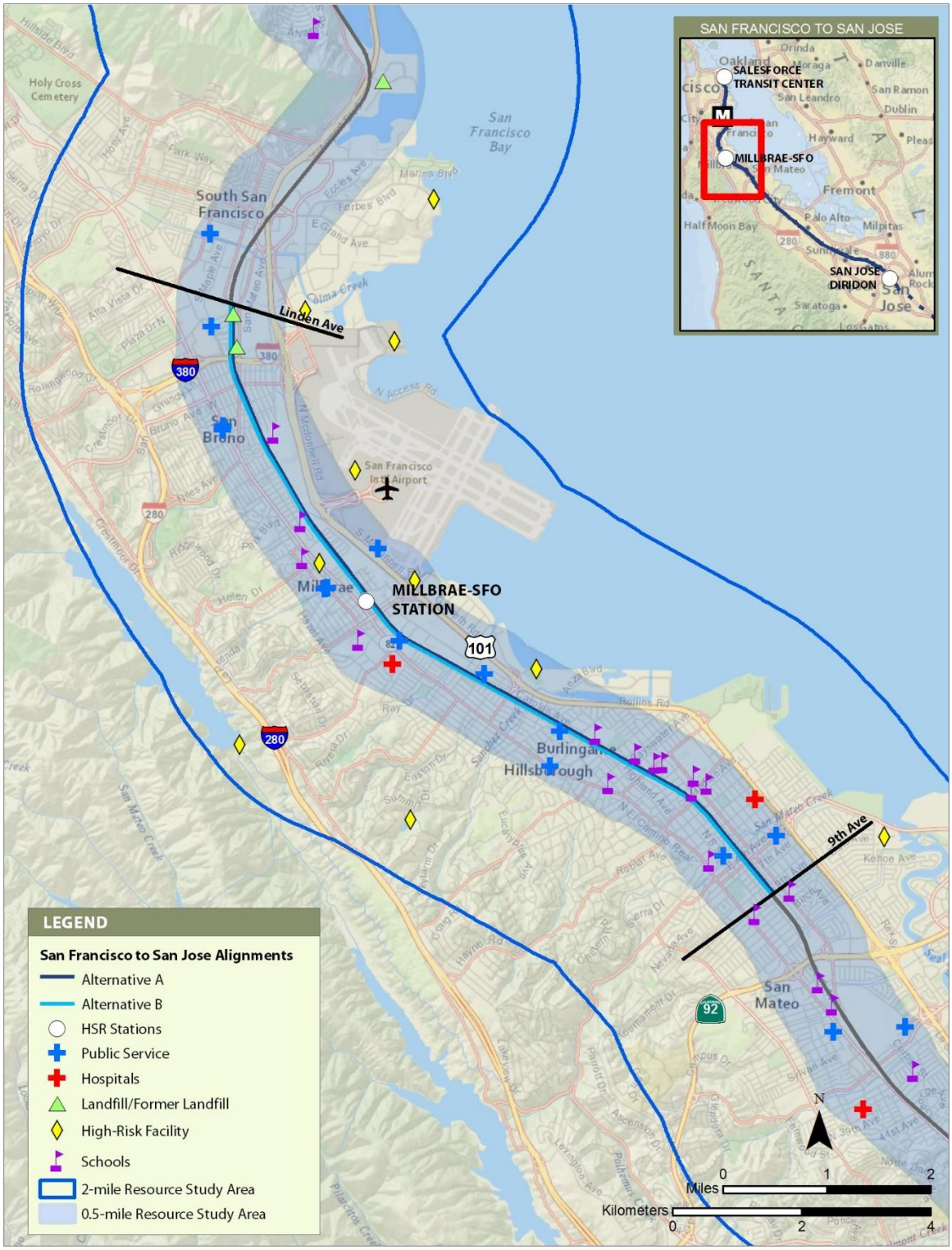

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Figure 3.11-2 Safety and Security Facilities in the Resource Study Area—San Bruno to San Mateo Subsection

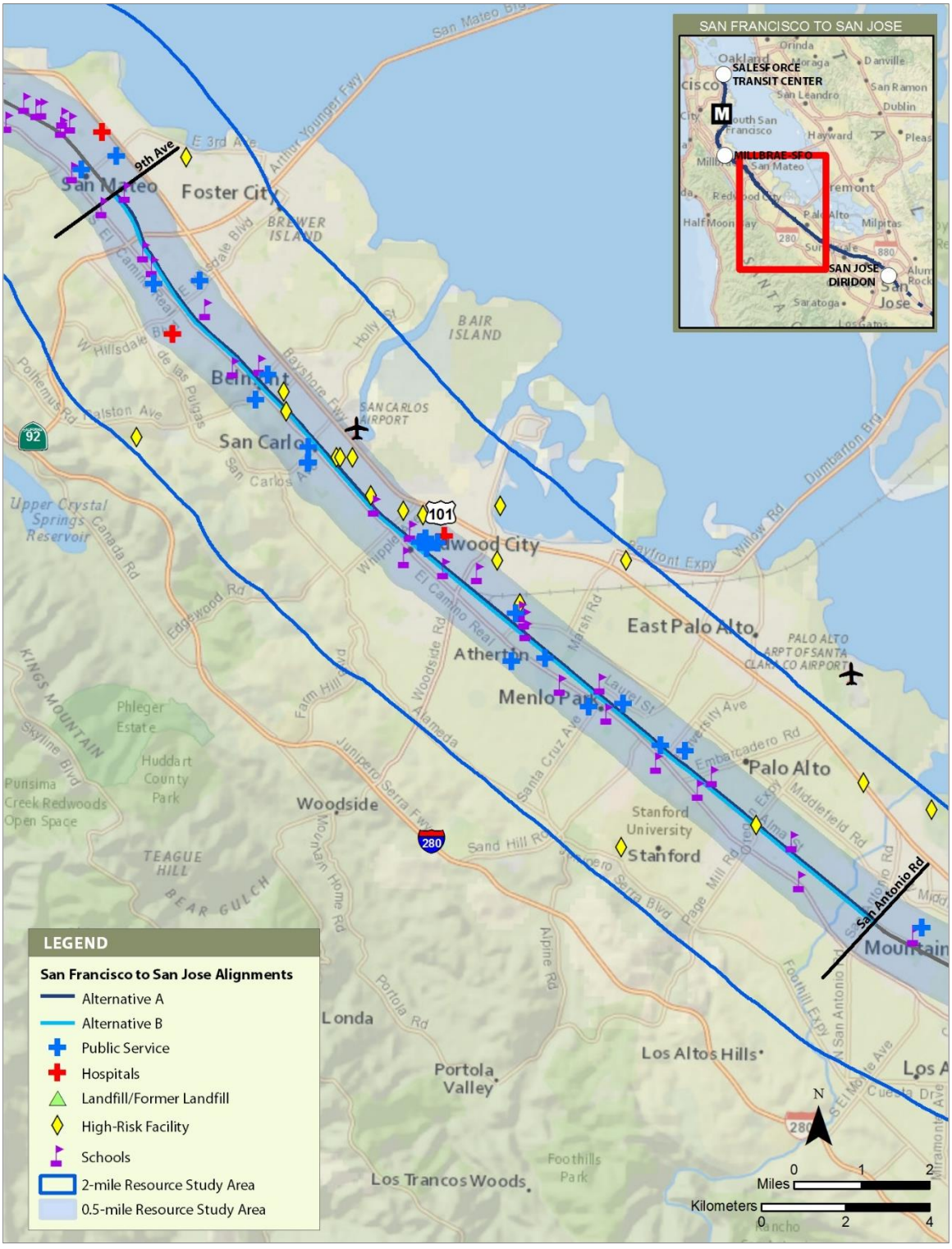

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Figure 3.11-3 Safety and Security Facilities in the Resource Study Area—San Mateo to Palo Alto Subsection

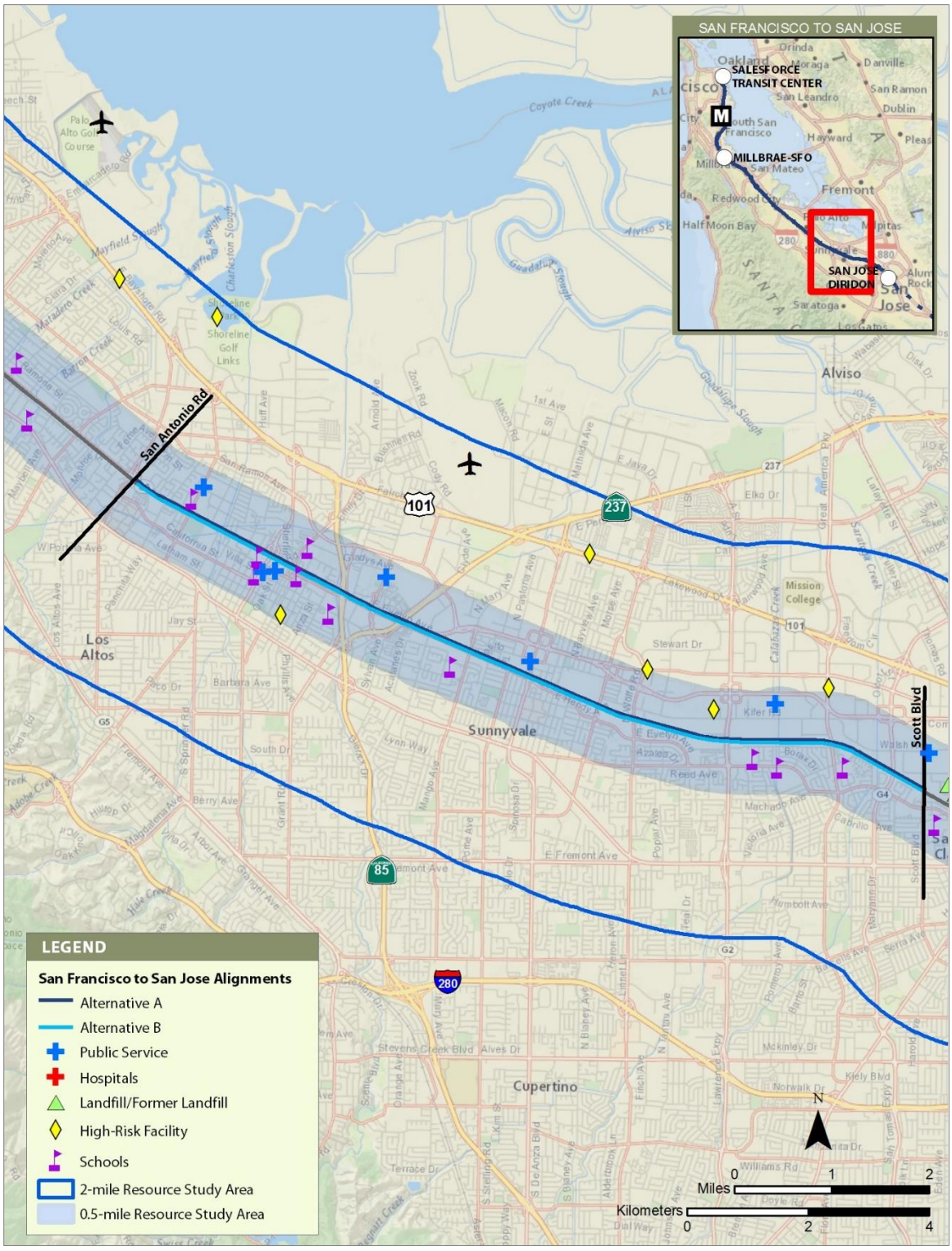

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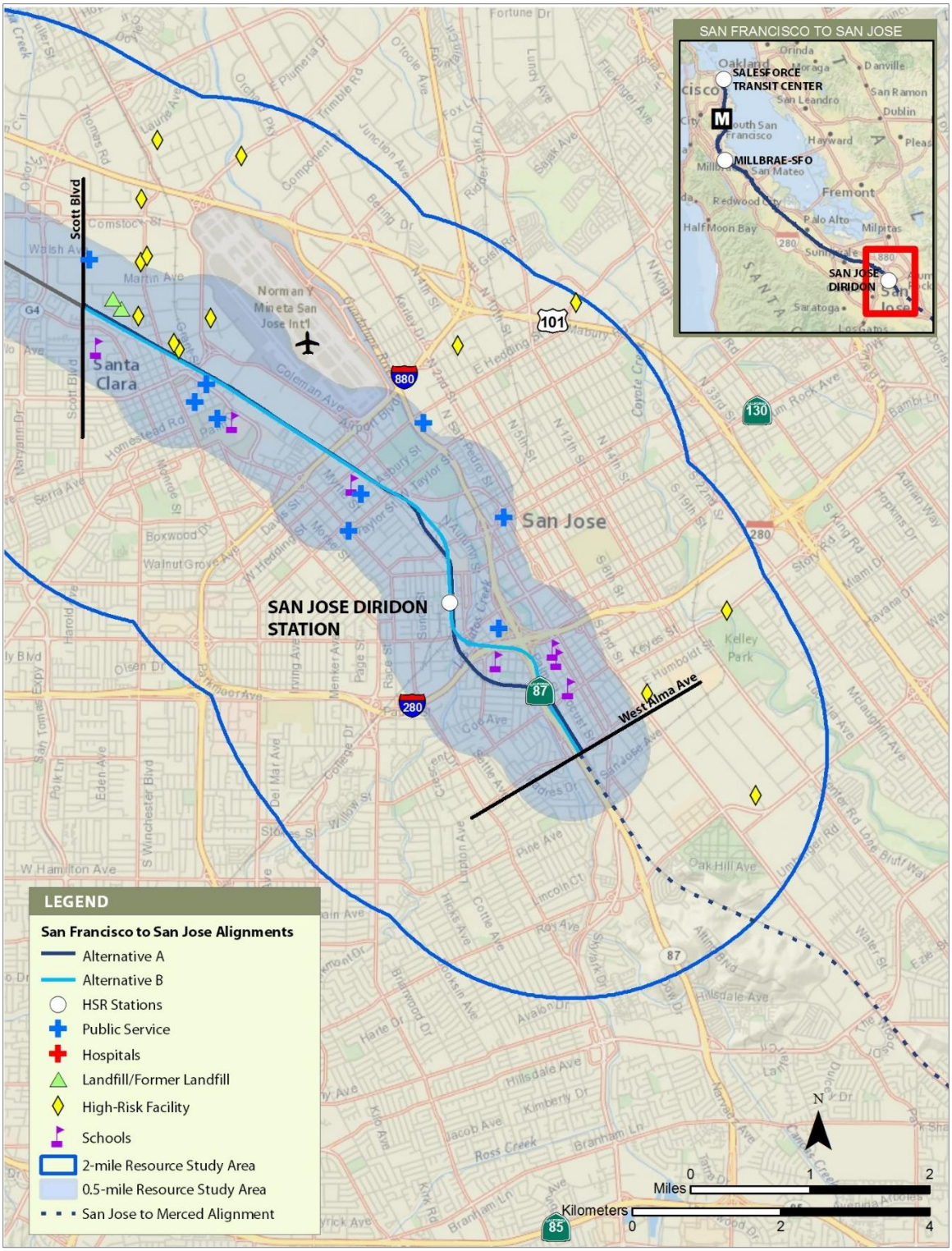
Figure 3.11-4 Safety and Security Facilities in the Resource Study Area—Mountain View to Santa Clara Subsection



MARCH 2020

Figure 3.11-5 Safety and Security Facilities in the Resource Study Area—San Jose Diridon Station Approach Subsection

Existing passenger rail services in the Project Section include Caltrain and BART. Caltrain provides passenger rail service on the San Francisco Peninsula between San Francisco and San Jose, with stops in San Mateo County and Santa Clara County. In accordance with federal regulations (49 C.F.R. Part 239), Caltrain prepares and periodically updates an emergency preparedness plan, *Caltrain Passenger Train Emergency Preparedness Plan*. At the time of the analysis, the most recent plan was published in in February 2013. The plan covers the following topics related to emergencies: communications, employee training and qualifications, joint operations, special circumstances, liaison with emergency responders, onboard emergency equipment, passenger safety information, handling passengers with disabilities, passenger train emergency simulations, debriefing and critiques, emergency exits, and operation (efficiency) tests (PCJPB 2015). BART provides passenger rail transit service between downtown San Francisco and cities in the northern portion of the San Francisco Peninsula (including Millbrae), Oakland, Berkeley, Fremont, Walnut Creek, Dublin/Pleasanton, and other cities in the East Bay. Similar to Caltrain, BART also prepares emergency preparedness plans in accordance with federal regulations that cover the same topics as those articulated for Caltrain.

Cal OES has developed guidelines for a standardized emergency management system (Cal OES 2009). This system is required by California Gov. Code Section 8607(a) for managing emergencies involving multiple jurisdictions and agencies, including standard procedures for emergency response personnel to request resources and equipment from other agencies (Cal OES 2009, 2014). San Francisco County, San Mateo County, and Santa Clara County apply the National Incident Management System and the 2014 Cal OES Standardized Emergency Management System, and Incident Command System protocols in responding to emergency incidents. The Standardized Emergency Management System incorporates the Incident Command System, a field-level emergency response system, multi-agency/interagency coordination of emergency response activities, a mutual aid system for obtaining emergency resources from unaffected jurisdictions, and an operational area concept for coordination of resource requests and emergency response of California counties and their subdivisions (City and County of San Francisco 2017; County of San Mateo 2015; County of Santa Clara 2017).

Regionally significant roads, discussed in Section 3.2, are typically identified as emergency evacuation routes in county and city general plans and emergency response plans. Regionally significant roads include Interstate (I-) 80, I-280, U.S. Highway (US) 101, State Routes (SR) 1 and 35, and numerous arterial streets in San Francisco; US 101, I-280, I-380, SR 35, SR 84, SR 92, El Camino Real (SR 82), and numerous arterial streets in San Mateo County; and US 101, I-280, SR 84, SR 85, SR 237, expressways, and arterial streets in Santa Clara County. Where regionally significant roads in the emergency services RSA cross the railway, they are typically grade separated.

Between the 4th and King Street Station in San Francisco and Scott Boulevard in Santa Clara, there are 94 roadway crossings of the railway—39 of which are at-grade roadway crossings and 55 of which are grade separated. There are also 15 grade-separated pedestrian crossings and 15 at-grade pedestrian crossings of the railway. In the San Jose Diridon Station Approach Subsection, there are 17 roadway crossings of the railway—2 of which are at-grade roadway crossings and 15 of which are grade-separated.

Emergency Medical Services

Emergency medical services are provided by the local fire departments, emergency medical services agencies, and independent ambulance services. Fifteen hospitals provide emergency medical services within the RSA. Locations of hospitals in the RSA are illustrated on Figure 3.11-1 through Figure 3.11-5 and also are listed in Volume 2, Appendix 3.11-A.

Emergency Service Response

Past development has led to conditions affecting emergency service access and response times. Regional and local plans outline procedures for existing and future community conditions, including fire, law enforcement, and emergency medical service operations during emergencies such as fires and other natural disasters, hazardous materials spills, transportation emergencies, civil disturbance, and terrorism. Average law enforcement and fire department response times are shown in Table 3.11-2 and Table 3.11-3. Response times are not always consistent with applicable goals and objectives outlined in the regional and local planning documents.

Table 3.11-2 Service Areas and Response Times for Police and Sheriff Departments in the Resource Study Area

Police Department	Service Area	Average Response Time (minutes:seconds)[1]	Response Time Goals
City and County of San Francisco			
San Francisco Police Department	City and County of San Francisco	For FY 2017–2018: Priority A: 5:28 Priority B: 5:48 Priority C: 11:20	The San Francisco Police Department's goal is 4 minutes for responses to calls for serious incidents (Priority A).
San Mateo County			
Brisbane Police Department	City of Brisbane	Emergencies: 4:11 Non-emergencies: 5:18	The *City of Brisbane General Plan* establishes an average 3-minute emergency response and 10-minute non-emergency response goal.
South San Francisco Police Department	City of South San Francisco	High-priority calls within 2:00 to 3:00	No specific response criteria or metrics identified
San Bruno Police Department	City of San Bruno	Priority 1: 5:05 Priority 2: 11:14	Not available
Burlingame Police Department	City of Burlingame	Priority 1: 4:37 Priority 2: 8:35	General, no specific response criteria or metrics identified (e.g., respond as quickly and safely as possible)

Police Department	Service Area	Average Response Time (minutes:seconds)[1]	Response Time Goals
San Mateo County Sheriff's Office	Incorporated and unincorporated areas including: City of Half Moon Bay, City of Millbrae, City of San Carlos, Eichler Highlands, Town of Portola Valley, Town of Woodside, North Fair Oaks, Belmont/Harbor Industrial Area, Redwood City, Menlo Oaks, West Menlo, Stanford Lands, Ladera Oaks, Los Trancos Woods, South San Francisco, San Bruno Mountain, Burlingame Hills, Colma/Broadmoor Area, North Coast, Mid-Coast, South Coast, and Skyline/La Honda Area	For FY 2018–2019: Priority 1: 5:03	The San Mateo County Sheriff's Office has established an under-8-minute response time target.
City of San Mateo Police Department	City of San Mateo	For FY 2017–2018: Priority 1: 5:14 Priority 2: 6:13 Priority 3: 9:34 Priority 4: 20:23	The City of San Mateo Police Department does not have a response time criterion for each priority. The expectation is to dispatch them immediately to the highest priority that takes precedence.
Belmont Police Department	City of Belmont	Priority 1: 4:00	The Belmont Police Department does not have any response time standards for Priority 1 calls.
Redwood City Police Department	City of Redwood City	Priority 1: 2:42 Priority 2: under 3:00	Not available
Atherton Police Department	Town of Atherton	Priority 1: 5:12 Priority 2: 10:28 Priority 3: 66:46	Under 8 minutes for Priority 1 calls
Menlo Park Police Department	City of Menlo Park	Priority 1: 5:00 Priority 2: 7:00 to 8:00 Priority 3: 10:00 to 12:00	No specific response criteria or metrics identified

Police Department	Service Area	Average Response Time (minutes:seconds)[1]	Response Time Goals
Santa Clara County			
Santa Clara County Sheriff's Office	Unincorporated areas of Santa Clara County	Not available	Not available
Palo Alto Police Department	City of Palo Alto	Priority 1: Under 6:00 Priority 2: Under 10:00	Within industry standard
Mountain View Police Department	City of Mountain View	In 2017, the response time to emergency and Priority 1 calls was 4:00 or less 54.4% of the time.	Priority 1 and other emergency calls in less than 4 minutes
Sunnyvale Department of Public Safety	City of Sunnyvale	For FY 2018–2019: Type 1 emergency: 5:00	There are no internal response time criteria for the Sunnyvale Department of Public Safety.
Santa Clara Police Department	City of Santa Clara	For FY 2017-2018: Priority 1: 4:26	The Santa Clara Police Department does not have a standard for Priority 1 calls.
San Jose Police Department	City of San Jose	Priority 1: 6.7 minutes Priority 2: 20.3 minutes	The San Jose Police Department target response time for police services is 6 minutes for Priority 1 calls and 11 minutes for Priority 2 calls. Acceptable response times are considered to be 6 minutes or less for 60% of all Priority 1 calls and 11 minutes or less for 60% of all Priority 2 calls.

Sources: Town of Atherton 2017; City of Belmont 2017; City of Brisbane 2018; Cremer 2018; Diaz 2016; Matteucci 2018; City of Menlo Park 2016; City and County of San Francisco 2018a; San Francisco Sheriff's Department 2018; San Mateo County Sheriff's Office 2018; Spaith 2018; Stewart 2016; City of San Jose 2013; City of San Jose Police Department 2016; Silva 2018; Knauer 2019; McDowell 2019; City of Santa Clara 2018
FY = fiscal year
[1] When calls for services are received, dispatchers assign priorities (e.g., Priority 1, Priority 2) based on the severity of the incident. Within the RSA, Priority 1 or A calls correspond to the most serious life-threatening emergencies that require immediate response, followed by incidents that typically require less immediate responses including the possibility of bodily harm or property damage, which are listed in descending order of priority as Priority 2 or B, Priority 3 or C, etc.

Table 3.11-3 Response Times for Municipal and County Fire Departments and Emergency Medical Services

Fire Department	Service Area	Response Time (minutes:seconds)	Response Criteria (minutes:seconds)
San Francisco County	**Local Responsibility Areas**		
San Francisco Fire Department	City and County of San Francisco and SFO Airport	First Responder BLS: 5:00 90% of the time First Responder ALS: 5:52 90% of the time Ambulance Code 2: 17:17 90% of the time Ambulance Code 3: 8:56 90% of the time	First Responder BLS: The SFFD shall ensure that appropriate responders are on the scene of all life-threatening emergencies (Code 3) within 4:30 90% of the time. First Responder ALS: Providers shall ensure that appropriate responders are on the scene of Code 3 emergencies within 7:00 90% the time. Ambulance Code 2: Providers shall ensure that an ambulance is on scene of non-life-threatening emergencies (Code 2) within 20:00 90% of the time. Ambulance Code 3: Providers shall ensure that a Patient-Transport Capable Vehicle (Ambulance) is on scene of Code 3 emergencies within 10:00 90% the time.
San Mateo County	**State Responsibility Areas**		
San Mateo County Emergency Medical Services	San Mateo County, excluding the City of South San Francisco	Paramedic fire responders were response-time compliant 93.7% of the time; emergency ambulances were response time compliant 93.2% of the time.	Required response times in urban areas: Priority 1: Paramedic fire responder within 6:59; emergency ambulance within 12:59 Priority 2: Paramedic fire responder within 14:59; emergency ambulance within 22:59
North County Fire Authority	Cities of Brisbane, Daly City, and Pacifica	7:00 or less for emergency incidents 96% of the time 11:00 or less to all incidents within 90% of the time	Not available

Fire Department	Service Area	Response Time (minutes:seconds)	Response Criteria (minutes:seconds)
South San Francisco Fire Department	City of South San Francisco	Priority 1 (paramedics on fire apparatuses): 7:00 or less 90% of the time Priority 2 (traveling with normal traffic flow): 15:00 or less 90% of the time Emergency Ambulances with Paramedics: 13:00 or less 90% of the time	Priority 1: Urban/Suburban ▪ Emergency Ambulance: 12:59 ▪ Paramedic, Fire Responder, Non-transport: 6:59 Rural ▪ Emergency Ambulance: 19:59 ▪ Paramedic, Fire Responder, Non-transport: 11:59 Remote ▪ Emergency Ambulance: 29:59 ▪ Paramedic, Fire Responder, Non-transport: 21:59 Priority 2: Urban/Suburban: ▪ Emergency Ambulance: 22:59 ▪ Paramedic, Fire Responder, Non-transport: 14:59 Rural ▪ Emergency Ambulance: 59:59 ▪ Paramedic, Fire Responder, Non-transport: 24:59 Remote ▪ Emergency Ambulance: 59:59 ▪ Paramedic, Fire Responder, Non-transport: 29:59
San Bruno Fire Department	City of San Bruno	First Response: 4:53	Response time within 6:59 90% of the time
Central County Fire Department	Cities of Millbrae, Burlingame, and Hillsborough	Priority 1: <6:59 Priority 2: not available Priority 3: <6.59	A first-in fire engine to arrive within 6:00 minutes 90% of the time Paramedic first-response service maximum response time of 6:59 for 90% of all emergency medical incidents
San Mateo Fire Department	Cities of San Mateo, Belmont, and Foster City	Priority 1 and First-In: 4:30 average response time	Priority 1: Respond within 6:30 90% of the time.
Belmont Fire Protection District	Cities of Belmont, Foster City, and San Mateo	Priority 1 and First-In: 4:50 average response time	Response times to most incidents must be under 6:00 85% of the time.
Redwood City Fire Department	Cities of San Carlos and Redwood City	Fire Response: 5:10	Response time goal of 6:59 90% of the time.

Fire Department	Service Area	Response Time (minutes:seconds)	Response Criteria (minutes:seconds)
Menlo Park Fire Protection District	Cities of Atherton, Menlo Park and East Palo Alto and some unincorporated areas of San Mateo County	Response to Emergency Medical and Fire Incidents: 5:53 for 90% of calls	First response units on scene within 7:00 90% of the time
Santa Clara County	**Local Responsibility Areas**		
Santa Clara County Fire Department	Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Monte Sereno, Saratoga, and adjacent unincorporated areas	In 2018: EMS Calls: Calls in urban and metropolitan areas responded to on average in 7:50 or less. Structure Fire Calls: First unit arrives to calls in urban and metropolitan areas on average 8:21 minutes or less.	EMS Calls: 90% of the time, a fire company with one paramedic arrives in under 8:00 Structure Fire Calls: 90% of the time, the first unit arrives in under 8:00
San Jose Fire Department	City of San Jose	In 2014-2015: SJFD responded to 73% of Priority 1 calls within 8:00. SJFD responded to 90% of Priority 2 calls within 13:00.	The SJFD response time standard is arrival within 8:00 80% of the time for Priority 1 incidents. The SJFD response time standard is arrival within 13:00 80 percent of the time for Priority 2 incidents.
Santa Clara County	**State Responsibility Areas**		
Santa Clara County Fire Department	Cities of Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Monte Sereno, Saratoga, and adjacent unincorporated areas	In 2018: EMS Calls: Calls in urban and metropolitan areas responded to on average in 7:50 or less. Structure Fire Calls: First unit arrives to calls in urban and metropolitan areas on average 8:21 or less.	EMS Calls: 90% of the time, a fire company with one paramedic arrives in under 8:00 Structure Fire Calls: 90% of the time, the first unit arrives in under 8:00
Palo Alto Fire Department	City of Palo Alto	First Responder for EMS: 8 minutes 95% of the time, with an average response time of 4:48 Paramedic Responder for EMS: 12:00 99% of the time Fire Response: 8:00 90% of the time, with an average response time of 5:27	First Responder for EMS: 8:00 90% of the time Paramedic Responder for EMS: 12:00 99% of the time Fire Response: 8:00 90% of the time

Fire Department	Service Area	Response Time (minutes:seconds)	Response Criteria (minutes:seconds)
Mountain View Fire Department	City of Mountain View	Fire Response for First-in Engine: 6:00 100% of time EMS Code 3: within 6:00 93% of time	Fire Response for First-in Engine: 6:00 100% of time EMS Code 3: within 6:00 for greater than 90% of the time
Sunnyvale Department of Public Safety Fire Services Bureau	City of Sunnyvale	Fire Response: 4:38 EMS: 4:01	There are no internal response time criteria for Sunnyvale fire calls; the City is planning to develop criteria for fire calls in FY 2020. EMS response standard is the same as the Santa Clara County-wide standard: 7:00

Sources: Belmont, Foster City, and San Mateo Fire Departments 2017; Boyle 2020; City of Palo Alto 2018; County of San Mateo 2016, 2017; Data Working Group 2018; Mountain View Fire Department 2015; Long 2018; Menlo Park Fire Protection District 2017; Redwood City City Manager 2016; North County Fire Authority 2016; Pucci 2020; Spaith 2018; City of San Jose 2015; Cresta 2019; Randolph 2019; Santa Clara County Fire Department n.d.
ALS = advanced life support
BLS = basic life support
EMS = emergency medical services
FY = fiscal year
SFO = San Francisco Airport
SFFD = San Francisco Fire Department
SJFD = San Jose Fire Department

Emergency vehicle response throughout the RSA is supported by the presence of emergency vehicle detection and preemptive signaling at roadway intersections. Emergency vehicle detection allows responders to communicate to traffic signals in advance of their arrival and have the signal provide a preemptive green indication in their direction of travel. This equipment is provided at some, but not all, of the intersections in the RSA. For example, the City of San Jose has installed EVP for certain areas of San Jose, covering more than 900 intersections within the city limits.

Law Enforcement Response

Security and law enforcement within and adjacent to the Caltrain right-of-way is provided by the San Mateo County Sheriff's Office Transit Police Bureau, which provides contracted law enforcement services to Caltrain and San Mateo County Transit District (SamTrans). The San Mateo County Sheriff's Office Transit Police Bureau is responsible for patrolling Caltrain rail equipment, transit stations, railroad rights-of-way, and facilities throughout San Francisco, San Mateo, and Santa Clara Counties. The Transit Police Bureau also is responsible for investigating crimes, collisions, accidents, and deaths involving SamTrans buses and Caltrain passenger trains. In 2015, Caltrain passengers placed 11,554 calls for police services and transit police made 188 felony and misdemeanor arrests, 937 infraction citations (excluding parking and traffic citations), 441 ejections, and 38 crisis interventions with emergency commitments (Caltrain 2015). Other security and enforcement agencies with jurisdiction in or near the right-of-way include BART police who patrol the Millbrae Station.

Emergency response by law enforcement to situations outside of the Caltrain right-of-way would be provided by the jurisdictions in the RSA, which consist of the City and County of San Francisco; San Mateo County; the Cities of Brisbane, South San Francisco, San Bruno, Millbrae, Burlingame, San Mateo, Belmont, San Carlos, Redwood City, Atherton, and Menlo Park; Santa Clara County; and the Cities of Palo Alto, Mountain View, Sunnyvale, Santa Clara, and San Jose. The San Francisco Police Department is responsible for general law enforcement for the 4th and King Street Station area. The San Jose Police Department is responsible for general law enforcement for the San Jose Diridon Station area. Information on service areas, response times,

and response criteria was obtained from published documents and websites and is summarized in Table 3.11-2.

Fire Department Response

The fire departments and types of equipment operating in the emergency service providers RSA are summarized in Table 5 in Volume 2, Appendix 3.11-A. Figure 3.11-1 through Figure 3.11-5 illustrate the locations of the fire stations. All fire departments serving the RSA consist of a combination of paid employees and volunteers. The municipal fire departments have mutual aid agreements with county fire protection services (and in some cases with other fire departments) to provide concurrent, cooperative response and assistance during emergencies.

Both local fire departments and emergency medical service agencies provide emergency medical services. Most calls received by fire departments in the emergency service providers RSA are for emergency medical services rather than fire services. Table 3.11-3 summarizes the response times and response time goals for fire departments and emergency medical services in the RSA. Response times are not always consistent with the applicable goals and objectives outlined in regional and local planning documents.

Contracted Emergency Ambulance Response

In addition to fire departments, contracted ambulances also provide first responder services. In the City and County of San Francisco portion of the RSA, emergency ambulance response services are provided by the San Francisco Fire Department, American Medical Response (AMR), and the King American Ambulance Company. Pro Transport-1, NORCal Ambulance, and Falck also provide ambulance services such as patient transport and other than emergency response services. The San Francisco Emergency Services Agency does not provide the specific locations of ambulance postings (e.g., stationing/staging locations).

In the San Mateo County portion of the RSA, the San Mateo Emergency Services Agency contracts with private ambulance services to provide emergency first responder/ambulance services as well as non-emergency ambulance services and ambulance hospital transport services. The current contractor (as of July 2019) for San Mateo County is AMR. Out of the 65,000 911 calls received for fiscal year 2016–2017, AMR responded to 56 percent of those calls, and local fire departments responded to the remaining 44 percent (County of San Mateo 2017). The deployment locations of emergency ambulances change depending on the time of day, the day, or the week; the San Mateo Emergency Services Agency does not provide information on their specific locations to the public for security reasons.

In the Santa Clara County portion of the RSA, the Santa Clara Emergency Services Agency contracts with private ambulance services to provide emergency first responder/ambulance services, as well as non-emergency ambulance services and ambulance hospital transport services. The current contractor (as of July 2019) for Santa Clara County is Rural/Metro. The ambulance deployment plan is fluid. Ambulances post at locations identified within the county based upon how many are available and are moved throughout the county on a regular basis to cover the areas of need. As such, the specific posting locations for contracted ambulances could not be identified. Table 3.11-4 shows the response times that contracted responders are required to comply with at least 90 percent of the time.

Local agencies also set standard response times for contracted ambulance services. In the City and County of San Francisco, from March 2017 to March 2019, first responders (including both fire department and contracted ambulance services) met the standards listed in Table 3.11-4 a total of 90 percent or more of the time for Code 2 ambulance, Code 3 ambulance, and first responder advanced life support response types (City and County of San Francisco 2017). Basic life support first responder responses met the standards listed in Table 3.11-4 between 78 and 84 percent of the time between March 2017 and March 2019 (City and County of San Francisco 2017). In San Mateo County during fiscal year 2016–2017, contracted emergency ambulance services met the standards listed in Table 3.11-4 90 percent or more of the time in all response zones in the RSA (County of Santa Mateo 2017). In Santa Clara County in 2017, contracted emergency ambulance services met the standards listed in Table 3.11-4 90 percent or more of

the time in all response zones every month (County of Santa Clara 2014). In the first 4 months of 2019, emergency ambulance services in Santa Clara County met the standards listed in Table 3.11-4 at least 90 percent of the time in all response zones (County of Santa Clara 2019).

Table 3.11-4 Required Response Times for Contracted Ambulance Services

	Required Response Time (minutes:seconds)		
City and County of San Francisco			
Type of Response[1,2]	BLS and AED on Scene	ALS on Scene	Transport on Scene
Code 3 (red lights and siren)	4:30	7:00	10:00
Code 2 (no red lights or siren)	NA	20:00	20:00
Code 1	NA	60:00	60:00
Non-urgent	NA	240:00	240:00
San Mateo County			
Type of Response	Urban/Suburban	Rural	Remote
Paramedic Fire Responder, non-transport (Priority 1)	6:59	11:59	21:59
Emergency Ambulance (Priority 1)	12:59	19:59	29:59
Paramedic Fire Responder, non-transport (Priority 2)	14:59	24:59	59:59
Emergency Ambulance (Priority 2)	22:59	59:59	59:59
Santa Clara County			
Type of Response	Metro/Urban Areas	Suburban/Rural Areas	Wilderness Areas
BLS and CPR capable first responder	07:59	09:59	11:59
Early defibrillation responder	07:59	09:59	11:59
ALS responder	07:59	09:59	11:59
Transport Ambulance	11:59	16:59	21:59

Sources: County of San Mateo 2017; County of Santa Clara 2014; San Francisco Emergency Medical Services Agency 2013
These standards are required to be met 90% of the time or greater. Most of the RSA is within areas defined as "Metro/Urban areas."
AED = automated external defibrillator
ALS = advanced life support
BLS = basic life support
CPR = cardiopulmonary resuscitation
[1] If a private ambulance provider cannot respond within 60 minutes to a non-emergency situation, the ambulance provider shall attempt to transfer the call to another permitted provider. Only if another provider is unavailable or if there is question, ALS will respond.
[2] See above note. In addition, ALS providers may refer caller to permitted BLS provider.

3.11.5.2 Community Safety and Security

Motor Vehicles and Highways

In 2017, California was ranked second in the nation for the most highway-rail grade crossing incidents, first for the number of highway-rail grade crossing fatalities, and third for the number of railroad accidents (FRA 2018g, 2018h, 2018i). There were 82 highway-rail grade crossing incidents in the City and County of San Francisco (4), San Mateo County (38), and Santa Clara County (40) from January 2011 to December 2017 (see Table 1 in Volume 2, Appendix 3.11-A).

These incidents resulted in 18 highway-rail crossing fatalities, with 1 in the City and County of San Francisco, 5 in San Mateo County, and 12 in Santa Clara County (FRA 2018a, 2018b, 2018c). Approximately 62 percent of the highway-rail grade crossing incidents (51 of the 82 total incidents) involved motor vehicles. The highest rates of incidences during this period occurred at Broadway Avenue in Burlingame, Charleston Road and East Meadow Drive in Palo Alto, and 16th Street in San Francisco. Volume 2, Appendix 3.11-A presents additional information on train accidents and incidents and Volume 2, Appendix 2-B provides information on the existing road-railroad crossings and existing pedestrian-railroad crossings in the RSA.

Recognizing the need to improve safety and circulation for pedestrians, bicyclists, and vehicles by eliminating conflicts with trains, local jurisdictions have been conducting feasibility studies and planning studies for grade-separation projects along the project corridor. Grade-separation projects identified or under construction at the time of this analysis include the following:

- 16th Street and Mission Bay Boulevard, San Francisco (planning phase)—*Rail Alignment and Benefits Study* (City and County of San Francisco 2018b)
- Linden Avenue, South San Francisco (planning phase, joint study with adjacent Scott Street crossing below)—Planning Study Presentation (City of South San Francisco 2018)
- Scott Street, San Bruno (planning phase)—Staff Report (City of San Bruno 2018)
- Broadway Avenue, Burlingame (ready for environmental planning)—Project Study Report (City of Burlingame 2017)
- 25th Avenue Grade-Separation Project, San Mateo (construction completion anticipated late 2021)
- Whipple Avenue, Redwood City (planning phase)—Feasibility Study (City of Redwood City 2020)
- Ravenswood Avenue Railroad Crossing Project, Menlo Park (planning phase)—Project Study Report (City of Menlo Park 2019)
- Alma Street, Churchill Avenue, East Meadow Drive, Charleston Road, Palo Alto (planning phase)—Connecting Palo Alto (City of Palo Alto 2019)
- Castro Street and Rengstorff Avenue, Mountain View (planning phase)—Design Concepts Final Report (City of Mountain View 2014)
- Mary Avenue and Sunnyvale Avenue, Sunnyvale (planning phase)—Feasibility Study (City of Sunnyvale 2019)

Pedestrians and Bicycles

The safety and security RSA contains many existing pedestrian and bicycle facilities. Of these, 41 at-grade roadway crossings of the railway have sidewalks and marked pedestrian crossings for safe pedestrian movement. There are also 12 existing pedestrian crossings separate from the roadway crossings, many of them at Caltrain stations. Some of the at-grade crossings have Class II bikeway facilities (i.e., lanes for cyclists adjacent to the outside travel lane of the roadway, with special lane markings, pavement legends, and signs) near the at-grade crossings. Other at-grade crossings have Class III bikeway facilities (i.e., signed for bicycle use but with no separate or exclusive right-of-way or lane striping on the roadway). Pedestrian and cyclist safety issues associated with the Caltrain tracks in the RSA primarily result from the conflict between pedestrians and cyclists and trains on at-grade crossings. Between January 2011 and December 2017, highway-rail grade crossing incidents involving pedestrians alone accounted for approximately 38 percent of the 82 highway-rail grade crossing incidents in San Francisco, San Mateo, and Santa Clara Counties.

In addition to pedestrian and cyclist safety concerns at the at-grade crossings, California ranked first in the nation in pedestrian rail-trespass fatalities,[12] with 57 fatalities statewide in 2017 (FRA 2018j). Between January 2011 and December 2017, there were 4 trespasser fatalities in San Francisco County, 19 in San Mateo County, and 31 in Santa Clara County, accounting for 54 trespasser fatalities in the three-county area. Caltrain addresses safety through education in the form of safety awareness campaigns and suicide prevention resources, enforcement through transit police intervention, and engineering and infrastructure improvements to reduce pedestrian ability to access the rail line outside of designated roadway crossings. Volume 2, Appendix 3.11-A provides information on the at-grade crossing incidents and Volume 2, Appendix 2-B provides information on existing railroad crossings.

The following Caltrain stations have pedestrian overpasses or underpasses of the Caltrain railway: Bayshore, San Bruno, Millbrae, San Mateo, Hayward Park, Hillsdale, Belmont, San Carlos, Redwood City, Menlo Park, Palo Alto, California Avenue, San Antonio, Mountain View, Evelyn, Sunnyvale, and Lawrence Caltrain Stations. The planned South San Francisco Caltrain Station Improvement Project (construction anticipated to be complete in 2021) would build a pedestrian underpass at the South San Francisco Caltrain Station. As such, when completed, only two Caltrain Stations—the Broadway Station in Burlingame (Alternatives A and B) and the College Park Station in San Jose (under Alternative A)—would require passengers to cross an active track in order to board and alight from trains. At these stations, the train operation hold-out rule is in effect, which requires an oncoming train to stop outside of the station zone until passengers are safely clear of the tracks. Outside of the Caltrain stations, pedestrian underpasses are also provided at Sylvan Avenue in San Bruno and F Street and Arroyo Avenue in San Carlos. At-grade pedestrian crossings of the Caltrain right-of-way are located at Santa Paula Avenue in Millbrae and Morrell Avenue in Burlingame.

Railroad Operations

Passenger Rail

Existing passenger rail services along the Project Section include Caltrain and BART. The PCJPB owns the corridor between San Francisco and San Jose and operates the Caltrain commuter rail service south to San Jose. As of 2018, Caltrain operates 92 weekday trains, including Baby Bullets (express), limited, and local services (Caltrain 2018). The average weekday Caltrain ridership in 2018 was approximately 65,095, a 1.5 percent increase from 2017 (64,114). When ranked by average mid-weekday boardings, 4th and King Street (first with 15,427), San Jose Diridon (third with 4,876) and Millbrae (seventh with 3,340) Stations all ranked in the top 10 stations on the Caltrain corridor (Caltrain 2018). Existing passenger rail services connecting at the San Jose Diridon Station are Caltrain, Santa Clara Valley Transportation Authority light rail, Altamont Corridor Express, and Amtrak. As of December 2020, PTC has been implemented by PCJPB and certified by the FRA as part of the Caltrain Modernization Program. This system provides the Caltrain corridor with enhanced safety features that will monitor and, when necessary, control train movement in the event of operational incidents.

BART provides passenger rail transit service between downtown San Francisco and cities in the northern portion of the San Francisco Peninsula, including Millbrae, and the East Bay cities of Oakland, Berkeley, Fremont, Walnut Creek, and Dublin/Pleasanton. The average weekday ridership in 2016 was approximately 433,000 (BART 2017). Two proposed HSR stations would connect directly to BART. The Millbrae Station would connect to the Richmond and the Antioch BART lines, which are served by 75 weekday trains, and the San Jose Diridon Station would connect to the Warm Springs/South Fremont line upon completion of the BART Silicon Valley Phase 2 Extension from Berryessa/North San Jose through downtown San Jose to Santa Clara.

[12] By definition, trespassers are illegally on private railroad property without permission. They are most often pedestrians who walk across or along railroad tracks as a shortcut to another destination. Some trespassers are loitering; some are engaged in recreational activities such as jogging, hunting, bicycling, snowmobiling, or operating off-road, all-terrain vehicles (FRA 2016).

Freight Rail

Union Pacific Railroad (UPRR) provides freight rail service in the Project Section. Freight operations primarily occur during evening and night hours. On average, UPRR operates three round-trip freight trains per weekday between control point (CP) Coast and San Francisco. Within the Project Section, the freight trains and Caltrain passenger trains both use the same tracks in the Caltrain corridor north of CP Coast.

At-Grade Crossing Conditions

All of the at-grade crossings along the Caltrain corridor between San Francisco and San Jose have gates on the entry lanes (two-quadrant gates), with the exception of Fair Oaks Lane in Atherton, which has four-quadrant gates. Some of the existing at-grade crossings have median separators to prevent drivers from going around lowered gates by using the opposite travel lane. At-grade crossings with existing median separators include:

- Median separators on both sides of the track (22): San Francisco (Mission Bay Drive, 16th Street), San Bruno (Scott Street), Millbrae (Center Street), Burlingame (Broadway Avenue, Oak Grove Avenue, North Lane, Howard Avenue, Bayswater Avenue, Peninsula Avenue), San Mateo (Villa Terrace, Bellevue Avenue, Ninth Avenue), Redwood City (Whipple Avenue, Brewster Avenue, Chestnut Street), Menlo Park (Ravenswood Avenue), Palo Alto (Alma Avenue), Mountain View (Rengstorff Avenue, Castro Avenue), Sunnyvale (Mary Avenue), San Jose (West Virginia Street).
- Median separators on one side of the track (12): South San Francisco (Linden Avenue), San Mateo (Fourth Avenue, Fifth Avenue), Redwood City (Broadway Avenue, Maple Street, Main Street), Menlo Park (Encinal Avenue), Palo Alto (Churchill Avenue, East Meadow Drive, Charleston Road), Sunnyvale (Sunnyvale Avenue), San Jose (Auzerais Avenue).

There are 7 at-grade crossings in this corridor with no median separators: San Mateo (First Avenue, Second Avenue, Third Avenue), Atherton (Fair Oaks Lane, Watkins Lane), Menlo Park (Glenwood Avenue, Oak Grove Avenue).

Existing at-grade crossings between San Francisco and San Jose vary as to whether the railroad preemption is interconnected with adjacent traffic signals as follows:

- At-grade crossings with railroad preemption connected to adjacent traffic signals (22): San Francisco (Mission Bay Drive, 16th Street), South San Francisco (Linden Avenue), Burlingame (Broadway Avenue, Oak Grove Avenue, Howard Avenue, Peninsula Avenue), San Mateo (First Avenue, Second Avenue, Third Avenue, Fourth Avenue, Fifth Avenue) Redwood City (Whipple Avenue, Brewster Avenue, Broadway Avenue), Menlo Park (Ravenswood Avenue), Palo Alto (Churchill Avenue, East Meadow Drive, Charleston Road), Mountain View (Rengstorff Avenue, Castro Avenue), Sunnyvale (Mary Avenue, Sunnyvale Avenue).
- Crossings with no adjacent traffic signals (19): San Bruno (Scott Street), Millbrae (Center Street), Burlingame (North Lane, Bayswater Avenue), San Mateo (Villa Terrace, Bellevue Avenue, Ninth Avenue), Redwood City (Maple Street, Main Street, Chestnut Street), Atherton (Fair Oaks Lane, Watkins Lane), Menlo Park (Encinal Avenue, Glenwood Avenue, Oak Grove Avenue, Ravenswood Avenue), Palo Alto (Alma Avenue), San Jose (Auzerais Avenue, West Virginia Street).

Railroad Accident/Incident Data

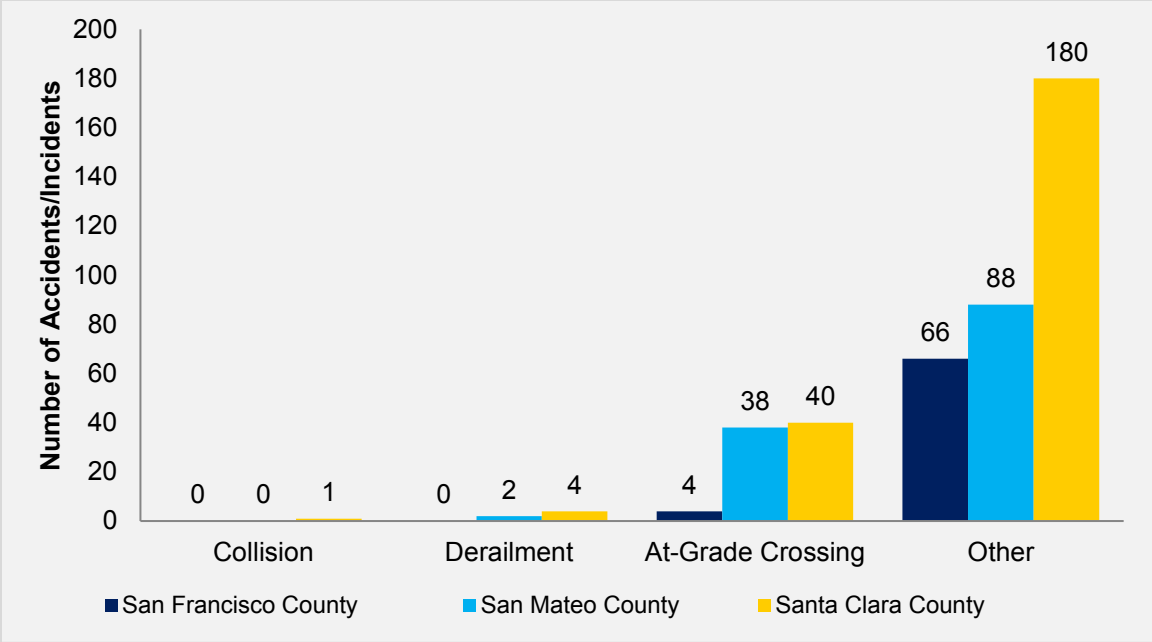
According to FRA accident/incident reporting data, 423 railroad accidents/incidents occurred in San Francisco, San Mateo, and Santa Clara Counties within the railroad right-of-way between

January 1, 2011, and December 31, 2017 (FRA 2018a, 2018b, 2018c).[13] Of these accidents/incidents, 82 were at-grade crossing accidents/incidents, 1 was a train collision, 6 were train derailments, and the remaining 334 were other types of incidents (e.g., trespassing incidents and activities such as getting on or off equipment, doing maintenance work, throwing switches, setting handbrakes, stumbling and tripping). Figure 3.11-6 illustrates the breakdown by type of accidents/incidents by county and illustrates that the greatest number of accidents/incidents of all types have occurred in Santa Clara County.

Of the 423 railroad accidents/incidents in the three-county region between 2011 and 2017, there were 74 fatalities and 292 nonfatal injuries. Figure 3.11-7 illustrates the number of accidents/incidents and casualties by county. Of the 5 fatalities in the City and County of San Francisco, 4 were trespasser fatalities and 1 was a highway-rail crossing fatality. Of the 25 fatalities in San Mateo County, 19 were trespasser fatalities and 6 were highway-rail crossing fatalities. Of the 44 fatalities in Santa Clara County, 31 were trespasser fatalities and 13 were highway-rail crossing fatalities.

Most accidents/incidents were trespassing incidents (78 percent) and highway-rail crossing accidents (19 percent), with collision and derailment comprising a small percentage of the total (1.6 percent). Between 2011 and 2017, two derailments occurred in San Mateo County and one collision and four derailments occurred in Santa Clara County (FRA 2018a, 2018b, 2018c). Volume 2, Appendix 3.11-A provides detailed information on these railroad-related accidents, and Volume 2, Appendix 2-B provides information on existing railroad crossings.

[13] A railroad *accident/incident* is the term used to describe the entire list of events reportable to the FRA. These consist of collisions, derailments, and other events involving the operation of on-track equipment and causing reportable damage above an established threshold; impacts between railroad on-track equipment and highway users at crossings; and all other incidents or exposures that cause a fatality or injury to any person, or an occupational illness to a railroad employee.



Sources: FRA 2018a, 2018b, 2018c

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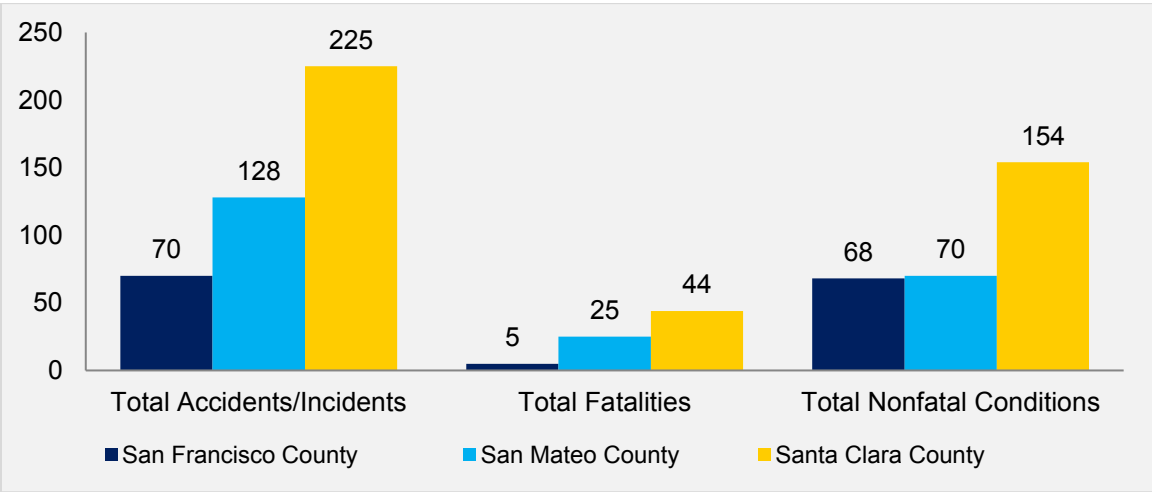
Figure 3.11-6 Type of Railroad Accidents/Incidents by County, 2011–2017



Sources: FRA 2018a, 2018b, 2018c

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Figure 3.11-7 Total Railroad Accidents/Incidents and Casualties by County, 2011–2017

Airports, Heliports, and Airstrips

Table 3.11-5 lists the airports and heliports within the airport RSA. Five airports, five heliports, and no private airstrips were identified (Caltrans 2018, 2019). CLUPs from county airport land use commissions regulate land use within airport safety zones to minimize airport hazards and risks of accidents. As public-service airports, SFO, SQL, Palo Alto Airport, Moffett Field, and SJC are subject to land use planning requirements of individual airport CLUPs. As detailed in Volume 2, Appendix 3.11-B the RSA overlaps with areas covered by airport CLUPs for SFO, SQL, Palo Alto Airport, Moffett Field, and SJC (City/County Association of Governments of San Mateo County 2012, 2015; County of Santa Clara 2016a, 2016b, 2016c).

Table 3.11-5 Airports and Heliports in the Airport Resource Study Area

Facility	Type	County	Distance from Track Centerline (miles)
University of California, San Francisco Medical Center Mission Bay Building Heliport	Private	San Francisco	0.17
San Francisco International Airport	Public	San Mateo	0.22
San Carlos Airport	Public	San Mateo	0.46
Mills Peninsula Medical Center Heliport	Private	San Mateo	0.24
Palo Alto Airport	Public	Santa Clara	2.24
Moffett Federal Airfield	Private	Santa Clara	1.16
Stanford Hospital Heliport	Private	Santa Clara	0.75
Norman Y. Mineta San Jose International Airport	Public	Santa Clara	0.30
Santa Clara Towers Helipad	Private	Santa Clara	1.04
Santa Clara Valley Medical Center Heliport	Private	Santa Clara	1.92

Sources: Caltrans 2018, 2019; County of Santa Clara 2016b, 2016c

Five privately operated heliports in San Francisco, San Mateo, and Santa Clara Counties are in the RSA. These heliports are located at the Santa Clara Towers building in San Jose, Santa Clara Valley Medical Center in San Jose, Mills Peninsula Hospital in Burlingame, Stanford Hospital in Palo Alto, and University of California, San Francisco Medical Center Mission Bay building in San Francisco. The five heliports are rooftop facilities associated with medical center and residential high-rise properties.

In addition, these airports and heliports are subject to airport CLUPs (County of Santa Clara 2016a, 2016b). Each CLUP identifies the AIA for each airport. Appendix 2-I in Volume 2 references each airport CLUP as a regional policy. The FAR Part 77 (14 C.F.R. Part 77) defines obstruction standards as elevations above which structures may constitute a safety hazard to air navigation. A FAR Part 77 airspace surface is an imaginary surface of a takeoff and landing area of an airport or any other imaginary surface established for the airport under 14 C.F.R. Section 77.24. Any penetrations of the FAR Part 77 surface are subject to agency review. If a safety hazard is found to exist, the FAA may issue a determination of a hazard to air navigation. If the FAA determines that a proposed structure would be an obstruction, the FAA may recommend mitigation. The FAA does not have authority to prevent encroachment; however, under California law, the state can prevent the encroachment if the FAA has issued a determination of a hazard to air navigation. The local jurisdiction can establish and enforce height restrictions (County of Santa Clara 2016b).

Appendix 3.11-B in Volume 2 provides a detailed analysis of the project's relationship to the AIA and each airport. The online FAR Part 77 Notice Criteria Tool (FAA 2018a) was also used to assess FAA notification requirements for proposed construction of the project alternatives. Airport

master plans and land use compatibility plans from county airport land use commissions regulate land use within airport safety zones to minimize airport hazards and risk of accidents. Compliance with FAR Part 77 and airport land use commission CLUPs serves to minimize airport hazards and risk of accidents. The project alternatives would encroach into the AIA of SFO, SQL, Moffett Field Airport, and SJC but would not encroach on the AIA of Palo Alto Airport.

Schools

Table 3.11-6 lists the public and private schools in the schools RSA by subsection. These facilities were evaluated to determine the potential safety hazards posed to schools by the project alternatives in the event of a train derailment during operations. There are 66 public and private schools in the schools RSA. Of these schools, 11 are in the San Francisco to South San Francisco Subsection, 13 in the San Bruno to San Mateo Subsection, 24 in the San Mateo to Palo Alto Subsection, 10 in the Mountain View to Santa Clara Subsection, and 8 in the San Jose Diridon Station Approach Subsection.

Table 3.11-6 Schools within the Schools Resource Study Area by Subsection

Facility	Distance from Alternative A Project Footprint (miles)	Distance from Alternative B Project Footprint (miles)[1]	Direction from Alternatives	City
San Francisco to South San Francisco Subsection				
RISE Institute	0.06	0.06	West	San Francisco
Enchantment Institute	0.19	0.19	West	San Francisco
City College of San Francisco—Southeast Center	0.01	0.01	East	San Francisco
Webster (Daniel) Elementary	0.14	0.14	West	San Francisco
Dr. Charles Drew College Preparatory Academy	0.06	0.06	East	San Francisco
KIPP Bayview Academy	0.07	0.07	East	San Francisco
Five Keys Independence High School (SF Sheriff's)	0.23	0.23	West	San Francisco
Five Keys Independence Adult Charter School (SF Sheriff's)	0.23	0.23	West	San Francisco
Brown Jr. (Willie L.) Middle School	0.18	0.18	West	San Francisco
Brisbane Elementary	0.22	0.22	West	Brisbane
Lipman Middle	0.20	0.20	West	Brisbane
San Bruno to San Mateo Subsection				
Belle Air Elementary School	0.07	0.07	East	San Bruno
Lomita Park Elementary	0.01	0.01	West	San Bruno
Mills High	0.11	0.11	West	Millbrae
St. Dustan's Elementary	0.22	0.22	West	Millbrae
Burlingame High School	0.01	0.01	East	Burlingame
Washington Elementary	0.08	0.08	East	Burlingame
St. Catherine of Siena Elementary	0.21	0.21	West	Burlingame

Facility	Distance from Alternative A Project Footprint (miles)	Distance from Alternative B Project Footprint (miles)[1]	Direction from Alternatives	City
Genius Learning	0.11	0.11	East	Burlingame
Pacific Rim International School	0.16	0.16	East	San Mateo
San Mateo High School	0.14	0.14	East	San Mateo
Stanbridge Academy	0.06	0.06	East	San Mateo
College Park Elementary	0.18	0.18	East	San Mateo
St. Matthew's Episcopal Day School at Baldwin	0.18	0.18	West	San Mateo
San Mateo to Palo Alto Subsection				
Sunnybrae Elementary	0.11	0.11	East	San Mateo
George Hall Elementary School	0.22	0.21	East	San Mateo
La Escuelita Christian Academy	0	0	West	San Mateo
The Burkard School	0	0	West	San Mateo
Centennial Montessori	0.22	0.22	West	San Mateo
Central Elementary	0.04	0.04	West	Belmont
Nesbit Elementary	0.13	0.13	East	Belmont
Redwood High School	0.01	0.01	East	Redwood City
Orion Alternative	0.10	0.10	East	Redwood City
Creative Learning Center	0.10	0.10	East	Redwood City
Sequoia High	0.04	0.04	West	Redwood City
Wings Learning Center	0	0	West	Redwood City
Everest Public High	0.23	0.23	East	Redwood City
Hoover Elementary	0.21	0.21	East	Redwood City
Menlo College	0.15	0.15	West	Atherton
Sequoia District Adult Education	0.18	0.18	East	Menlo Park
Nativity Catholic School	0.12	0.12	East	Menlo Park
Lydian Academy	0.07	0.07	West	Menlo Park
Garfield Elementary	0	0	East	Menlo Park
Castilleja School	0.12	0.12	East	Palo Alto
Stanford University	0.07	0.07	West	Palo Alto
Palo Alto High (includes Palo Alto Special Education and Adult Education)	0	0	East	Palo Alto
El Carmelo Elementary	0.14	0.14	East	Palo Alto
Keys School, Middle Campus	0.16	0.16	West	Palo Alto

Facility	Distance from Alternative A Project Footprint (miles)	Distance from Alternative B Project Footprint (miles)[1]	Direction from Alternatives	City
Mountain View to Santa Clara Subsection				
Edith Landels Elementary	0.22	0.22	West	Mountain View
Mountain View Academy	0.21	0.21	South	Mountain View
Waldorf School of the Peninsula - Mountain View Campus	0.09	0.09	East	Mountain View
Khan Lab School	0	0	West	Mountain View
View High School	0.01	0.01	West	Mountain View
Mountain View Los Altos Adult Education	0.24	0.24	East	Mountain View
Vargas Elementary	0.15	0.15	West	Sunnyvale
Adrian Wilcox High	0.24	0.24	West	Santa Clara
Bracher Elementary	0.08	0.08	West	Santa Clara
Santa Clara Christian	0.09	0.09	West	Santa Clara
San Jose Diridon Station Approach Subsection				
Santa Clara University	0.09	0.09	East	Santa Clara
Scott Lane Elementary	0.18	0.18	South	Santa Clara
Center for Employment Training - San Jose	0.18	0.09	East	San Jose
Gardner Elementary School	0.06	0.01	West/East	San Jose
Rocketship Mateo Sheedy Elementary School	0.22	0.12	South/East	San Jose
Bellarmine College Preparatory	0	0	West	San Jose
Sacred Heart Nativity School	0.17	0.12	East	San Jose
Our Lady of Grace	0.17	0.12	East	San Jose

Sources: Authority 2019a, 2019b
I- = Interstate
[1] The number of schools in the RSA is the same for Alternative B (Viaduct to I-880) and Alternative B (Viaduct to Scott Boulevard).

Landfills

Landfills in the landfill RSA were evaluated for their potential to release methane gas, which may present an explosion risk during HSR construction and operations. The former Brisbane Landfill site is east of Tunnel Avenue, between Beatty Avenue and Lagoon Road in Brisbane. The landfill actively received waste from 1932 to 1967. While activities have ceased at the landfill, methane gas and leachate from decomposing material is still being generated, which requires treatment and monitoring. More information about the site is available in Section 3.10.

Oil and Gas Wells

The Authority reviewed oil, gas, and geothermal resources using the Well Finder online GIS mapping program (California Division of Oil, Gas, and Geothermal Resources 2019) to identify oil,

gas, and geothermal wells in the RSA and within 0.25 mile of the project footprint. There are no oil, gas, or geothermal wells in the oil and gas well RSA.

Flooding

Floodplains and potential impacts from flooding, dam failure, and inundation are discussed in greater detail in Sections 3.8 and 3.9. Figure 3.9-12 illustrates the locations of dams in the high-risk facilities RSA. A portion of the RSA is located within floodplains that become inundated during the 100-year flood, which has a 1 percent chance of occurring annually, and regulated floodways are located within the RSA. Figure 3.8-6 and Table 3.8-12 show the Federal Emergency Management Agency-designated floodplains within the high-risk facility RSA.

Valley Fever

Valley fever is a fungal infection caused by coccidioides organisms (*coccidioidomycosis* or *cocci*). The fungal infection can be caused by inhalation of fungus in airborne dust after soil disturbance. The fungus that causes Valley fever resides in the soil and thrives in dry dirt and desert-like weather conditions. People who contract the fungal infection develop flu-like symptoms, including fever, chest pain, muscle or joint aches, and coughing. The fungus thrives in the arid desert soils, such as those located in California's Central Valley and therefore most cases in California are reported in this region. Cases of Valley fever have, however, been reported in the City and County of San Francisco, San Mateo County, and Santa Clara County; as such, Valley fever would be a concern under both project alternatives. The number of reported Valley fever cases in California has increased since 2001, with 7,466 documented cases in 2017 (California Department of Public Health [CDPH] 2018). The incidence rate in the three-county region was as follows:

- The incidence rate in San Francisco increased from 0.4 case per 100,000 people in 2012 to 1.5 cases per 100,000 people in 2017.
- The incidence rate in San Mateo County declined from 2.2 cases per 100,000 people in 2012 to 1.9 cases per 100,000 people in 2017.
- The incidence rate in Santa Clara County increased from 1.4 cases per 100,000 people in 2012 to 2.0 cases per 100,000 people in 2017.

However, the CDPH reported that the incidence rate data for the City and County of San Francisco and San Mateo County are potentially unreliable, with relative standard error of 23 percent or more (CDPH 2018).

High-Risk Facilities, High-Risk Utilities, and Fall Hazards

High-risk facilities, high-risk utilities, and fall hazards were investigated in the high-risk facilities RSA. These facilities include landfills, oil and natural gas wells, cement plants, ethanol plants, gas plants, industrial plants, power plants, refineries, wastewater treatment facilities, and dams. High-risk utilities include electric transmission lines, pipelines, and other utilities that cross or run parallel to the project footprint. Fall hazards include bridges and signal overcrossing structures that overarch the HSR right-of-way and industrial facilities with tall structures that are adjacent to the HSR right-of-way.

There may be propane, bulk fuel, and bulk chemical storage facilities located in industrial areas of the RSA, some of which may be adjacent to railroads and highways. Section 3.10 (Table 3.10-4 and Figure 3.10-2) identifies and discusses sites with potential environmental concerns (PEC) in the RSA. These PEC sites potentially have contamination from hazardous material releases and may contain aboveground and underground bulk storage tanks or other bulk hazardous material storage on-site.

High-risk utilities (including natural gas and petroleum pipelines, electric transmission lines, and other utilities) within and near the project footprint related to public utilities and energy are discussed in Section 3.6. Section 3.10 also discusses high-risk PEC facilities. The municipal and county emergency response and fire departments follow standard emergency response protocols

for industrial sites when responding to emergencies at high-risk facilities in accordance with the emergency operations plans for the departments.

Volume 2, Appendix 3.6-A, Table 1, identifies the high-risk utilities in the RSA (crossing or parallel to the alignment) that could pose safety hazards to the project in the event of an incident. For Alternative A, there are 260 high-risk utilities in the RSA including 65 electrical lines, 23 natural gas lines, 11 petroleum (fuel oil) lines, 52 communications lines, 58 stormwater drains and canals, 26 sewer lines, and 25 potable water lines. For Alternative B (Viaduct to I-880), there are 256 high-risk utilities in the RSA including 73 electrical lines, 2 electrical substations, 23 natural gas lines, 7 petroleum (fuel oil) lines, 40 communications lines, 63 storm drains and canals, 23 sewer lines, and 25 potable water lines. For Alternative B (Viaduct to Scott Boulevard), there are 249 high-risk utilities in the RSA including 71 electrical lines, 1 electrical substation, 22 natural gas lines, 7 petroleum (fuel oil) lines, 38 communications lines, 63 storm drains and canals, 23 sewer lines, and 24 potable water lines.

High-risk facilities within 2 miles of the project footprint that could pose safety hazards to the project in the event of an incident are illustrated on Figure 3.11-1 through Figure 3.11-5 and are shown in Table 3.11-7. These facilities include WWTPs, electric power plants, landfills, fuel tanks and fuel terminals, and dams and reservoirs. No cement/lime plants were identified within the high-risk facility RSA. For Alternative A, there are a total of 166 high-risk facilities within 2 miles of the project footprint. These facilities include 3 electric power plants, 110 WWTPs, and 44 active or closed landfills and waste transfer/processing facilities, 7 dams and reservoirs, and 2 fuel terminals. For Alternative B (both viaduct options), there are a total of 168 high-risk facilities within 2 miles of the project footprint. These facilities include 3 electric power plants, 112 WWTPs, and 44 active or closed landfills and waste transfer/processing facilities, 7 dams and reservoirs, and 2 fuel terminals.

Table 3.11-7 High-Risk Facilities within 2 Miles of the Project Footprint

Subsection	Electric Power Plants	Wastewater Treatment Plants	Landfills and Transfer Facilities	Dams and Reservoirs	Fuel Tanks/ Terminals	Total
Alternative A						
San Francisco to South San Francisco	2	36	19	2	2	61
San Bruno to San Mateo	0	8	4	2	0	14
San Mateo to Palo Alto	0	30	9	3	0	42
Mountain View to Santa Clara	0	10	0	0	0	10
San Jose Diridon Station Approach	1	26	12	0	0	39
Total (Alternative A)	**3**	**110**	**44**	**7**	**2**	**166**
Alternative B[1]						
San Francisco to South San Francisco	2	36	19	2	2	61
San Bruno to San Mateo	0	8	4	2	0	14
San Mateo to Palo Alto	0	30	9	3	0	42
Mountain View to Santa Clara	0	10	0	0	0	10
San Jose Diridon Station Approach	1	28	12	0	0	41
Total (Alternative B)	**3**	**112**	**44**	**7**	**2**	**168**

[1] The number of high-risk facilities in the resource study area is the same for Alternative B (Viaduct to I-880) and Alternative B (Viaduct to Scott Boulevard).

Tall structures could pose a safety hazard because of their potential to fall onto HSR structures due to accidents, including fall hazards, high wind events, other severe weather events, or terrorist acts. Tall structures are defined as structures that overarch the project alignment (e.g., bridges) and structures for which the combination of the structure's height and distance from the project footprint is such that the structure (or debris from the structure) could fall onto the project footprint in the event of an incident. Tall structures within the high-risk facilities RSA consist of vehicle bridges, pedestrian bridges, signal overcrossing structures, and buildings. Table 3.11-8 summarizes the tall structures within 2 miles of the project footprint that could pose safety hazards.

Table 3.11-8 Existing Tall Structures within 2 Miles of the Project Footprint

Subsection	Bridges	Signal Overcrossings	Other Tall Structures	Total
Alternative A				
San Francisco to South San Francisco	18	8	2	28
San Bruno to San Mateo	4	3	0	7
San Mateo to Palo Alto	4	5	2	11
Mountain View to Santa Clara	12	4	2	18
San Jose Diridon Station Approach	6	5	4	15
Total (Alternative A)	**44**	**25**	**10**	**79**
Alternative B[1]				
San Francisco to South San Francisco	18	8	2	28
San Bruno to San Mateo	4	3	0	7
San Mateo to Palo Alto	4	5	2	11
Mountain View to Santa Clara	12	4	2	18
San Jose Diridon Station Approach	5	1	1	7
Total (Alternative B)	**43**	**21**	**7**	**71**

I- = Interstate

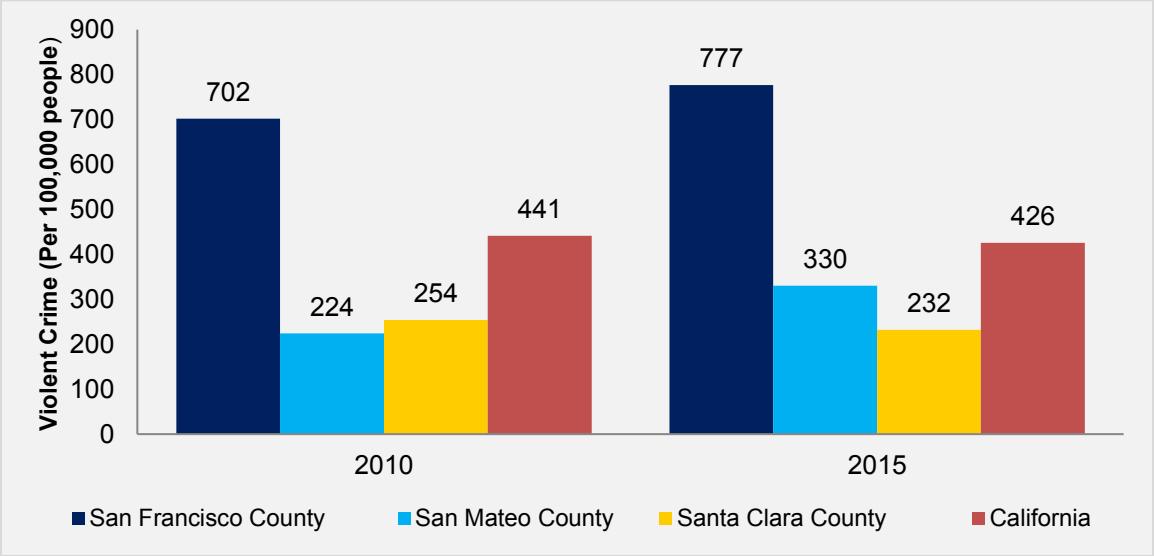
[1] The number of tall structures in the resource study area is the same for Alternative B (Viaduct to I-880) and Alternative B (Viaduct to Scott Boulevard).

In total, there are 64 bridges and other tall structures within the San Francisco to South San Francisco, San Bruno to San Mateo, San Mateo to Palo Alto, and Mountain View to Santa Clara Subsections for both project alternatives, including 38 bridges, 20 signal overcrossings, and 6 other tall structures (e.g., buildings). There are 15 bridges and other tall structures within 2 miles of the project footprint of the San Jose Diridon Station Approach Subsection for Alternative A and 7 bridges and other tall structures for Alternative B (both viaduct options). These structures are 6 bridges, 5 signal overcrossings, and 4 other tall structures for Alternative A and 5 bridges, 1 signal overcrossing, and 1 other tall structure for Alternative B.

3.11.5.3 Security

The Authority collected data on crime rates for both violent crime and property crime from the FBI National Uniform Crime Reporting Program database for 2010 and 2015 (FBI 2010a, 2010b, 2015a, 2015b, 2015c, 2015d). Figure 3.11-8 illustrates violent crime rates per 100,000 inhabitants for San Francisco, San Mateo, and Santa Clara Counties and the state of California. Violent crime rates between 2010 and 2015 increased in San Francisco and San Mateo Counties and decreased in Santa Clara County and California. The highest rates of violent crime occurred in San Francisco County in both 2010 and 2015. Figure 3.11-9 shows property crime rates per

100,000 inhabitants for San Francisco, San Mateo, and Santa Clara Counties, and the state of California. Similar to the trends observed for violent crime, property crime rates between 2010 and 2015 increased in San Francisco and San Mateo Counties and decreased in Santa Clara County and California. The highest rates of property crime occurred in San Francisco County in both 2010 and 2015.



Sources: FBI 2010a, 2010b, 2015a, 2015b, 2015c, 2015d

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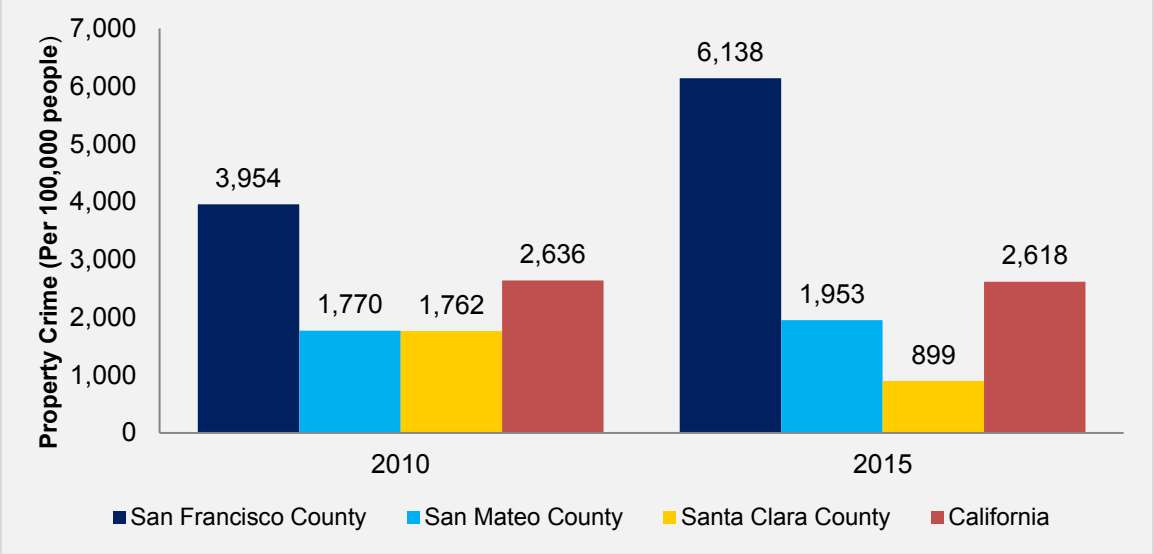
Figure 3.11-8 Violent Crime Rates Reported in San Francisco, San Mateo, and Santa Clara Counties and in California, 2010 and 2015



Sources: FBI 2010a, 2010b, 2015a, 2015b, 2015c, 2015d

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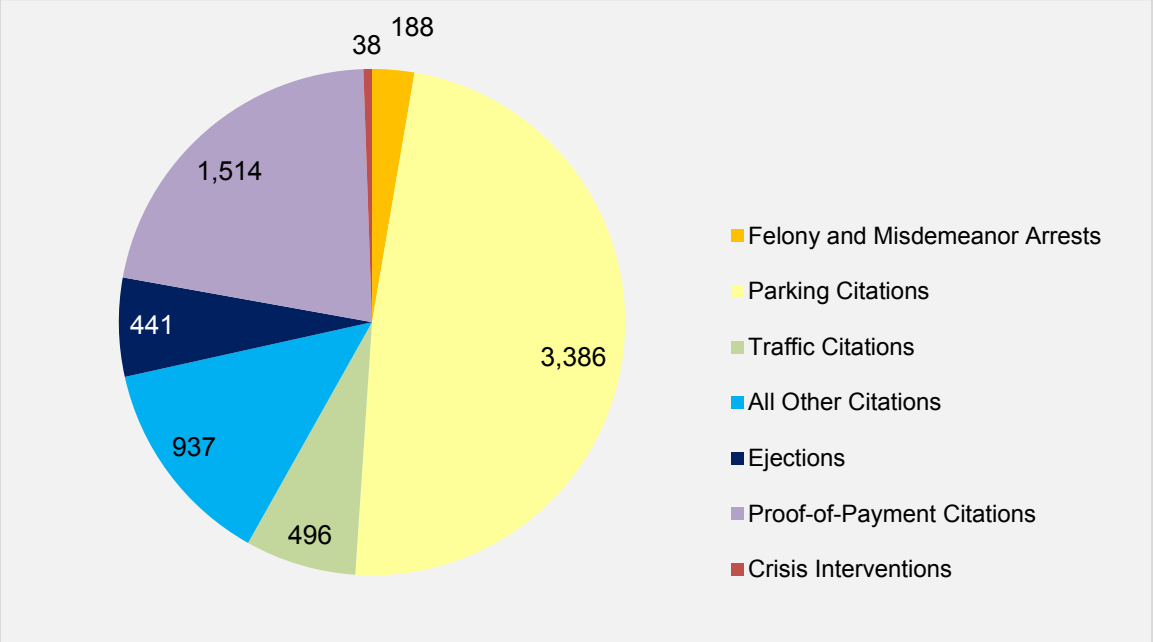
Figure 3.11-9 Property Crime Rates Reported in San Francisco, San Mateo, and Santa Clara Counties and in California, 2010 and 2015

An analysis of crime on passenger trains used statistics gathered from the Metro and BART transport authorities. These statistical sources were considered representative because Metro and BART operate passenger rail as transportation authorities. Reported crimes include those committed onboard trains and at transit facilities such as stations and parking lots. In 2015, a total of 20,873 Part 1 Offenses, as defined by the National Uniform Crime Reporting Program (i.e., criminal homicide, legacy/revised rape, robbery, aggravated assault, burglary, larceny theft, motor vehicle theft, and arson), occurred statewide in California, excluding heavy rail system agencies. In 2015, out of their combined 86,035,503 average weekly rail ridership (BART 2015; Metro n.d.), a total of 3,241 Part 1 Offenses occurred on the Metro and BART lines combined (FBI 2015c).

Additionally, the Authority reviewed monthly safety and security reports published by Caltrain in 2015 that summarize the frequency of various types of incidents involving law enforcement (Caltrain 2015). That year, Caltrain passengers placed 11,554 calls for police services. Figure 3.11-10 illustrates the transit police enforcement events by type. Approximately 55 percent of all enforcement events were a result of parking or traffic citations, 22 percent were proof-of-payment citations, and 13 percent were for other citations including trespassing. The remaining 10 percent of enforcement events consisted of felony arrests, ejections from stations and right-of-way, and crisis interventions with emergency commitments (Caltrain 2015).



Source: Caltrain 2015 FEBRUARY 2019

Figure 3.11-10 Caltrain Transit Police Enforcement Events by Type, 2015

3.11.5.4 Wildfire Hazards

Fire hazard models measure the likelihood of an area burning and how it burns (e.g., intensity, speed, embers produced), so it is possible to predict the likely damage by a fire (CAL FIRE 2012b). Fire hazard measurement includes the speed at which wildfire moves, the amount of heat the fire produces, and the burning firebrands (i.e., any burning wood that can start a fire) that the fire sends ahead of the flaming front. This information is identified as part of the fire hazard zoning performed by CAL FIRE. State responsibility area maps were adopted by CAL FIRE in 2007, and draft local responsibility area maps were published for San Francisco, San Mateo, and Santa Clara Counties in 2007 and 2008 (CAL FIRE 2007a, 2007b, 2007c, 2008a, 2008b). In 2016, CAL FIRE revised the *Strategic Fire Plan for California*, which provides the state's road

map for reducing the risk of wildfire (CAL FIRE 2016).[14] Part of this plan identifies and assesses community assets at risk for wildfire damage. CAL FIRE generated a list of California communities at risk for wildfire and created fire hazard severity zones (CAL FIRE 2007a, 2007b).[15]

The San Francisco Peninsula is highly developed and there are few locations in the counties where the project alternatives are situated that are classified as fire-hazard severity zones. In San Francisco County, a moderate fire hazard severity zone is at Bayview Park in southern San Francisco. In San Mateo County, there are moderate to high fire hazard severity zones near San Bruno Mountain. In Santa Clara County, there are no fire hazard severity zones in the RSA. While fire hazard severity zones exist in some counties in the San Francisco Peninsula, the project alternatives do not cross any of them.

3.11.6 Environmental Consequences

3.11.6.1 Overview

This section discusses the potential safety and security impacts of project construction and operations. Section 3.11.6.2, Emergency Services and Response, discusses potential impacts on emergency response time and emergency response access. Section 3.11.6.3, Community Safety and Security, discusses potential impacts related to construction worker safety, criminal and terrorist activity, traffic hazards, schools, aviation hazards, Valley fever, high-risk facilities, and operational safety. Each topic area discusses potential impacts from the No Project Alternative and the project alternatives. Each impact discussion considers the potential interference with emergency response times and services from construction and operations and the safety and security of construction workers, passengers, HSR employees, and the general public during construction and operations. The analysis also identifies the permanent beneficial impacts on motor vehicle, pedestrian, and bicycle safety that could result from implementing either project alternative. For this resource topic, there are no differences in the impacts for Alternative A with or without the DDV.

The Authority incorporated IAMFs into the design of the project that avoid or minimize impacts on emergency response and safety and security, as listed in Section 3.11.4.2, Impact Avoidance and Minimization Features, and Volume 2, Appendix 2-E. The IAMFs incorporate the design standards described in Volume 2, Appendix 2-D, and are a binding commitment by the Authority. These project features require the contractor to prepare a construction safety transportation management plan that establishes procedures for the contractor's coordination with local jurisdictions to maintain emergency vehicle access during construction and create an SSMP prior to initiating construction. During construction, the contractor will use best management practices and standard conditions for design and construction for methane detection systems, personnel training, and fugitive dust control measures. The contractor will also conduct a hazard analysis to identify and reduce any identified hazards. The contractor will identify and inspect all active and abandoned oil and natural gas wells prior to construction. In addition, the contractor will develop an SSP, including a safety and security certification program, fire and life safety plan, system security plan, and SEPP to address safety, security, and emergency response as they relate to the day-to-day operations of the HSR system. The system security plan will address HSR design features intended to maintain security at stations, within the trackwork right-of-way, and onboard trains.

[14] This plan was published in 2010 and revised in April 2016.

[15] The most recent fire hazard maps available are draft Local Responsibility Area maps published in 2008 and State Responsibility Area maps published in 2007.

To achieve safe operation of the blended system following construction and maintain community safety and security, the blended system has been designed for optimal performance in conformance with industry standards and federal and state safety regulations. The system design includes safety improvements at the at-grade highway-roadway crossings and will complete the perimeter fencing installed along portions of the Caltrain right-of-way. These improvements will minimize conflicts with vehicles, pedestrians, and bicyclists. Overall, this project would provide a safety benefit for travelers in the San Francisco Bay Area (Bay Area).

As part of the project design, the programmatic SSMP (Authority 2016) establishes the Authority's commitment and philosophy to achieve the highest practical level of safety and security throughout the California HSR System's life cycle. Through the risk-based system safety and security programs that identify, assess, avoid, and mitigate safety hazards and security vulnerabilities of the California HSR System, the risk of injury and property damage is minimized while the safety and security of HSR passengers, employees, and the public is maximized. The SSMP for the project will be based on the Authority's programmatic SSMP (Authority 2016).

3.11.6.2 Emergency Services and Response

Construction and operations of either project alternative could result in temporary and permanent changes to emergency vehicle access and response times in the RSA. Potential impacts could include temporary or permanent interference with emergency response access and temporary or permanent interference with emergency response times as a result of temporary or permanent road closures and realignments, increased demand for emergency services to respond to train accidents, and temporary or permanent interference with emergency response from criminal activity at construction sites, on trains, and at stations and the LMF.

No Project Impacts

The Bay Area population is expected to see continued growth through 2040 (Section 2.6.1.1, Projections Used in Planning). Development in the RSA to accommodate the population increase would continue under the No Project Alternative and would result in associated direct and indirect impacts on safety and security. The No Project Alternative considers the effects of conditions forecasted by current land use and transportation plans in San Francisco, San Mateo, and Santa Clara Counties, including planned improvements to the highway, aviation, conventional passenger rail, freight rail, and marine ports through the 2040 planning horizon. Planned and other reasonably foreseeable projects anticipated to be built by 2040 include shopping centers, industrial parks, transportation projects, and residential developments. Without the additional capacity provided by the project, the forecasted population and employment growth would increase pressure to expand highway and airport capacities. The Authority estimates that additional highway and airport projects (up to 4,300 highway lane miles, 115 airport gates, and 4 airport runways) would be needed to achieve equivalent capacity and relieve the increased pressure (Authority 2012b). Planned and other reasonably foreseeable projects anticipated to be built by 2040 could increase the demand for emergency services, affect emergency response times and emergency access, and result in the need for construction of new emergency response facilities. Counties and cities have financial mechanisms in place to meet service-level goals for emergency responders based on the projected population and employment growth in each city and county. A full list of anticipated future development projects is provided in Volume 2, Appendix 3.18-A, Cumulative Nontransportation Plans and Projects List, and Volume 2, Appendix 3.18-B, Cumulative Transportation Plans and Projects Lists.

Under the No Project Alternative, traffic volumes on regional roadways would continue to increase because of anticipated development activity through 2040, thereby affecting existing roadways, freeways, and intersections and resulting in increased delays and a degradation of LOS. Population in San Francisco, San Mateo, and Santa Clara Counties is projected to increase through 2029 and 2040. Development projects to accommodate projected population and employment growth would change transportation networks and traffic patterns, which could affect emergency response times and emergency access. Although programmed roadway and transportation improvements projects would increase roadway capacity, it is anticipated that the

additional capacity would not meet demand. Therefore, increased congestion and delays to emergency vehicles would occur under the No Project Alternative.

As described in Section 3.11.5, Affected Environment, past development has led to conditions affecting emergency services and community safety and security. Regional and local plans outline procedures for current and future community conditions, including fire, law enforcement, and emergency medical service operations during emergencies such as fires and other natural disasters, hazardous materials spills, transportation emergencies, civil disturbance, and terrorism. Section 3.11.5 discusses average law enforcement and fire department response times. Response times are not always consistent with the applicable goals and objectives outlined in regional and local planning documents. For example, the San Francisco, Brisbane, and Belmont Police Departments did not meet all of their response time standards or best practice standards for response times (as shown in Table 3.11-2).

Project Impacts

Construction Impacts

Building the project alternatives would include modifying and relocating existing tracks, stations, and platforms; modifying existing roadways and structures; building the Brisbane LMF and passing track (under Alternative B); installing four-quadrant gates at the at-grade crossings and perimeter fencing at the edge of the right-of-way; utility relocation; site preparation including demolition, excavation, and grading; and installing systems components. The amount of construction effort for the DDV would be approximately the same and would occur in the same locations as Alternative A without the DDV; therefore, there would be no difference in construction-period effects on safety and security for Alternative A with or without the DDV. The duration and intensity of construction activities would vary by location and project component. Minor track shifts within the existing Caltrain corridor would be performed by “on-track” equipment along the existing Caltrain tracks. Shifting the track alignment and ballast would be expected to last no more than several days at any given location. Installing four-quadrant gates at existing at-grade crossings would primarily occur over a period of 2 to 4 weeks when the intensity of construction activities would be greatest; however, 4 to 6 months of intermittent activities would be needed to complete installation. The construction of several major project components would, however, occur over several years—expanding the existing Millbrae Station would take 2 years; building the Brisbane LMF would take 2 to 3 years; and building the passing track under Alternative B would take 4.5 years. Section 2.10, Construction Plan, describes these construction activities in more detail.

Impact S&S#1: Temporary Impacts on Emergency Access and Response Times from Temporary Road Closures, Relocations, and Modifications

Construction activities associated with the modification of existing stations, construction of the Brisbane LMF, platform modifications, installation of four-quadrant gates at the at-grade crossings, and track modifications would involve underground utility work, changes in vehicle circulation, temporary closures of roadways or highways, lane closures, road relocations, reduced speed limits, detours, and congestion and delay along roadways and at intersections. Construction-related activities would lead to temporary increased travel time, delay, and limited access of emergency response vehicles because of changes in vehicle circulation and increased travel time. These activities would cause temporary delays in emergency vehicle access and response times. Construction activities would require temporary construction easements, which would result in the temporary closure of parking areas or roadway lanes.

Table 3.11-9 identifies the locations and anticipated durations of construction on roadways, which would result in temporary lane closures or periodic nighttime and weekend road closures. These temporary closures would increase travel time, cause delays, and limit access of emergency response vehicles. The greatest effects would occur under Alternative B during construction of the 6-mile-long passing track through San Mateo, Belmont, San Carlos, and Redwood City. The construction duration of the individual street undercrossing modifications of the passing track section under Alternative B would last 6 to 9 months each. However, lane closures and road

closures would generally be shorter in duration and would occur mostly at night wherever feasible. A construction transportation plan (CTP) will determine and minimize the exact locations of temporary closures, changes, and disruptions.

Table 3.11-9 Number and Location of Roadway Modifications with the Potential to Result in Temporary Lane Closures or Periodic Road Closures Affecting Emergency Response Time

Description of Activity	Number of Roadways and Locations	Alternative		Construction Duration[1]
		A	B	
San Francisco to South San Francisco Subsection				
Installation of four-quadrant gates	3—Mission Bay and 16th Street (San Francisco); Linden Avenue (South San Francisco)	X	X	2–4 weeks[2]
Bayshore Caltrain Station Modifications	1—Street A within the Schlage Lock project (San Francisco)	X	X	1-2 weeks (minor lane closures)
Road realignment to accommodate East Brisbane LMF	1—Tunnel Avenue (Brisbane)	X		1–3 months (no closure with proposed construction staging)
Realignment of the grade separation	1—Tunnel Avenue overpass (Brisbane)	X	X	Up to 2 years (no closure with proposed construction staging)
Road extension	1—Lagoon Road (Brisbane)	X	X	1–3 months (no closure with proposed construction staging)
San Bruno to San Mateo Subsection				
Installation of four-quadrant gates	16—Scott Street (San Bruno); Center Street (Millbrae); Broadway, Oak Grove Avenue, North Lane, Howard Avenue, Bayswater Avenue, and Peninsula Avenue (Burlingame); Villa Terrace, Bellevue Avenue, 1st Avenue, 2nd Avenue, 3rd Avenue, 4th Avenue, 5th Avenue, and 9th Avenue (San Mateo)	X	X	2–4 weeks[2]
Widening of existing underpass	1—Hillcrest Boulevard (Millbrae)	X	X	6–9 months
San Mateo to Palo Alto Subsection				
Installation of four-quadrant gates	15—Whipple Avenue, Brewster Avenue, Broadway, Maple Street, Main Street, Chestnut Street (Redwood City); Watkins Avenue (Atherton); Encinal Avenue, Glenwood Avenue, Oak Grove Avenue, Ravenswood Avenue (Menlo Park); Alma Street, Churchill Avenue, Meadow Drive, and Charleston Road (Palo Alto)	X	X	2–4 weeks[2]

Description of Activity	Number of Roadways and Locations	Alternative		Construction Duration[1]
		A	B	
Extension of existing underpasses	7—25th Avenue, 28th Avenue, 31st Avenue, 42nd Avenue (San Mateo); Harbor Boulevard (Belmont); Brittan Avenue (San Carlos); Howard Avenue (San Carlos)		X	6–9 months
Replacement of existing underpasses	2—Ralston Avenue (Belmont); Holly Street (San Carlos)		X	6–9 months
Mountain View to Santa Clara Subsection				
Installation of four-quadrant gates	4—Rengstorff and Castro Street (Mountain View); Mary Avenue and Sunnyvale Avenue (Sunnyvale)	X	X	2–4 weeks[2]
San Jose Diridon Station Approach Subsection				
Replacement of overcrossing with an undercrossing	De la Cruz Boulevard (Santa Clara)		X[4]	1 year
New rail overcrossing	I-880 (San Jose)		X[4]	6 months
Replacement of overcrossing	West Hedding Street (San Jose)		X[3]	1 year
Replacement of overcrossing with an undercrossing	West Hedding Street (San Jose)		X[4]	1 year
Road realignment	Chestnut Street (San Jose)		X[3,4]	1–3 months
New rail overcrossing	West Taylor Street (San Jose)	X		6 months
New rail overcrossing and reconstruction of undercrossing	West Taylor Street (San Jose)		X[3]	1 year
Road realignment	West Taylor Street (San Jose)		X[4]	1–3 months
Road extension	4—North Montgomery Street, Stover Street, Crandall Street, Cahill Street (San Jose)		X[3,4]	3 months
New rail overcrossing	I-280	X		2 years
New rail overcrossing	I-280/SR 87 Interchange		X[3,4]	2 years
Realignment	SR 87 On-Ramp		X[3,4]	6–12 months
Installation of four-quadrant gates	2—Auzerais Avenue and West Virginia Avenue (San Jose)	X		2–4 weeks[2]
New rail overcrossing and reconstruction of undercrossing	2—Bird Avenue and Delmas Avenue (San Jose)	X		6–12 months
New rail overcrossing	Prevost Street	X		6–12 months
Realignment	Fuller Avenue	X		1 year

Description of Activity	Number of Roadways and Locations	Alternative		Construction Duration[1]
		A	B	
New rail overcrossing	SR 87	X		2 years
New rail overcrossing	Willow Street	X		6–12 months

I- = Interstate
LMF = light maintenance facility
SR = State Route
[1] The actual duration of lane closures or road closures would be less than the construction durations.
[2] The greatest construction activity within roadway rights-of-way would occur over 2 to 4 weeks, while less intense, intermittent activities would take 4 to 6 months to complete installation of the four-quadrant gates.
[3] Alternative B (Viaduct to I-880)
[4] Alternative B (Viaduct to Scott Boulevard)

Construction of the East Brisbane LMF under Alternative A would require realignment of Tunnel Avenue to the east to allow construction of the LMF. Construction of either the East or West Brisbane LMF would require realignment of the Tunnel Avenue overpass and extension of Lagoon Road in Brisbane. A feasible approach to phased construction of the realigned Tunnel Avenue overpass has been identified that would maintain access to Tunnel Avenue from Bayshore Boulevard throughout the construction process. Construction of the new Tunnel Avenue overpass under both project alternatives would occur prior to removing the existing Tunnel Avenue overpass from operation, eliminating the need for a temporary road closure. For Alternative A, the sequence of relocating the Tunnel Avenue overpass and realigning Tunnel Avenue and Lagoon Road is illustrated on Figures 3.11-11 through 3.11-13. For Alternative B, the sequence is illustrated on Figures 3.11-14 through 3.11-16.

The following summarizes the sequence of access to Tunnel Avenue and Lagoon Road during construction under Alternative A:

- During Stage 1, access would be maintained as-is during construction of the relocated Tunnel Avenue overpass structure and approach embankments and the construction of the realigned Lagoon Road (Figure 3.11-11).
- During Stage 2, construction of the relocated Tunnel Avenue overpass and the Tunnel Avenue/Bayshore Boulevard intersection would be completed, and traffic would be routed to the relocated Tunnel Avenue overpass. At this point, construction of the Relocated Brisbane Fire Station (Alternative A) could commence, and the existing Tunnel Avenue overpass could be removed, except for the two structure bents that are over the existing Brisbane Fire Station's secondary access roadway. The secondary access would continue to be used until the Relocated Brisbane Fire Station (Alternative A) is operational, at which point the existing Brisbane Fire Station and remaining portions of the existing Tunnel Avenue overpass would be removed (Figure 3.11-12).
- Once construction of Lagoon Road realignment is complete, traffic would be routed to the realigned Lagoon Road (Figure 3.11-13).

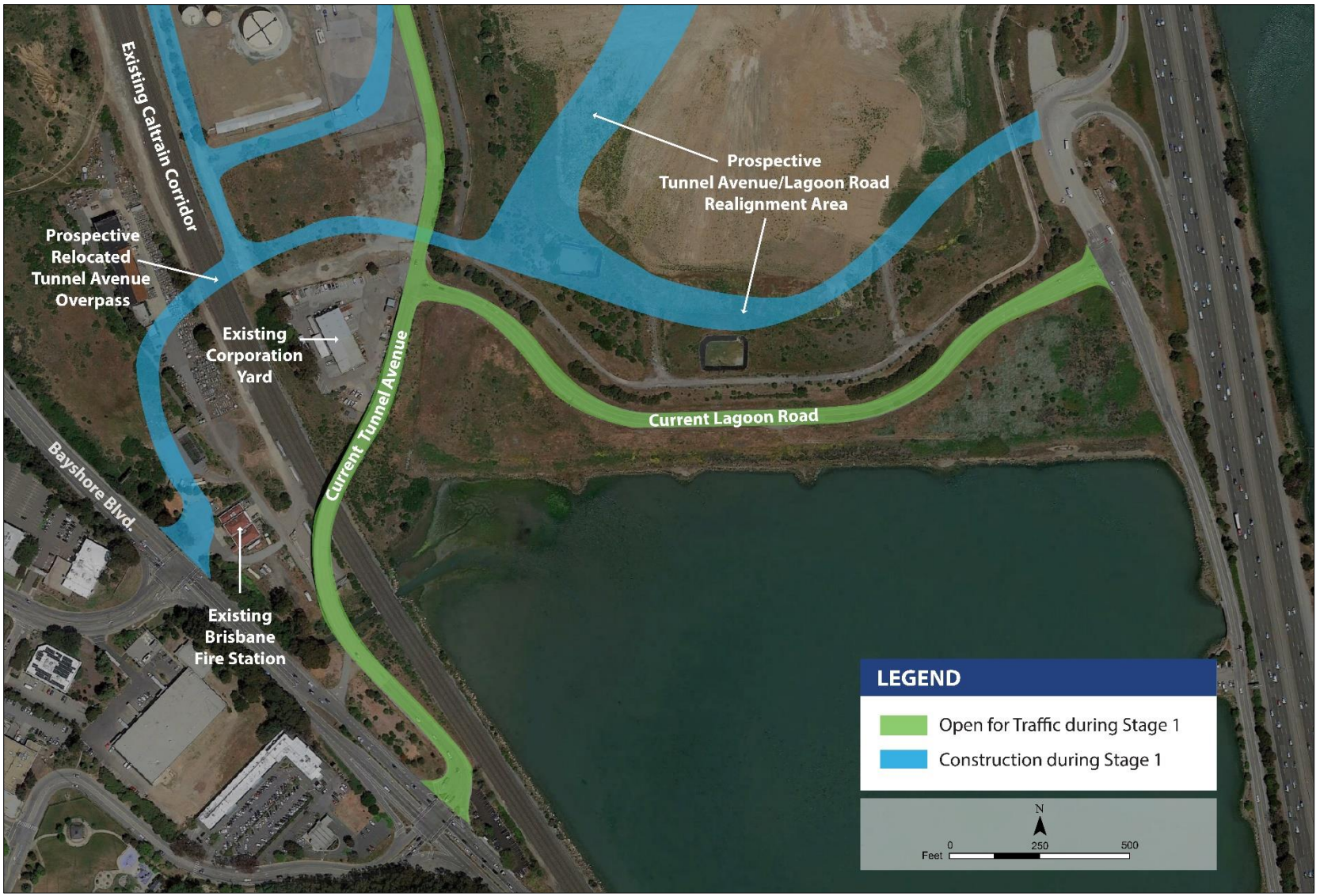


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Figure 3.11-11 Conceptual Construction Stage 1 for Tunnel Road/Lagoon Road Realignment, Alternative A

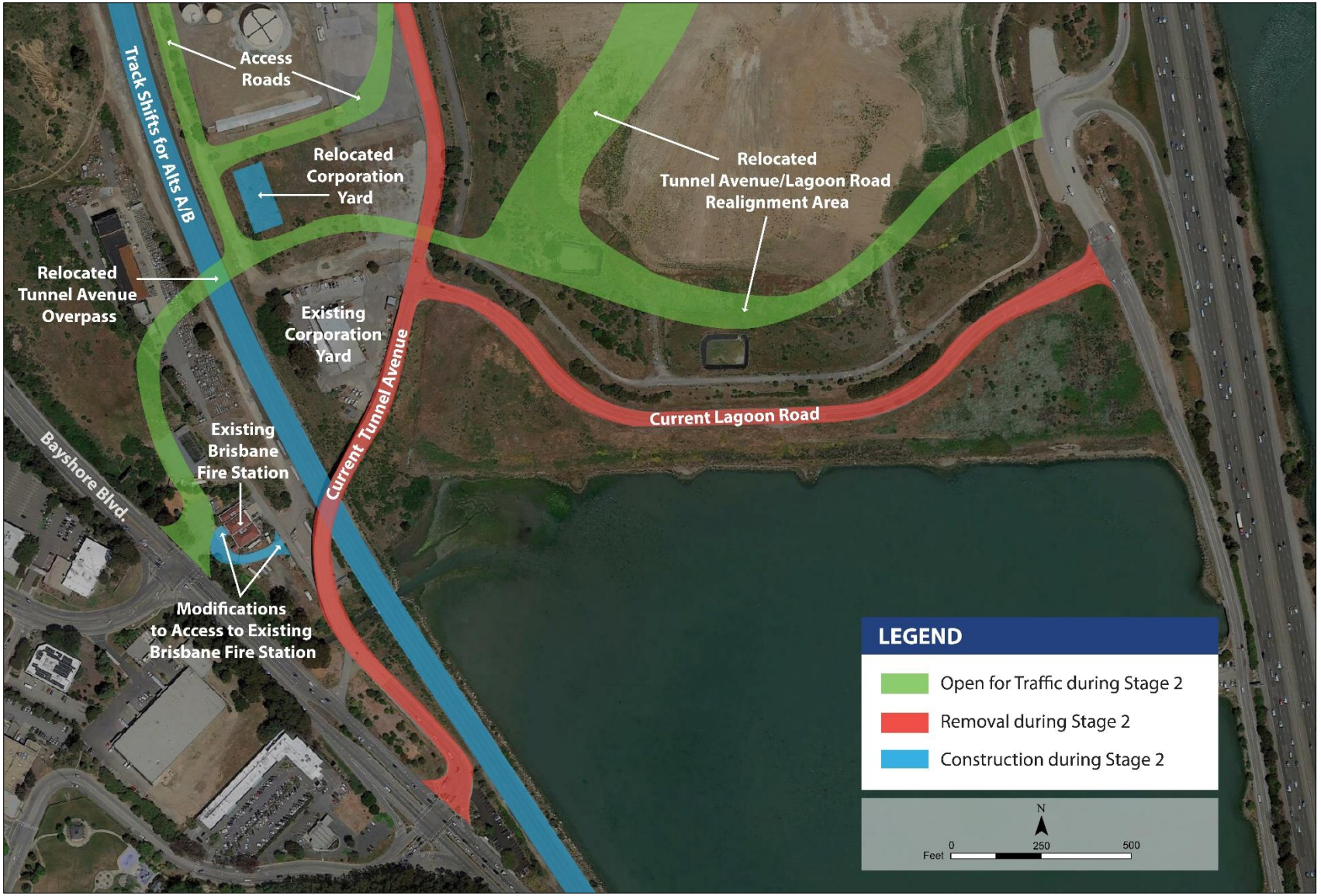

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Figure 3.11-12 Conceptual Construction Stage 2 for Tunnel Road/Lagoon Road Realignment, Alternative A

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Figure 3.11-13 Conceptual Construction Stage 3 for Tunnel Road/Lagoon Road Realignment, Alternative A

The following summarizes the sequence of access during construction for the existing Brisbane Fire Station and then Relocated Brisbane Fire Station (Alternative A):

- During the first stage of construction, a relocated Tunnel Avenue would be built north of the existing Brisbane Fire Station with a new temporary signalized intersection at Bayshore Boulevard several hundred feet north of the existing Brisbane Fire Station access at the Bayshore Boulevard/Valley Drive intersection. During this initial stage of construction, the existing Brisbane Fire Station would remain in its current location and access to the street network from the station would be unchanged (Stage 1, Figure 3.11-11).
- During construction of the relocated Tunnel Avenue intersection with Bayshore Boulevard, access to the existing Brisbane Fire Station would be maintained via the existing secondary access from the rear of the station. Temporary circulation from the front of the existing Brisbane Fire Station to the secondary access would also be maintained by means of improvements to the existing driveway on the south side of the station (Stages 1 and 2, Figures 3.11-11 and 3.11-12)
- Once the relocated Tunnel Avenue overpass is complete with the interim connection to Bayshore Boulevard, fire station vehicles would access Tunnel Avenue via the new temporary signalized intersection several hundred feet north of the existing Brisbane Fire Station access at Bayshore Boulevard/Valley Drive. The Relocated Brisbane Fire Station (Alternative A) would then be constructed (Stages 2 and 3, Figures 3.11-12 and 3.11-13).
- During the final stage of construction, demolition of the existing Brisbane Fire Station would occur, followed by construction of the ultimate connection of the relocated Tunnel Avenue overpass to the east leg of the Bayshore Boulevard/Valley Drive intersection. During this last stage of construction, the Relocated Brisbane Fire Station (Alternative A) would be operational and access to the local street network would be similar to the access for the existing Brisbane Fire Station, as it would occur at a signalized intersection on Bayshore Boulevard approximately 800 feet south of the existing Brisbane Fire Station access, with exclusive use of the east leg of the intersection (Stage 3, Figure 3.11-13).

Based on the above construction staging, emergency vehicle access to the local street network from the Brisbane Fire Station would be uninterrupted during construction.

For Alternative B, emergency vehicle access to the local street network from the Relocated Brisbane Fire Station (Alternative B) would initially be maintained at the existing signalized intersection of Bayshore Boulevard/Valley Drive (Figure 3.11-14). Ultimately, as shown in Figure 3.11-16, such access would be shifted to a primary access via a new driveway on the relocated Tunnel Avenue, on the east leg of the signalized intersection of Bayshore Boulevard/Valley Drive/Relocated Tunnel Avenue intersection, as well as a secondary access at the existing mid-block driveway on Bayshore Boulevard between Valley Drive and Old County Road (right-in, right-out access).

The Relocated Brisbane Fire Station (Alternative B) would be constructed immediately south of the existing Brisbane Fire Station. Construction staging for the area around the fire station would be similar under Alternative B to the staging described for Alternative A. However, construction of the Relocated Brisbane Fire Station (Alternative B) is not dependent on switching traffic to the relocated Tunnel Avenue overpass, and could commence in advance, including provision of the new secondary access from Bayshore Avenue. Full operation of the existing Brisbane Fire Station would be maintained as-is during construction of the relocated Tunnel Avenue overpass structure and approach embankment. Once construction of the Relocated Brisbane Fire Station (Alternative B) is complete, access would be provided from the new secondary access and the existing Brisbane Fire Station would be removed, allowing construction of the relocated Tunnel Avenue intersection with Bayshore Boulevard and the primary access for the Relocated Brisbane Fire Station (Alternative B) onto Tunnel Avenue. At this point, traffic would be routed to the relocated Tunnel Avenue overpass, the Relocated Brisbane Fire Station (Alternative B) would be fully operational, and the existing Tunnel Avenue overpass could be removed.

The following summarizes the sequence of access during construction for the existing Brisbane Fire Station and then Relocated Brisbane Fire Station (Alternative B):

- During Stage 1, when the Tunnel Avenue overpass would be relocated to the north of the existing Brisbane Fire Station with a new temporary signalized intersection at Bayshore Boulevard several hundred feet north of the existing station access at Bayshore Boulevard/Valley Drive, the existing Brisbane Fire Station would remain and access to the street network would be unchanged (Figure 3.11-14).
- In Stage 2, construction of the Relocated Brisbane Fire Station (Alternative B) immediately south of the existing station would proceed. The existing Brisbane Fire Station and access would be retained during construction of the Relocated Brisbane Fire Station (Alternative B) (Figure 3.11-15).
- During Stage 2, demolition of the existing Brisbane Fire Station would occur followed by construction of the ultimate connection of the relocated Tunnel Avenue overpass alignment to the east leg of the Bayshore Boulevard/Valley Drive intersection (Figure 3.11-15).
- In Stage 3, the Relocated Brisbane Fire Station (Alternative B) would be operational and the primary access to Tunnel Avenue would occur via a temporary connection to the east leg of the signalized intersection of Bayshore Boulevard/Valley Drive intersection (Figure 3.11-16).

During construction of the ultimate connection of the relocated Tunnel Avenue overpass alignment to the east leg of the Bayshore Boulevard/Valley Drive intersection and a new fire station driveway, access to the Relocated Brisbane Fire Station (Alternative B) via the primary access to Bayshore Boulevard may be closed for a short period of time while the final segment of the relocated Tunnel Avenue is constructed. During any temporary access closures, access to the Relocated Brisbane Fire Station (Alternative B) would occur via the secondary access at the existing mid-block driveway on Bayshore Boulevard between Valley Drive and Old County Road (right-in, right-out access).

Once the last stage of construction is complete, vehicles from the Relocated Brisbane Fire Station (Alternative B) would access the relocated Tunnel Avenue via the primary access driveway onto the relocated Tunnel Avenue. The right turn from the Relocated Brisbane Fire Station (Alternative B) driveway onto northbound Tunnel Avenue would provide more direct access along Tunnel Avenue to the north than the existing Brisbane Fire Station access, where fire station vehicles must turn left onto Bayshore Boulevard, travel about 800 feet and turn left onto the existing Tunnel Avenue overcrossing. Access of fire station vehicles to Bayshore Boulevard with the Relocated Brisbane Fire Station (Alternative B) would be less direct than with the existing Brisbane Fire Station.

The Authority incorporated project features that avoid and minimize project impacts. Prior to construction, the Authority's contractor will prepare a construction safety transportation management plan that describes the contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access during construction (SS-IAMF#1). The plan will also specify the contractor's procedures for temporary road closures, including access to residences and businesses during construction, lane closures, signage, detour provisions, emergency vehicle access, and alternative access locations. Monthly reports to the Authority will be prepared and submitted by the contractor documenting these activities for compliance monitoring. In addition, the CTP will identify when and where temporary closures and detours will occur, with the goal of maintaining traffic flow, especially during peak travel periods (TR-IAMF#2). The CTP will be coordinated with local jurisdictions and reviewed and approved by the Authority. It will include a traffic control plan that establishes procedures for temporary road closures, including maintaining access to residences and businesses during construction, procedures for lane closure, signage and flag persons, temporary detour provisions, alternative bus and delivery routes, and maintenance of pedestrian access. The contractor will prepare and submit monthly reports to the Authority documenting these activities for compliance monitoring.

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Figure 3.11-14 Conceptual Construction Stage 1 for Tunnel Road/Lagoon Road Realignment, Alternative B

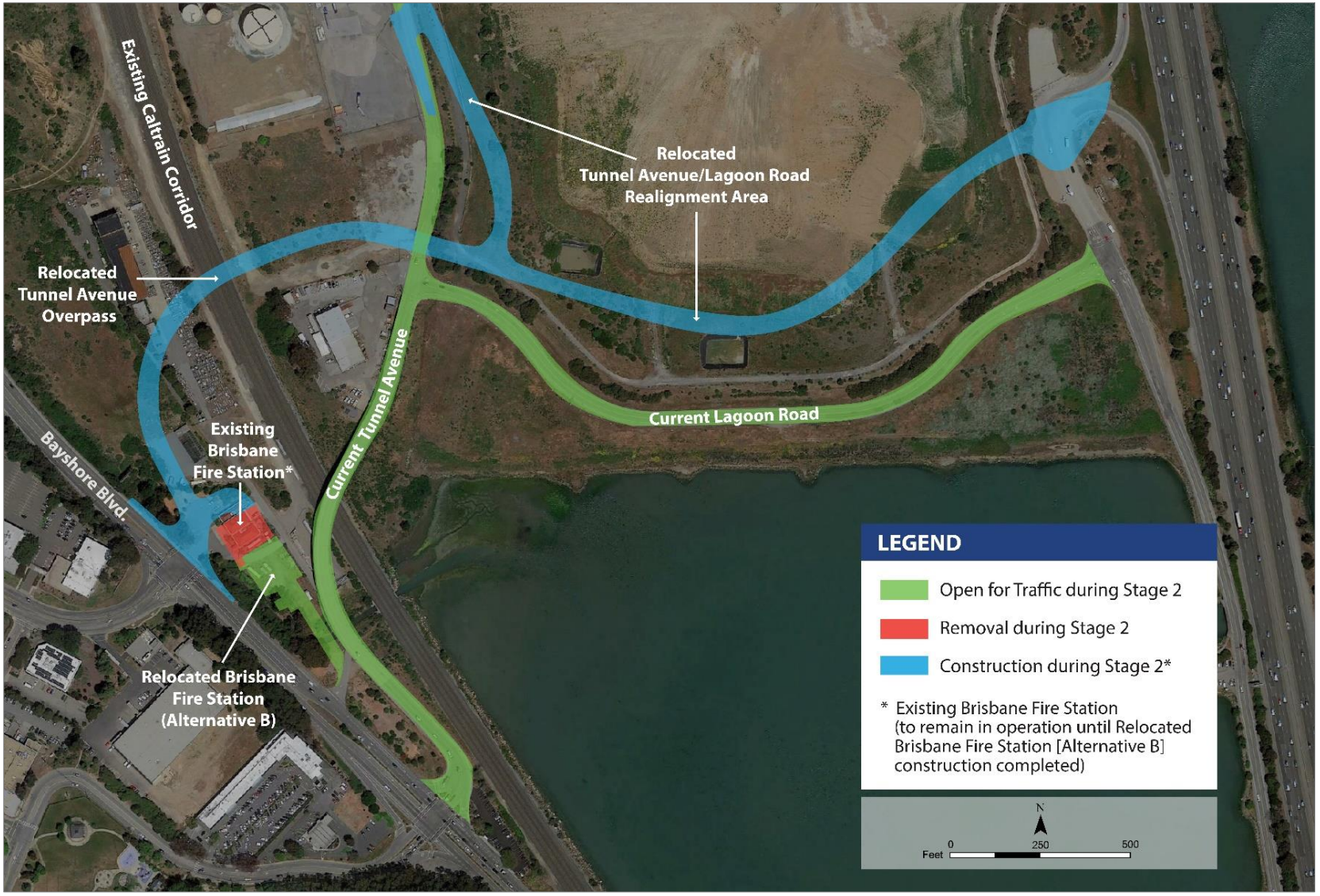

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Figure 3.11-15 Conceptual Construction Stage 2 for Tunnel Road/Lagoon Road Realignment, Alternative B

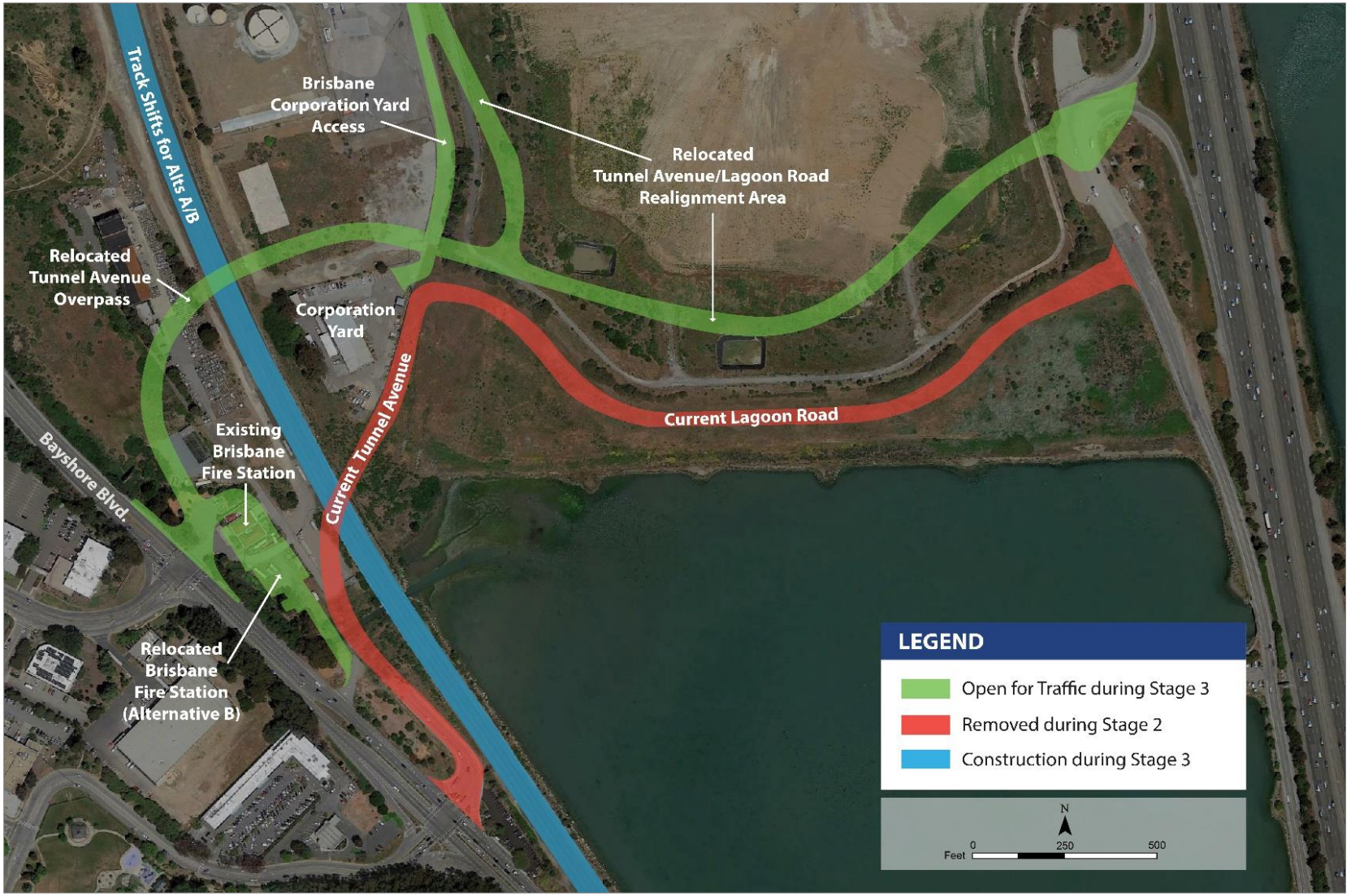

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Figure 3.11-16 Conceptual Construction Stage 3 for Tunnel Road/Lagoon Road Realignment, Alternative B

CEQA Conclusion

The impact would be less than significant under CEQA for Alternative A because construction would not result in inadequate emergency access. Temporary road closures would be limited in extent and duration and emergency response delays would be minimized through coordination with local jurisdictions and procedures for implementing or maintaining emergency vehicle access during construction.

The impact would be significant under CEQA for Alternative B because temporary road closures associated with the passing track under Alternative B would result in longer travel paths that could delay emergency vehicle response times. Project features minimize increases in emergency response delays through coordination with local jurisdictions and procedures for implementing or maintaining emergency vehicle access during construction, but significant impacts would still occur. A mitigation measure to address this impact under Alternative B is identified in Section 3.11.9. Section 3.11.7 describes the measure in detail.

Impact S&S#2: Temporary Impacts on Emergency Access and Response Times from Construction Vehicles

Construction vehicle traffic would be generated by modifications to existing stations, construction of the Brisbane LMF, construction of the viaduct (Alternative B), platform modifications, installation of four-quadrant gates at the at-grade crossings, track modifications, and other construction activities for the alternatives. Construction vehicle traffic would also result from construction of the passing track and associated structure modifications under Alternative B. Construction traffic would include heavy truck traffic into and out of the construction sites to deliver materials and transport demolished or excavated materials, and movement of heavy construction equipment onto the construction site. Use of heavy equipment and trucks would have the potential to disrupt traffic, especially during morning or evening peak traffic periods. Construction worker vehicles entering and leaving the construction sites at the beginning and end of shifts could also increase delays on roadways and at intersections.

Project features avoid and minimize impacts on emergency access and response times (SS-IAMF#1, TR-IAMF#2). In addition, all project-related truck traffic, either for excavation or for transporting construction materials to the site, will use the designated truck routes in each city (TR-IAMF#7) to the extent possible. As part of the CTP, truck routes will be established away from schools, childcare facilities, and residences, or along the routes with the least impact on operations. A detailed construction access plan will be developed for the project prior to beginning any construction activities. The construction access plan will be reviewed by local city, county, and transit agencies. The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the site will generally occur during off-peak hours on designated truck routes. Once on-site, heavy construction equipment will remain there until its use for that job is completed, preventing equipment from being moved repeatedly to and from the construction site over public streets. Trips for construction workers will generally occur outside peak hours for roadway and freeway traffic. The contractor will limit the number of construction employees arriving or departing the site between the hours of 7 a.m. and 8:30 a.m. and 4:30 p.m. and 6 p.m. (TR-IAMF#6). The contractor will also limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to reduce traffic conflicts generated by construction traffic. The project may involve the use of remote parking areas for these workers, with shuttles to bring them to and from the construction area if the remote parking areas are distant from the construction site (TR-IAMF#3). The contractor will prepare and submit monthly reports to the Authority documenting these activities for compliance monitoring.

CEQA Conclusion

The impact under CEQA would be less than significant for both project alternatives because temporary construction vehicle operations would generally not interfere with local vehicle circulation or cause delays or reductions in LOS, operations hazards, or loss of access to residences or community facilities that would result in inadequate emergency access. Project features effectively control and manage construction vehicle traffic through construction plans, standard construction practices, designated construction truck routes, and restrictions on construction hours. Therefore, CEQA does not require mitigation.

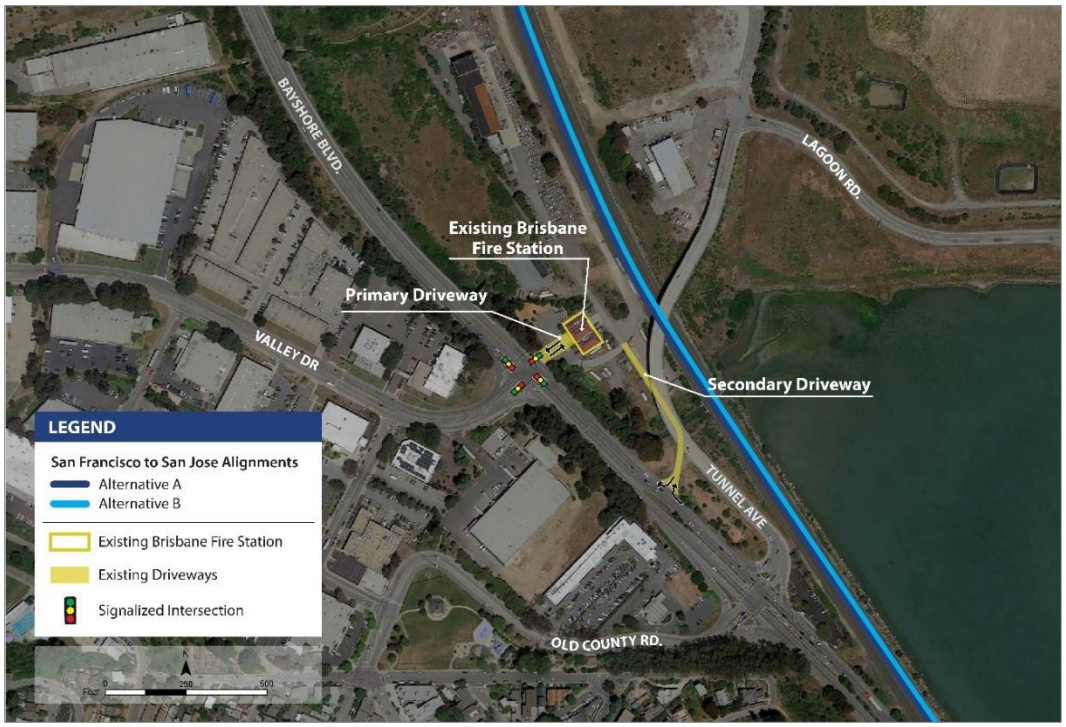
Impact S&S#3: Permanent Impacts on Emergency Access and Response Times Caused by Construction

Building the project alternatives would require few permanent road closures and relocations. The only permanent road closure under Alternative A would occur at Serra Avenue, a short local street between El Camino Real and the Millbrae Station in Millbrae. Serra Avenue also would be closed under Alternative B. Serra Avenue would be replaced by an extension of California Drive from Linden Avenue to Victoria Avenue. As such, the Serra Avenue closure would have no permanent impact on vehicle circulation or emergency access and response times.

A section of Chestnut Street in San Jose would be closed under Alternative B (Viaduct to I-880). For Alternative B (Viaduct to I-880), Chestnut Street in San Jose would be realigned and closed between Asbury Street and West Taylor Street; traffic would be able to use Asbury Street to access Coleman Avenue and Taylor Street and thus the closure of one block would not substantially affect vehicle circulation or emergency access and response times. For Alternative B (Viaduct to Scott Boulevard), Chestnut Street would be realigned, but not closed. In addition, under Alternative B (both viaduct options), Stockton Street, University Avenue, and Emory Street (all of which end at the Caltrain right-of-way) would be shortened north of the Caltrain right-of-way and converted to cul-de-sacs to accommodate the viaduct. Because these roads are not through roads across the Caltrain right-of-way, their shortening would have no substantial permanent impact on vehicle circulation or emergency access and response times.

Construction of either the East Brisbane LMF under Alternative A or the West Brisbane LMF under Alternative B would require relocation of the Tunnel Avenue overpass and realignment of Lagoon Road. The relocation of the Tunnel Avenue overpass would include relocating the southern terminus of Tunnel Avenue from the intersection of Bayshore Boulevard/Old County Road to Bayshore Boulevard/Valley Drive, which is the primary vehicle access to and from the Brisbane Fire Station, at 3445 Bayshore Boulevard. The existing fire station has a primary driveway with exclusive access to and from the east leg of the signalized Bayshore Boulevard/Valley Drive intersection as well as a secondary driveway in a mid-block location with right-in, right-out access to northbound Bayshore Boulevard (Figure 3.11-17).

Under Alternative A, the Brisbane Fire Station would be relocated approximately 800 feet to the south of the existing fire station, with two driveways connecting to Bayshore Boulevard. The southerly driveway for the relocated fire station would connect to the east leg of the signalized Bayshore Boulevard/Old County Road intersection (Figure 3.11-18), providing full access to Bayshore Boulevard equivalent to the existing level of access provided at the signalized Bayshore Boulevard/Valley Drive intersection. A second northerly driveway would connect to Bayshore Boulevard at the existing station's secondary driveway located approximately 400 feet north of Old County Road. This secondary driveway is a mid-block location that provides right-in, right-out access to northbound Bayshore Boulevard.



AUGUST 2021

Figure 3.11-17 Existing Roadway Configuration for Brisbane Fire Station

AUGUST 2021

Figure 3.11-18 Proposed Roadway Configuration and Brisbane Fire Station Relocation under Alternative A

After construction, access at the Relocated Brisbane Fire Station (Alternative A) would be similar to access at the existing fire station during operations, with some changes, as discussed below:

- Once the last stage of construction is complete, vehicles from the Relocated Brisbane Fire Station (Alternative A) would access the relocated Tunnel Avenue via the east leg of the Bayshore Boulevard/Valley Drive/Tunnel Avenue intersection. The distance traveled by fire station vehicles along Bayshore Boulevard from the Relocated Brisbane Fire Station (Alternative A) to access the relocated Tunnel Avenue overpass would be approximately the same as the current distance traveled by fire station vehicles from the existing Brisbane Fire Station to the existing Tunnel Avenue overpass.
- The travel distance to Bayshore Boulevard from the Relocated Brisbane Fire Station (Alternative A) would be 10 feet shorter than in the existing condition; however, a 90-degree turn is required to approach the intersection. Returning fire trucks would either use the secondary access north of the station and pull through into the station bays or use the primary access and back into the station bays using the designated parking area[16] to maneuver. Backing into the Relocated Brisbane Fire Station (Alternative A) would not be required, but if done, could occur from within the fire station property (the parking lot) and not from a public street.
- The minimum width of the emergency services right-of-way would be approximately 110 feet and would accommodate visitor parking and an area for training and outdoor space. The new station would be functional within the footprint provided.
- The relocation of the Brisbane Fire Station and connection to Bayshore Boulevard by two driveways would provide full access to Bayshore Boulevard that is equivalent to the existing level of access provided.

The Relocated Brisbane Fire Station (Alternative B) would be approximately 150 feet south of the existing fire station, with access via the new Tunnel Avenue/Bayshore Boulevard intersection, which would allow turns to both northbound and southbound Bayshore Boulevard. A secondary driveway would connect the Relocated Brisbane Fire Station (Alternative B) to Bayshore Boulevard via the existing station's secondary driveway (Figure 3.11-19). This driveway is a mid-block location that provides right-in, right-out access to northbound Bayshore Boulevard; fire trucks exiting the secondary driveway of the Relocated Brisbane Fire Station (Alternative B) would only be able to turn northbound onto Bayshore Boulevard from the mid-block location.

With Alternative B, the permanent relocation and realignment of the Tunnel Avenue overpass would remove the existing Brisbane Fire Station's direct and exclusive access to the signalized Bayshore Boulevard/Valley Drive intersection and would replace it with an unsignalized driveway access and the non-exclusive use of the new Tunnel Avenue/Bayshore Boulevard signalized intersection. The loss of exclusive access to a signalized intersection with Bayshore Boulevard would result in additional delay for exiting fire trucks and delays in emergency access and response times for trucks exiting the Relocated Brisbane Fire Station (Alternative B).

Under both project alternatives, Lagoon Road in Brisbane would be realigned from its existing westerly terminus at Tunnel Avenue to connect to the relocated Tunnel Avenue overpass. The Lagoon Road realignment would have no permanent impact on vehicle circulation or emergency access and response times under either Alternative A or Alternative B.

[16] The existing park-and-ride lot located at the intersection of the Tunnel Avenue and Old County Road would be repurposed for visitor parking for the Relocated Brisbane Fire Station (Alternative A).

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Figure 3.11-19 Proposed Roadway Configuration and Brisbane Fire Station Relocation under Alternative B

CEQA Conclusion

The impact under Alternative A would be less than significant because the Relocated Brisbane Fire Station (Alternative A) and connection to Bayshore Boulevard by two driveways would provide full access to Bayshore Boulevard that is equivalent to the existing level of access provided, and thus the relocation would not add delays to fire trucks entering or exiting the station and would not affect service ratios, response times, or other performance objectives. Therefore, under Alternative A, CEQA does not require any mitigation.

The emergency response impact of the Relocated Brisbane Fire Station (Alternative B) would be significant under CEQA because the permanent relocation and realignment of the Tunnel Avenue overpass would remove the existing Brisbane Fire Station's direct and exclusive access to the signalized Bayshore Boulevard/Valley Drive intersection and would replace it with an unsignalized driveway access and the non-exclusive use of the new Tunnel Avenue/Bayshore Boulevard signalized intersection. The loss of exclusive access to a signalized intersection with Bayshore Boulevard would result in additional delay for exiting fire trucks and delays in emergency access and response times for trucks exiting the Relocated Brisbane Fire Station (Alternative B). A mitigation measure to address this impact is identified in Section 3.11.9. Section 3.11.7 describes the measure in detail.

Operations Impacts

Project operations would involve scheduled blended HSR and Caltrain train travel along the existing rail corridor through the Bay Area, as well as inspection and maintenance along the track and railroad right-of-way and inspection and maintenance of trainsets at the Brisbane LMF.

Section 2.8, Operations and Service Plan, describes operations and maintenance (O&M) activities in greater detail.

Impact S&S#4: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities

Project operations would increase the number, frequency, and speeds of trainsets operating within the Caltrain corridor, while reducing the distance between trains. Project operations between San Francisco and San Jose would occur in a partially grade-separated system that has 41 at-grade roadway crossings (see Table 3.11-10), which would result in potential conflicts between trains and motor vehicles, pedestrians, and cyclists. The potential for incidents to occur at the at-grade crossings during project operations would be reduced through installation of four-quadrant gates, barriers, and roadway channelization at the crossings where these improvements do not already exist. These gates would prevent drivers from traveling in opposing lanes to avoid the lowered gate arms. Pedestrian and bicycle crossing gates also would be built parallel to the tracks and aligned with the vehicular gates on either side of the roadway. The project alternatives would install four-quadrant gates, barriers, and roadway channelization at 40 at-grade crossings under Alternative A and at 38 at-grade crossings under Alternative B, the types and locations of which are identified in Table 3.11-10. Refer to Section 2.4.5.1, At-Grade Crossing Improvements, for illustrations of the six different four-quadrant gate applications that would be installed at the at-grade crossings.

Table 3.11-10 Proposed Improvements to At-Grade Crossings in the Project Section

No.	Jurisdiction	At-Grade Crossing	Proposed Improvement[1]
San Francisco to South San Francisco Subsection (Alternative A and Alternative B)			
1	San Francisco	Mission Bay Drive	Application A
2	San Francisco	16th Street	Application A
San Bruno to San Mateo Subsection (Alternative A and Alternative B)			
3	South San Francisco	Linden Avenue	Application D
4	San Bruno	Scott Street	Application B1
5	Millbrae	Center Street	Application B
6	Burlingame	Broadway	Application C
7	Burlingame	Oak Grove Avenue	Application B
8	Burlingame	North Lane	Application B
9	Burlingame	Howard Avenue	Application B
10	Burlingame	Bayswater Avenue	Application B
11	Burlingame	Peninsula Avenue	Application B
12	San Mateo	Villa Terrace	Application B
13	San Mateo	Bellevue Avenue	Application B
14	San Mateo	1st Avenue	Application E
15	San Mateo	2nd Avenue	Application E
16	San Mateo	3rd Avenue	Application E
17	San Mateo	4th Avenue	Application A
18	San Mateo	5th Avenue	Application A
19	San Mateo	9th Avenue	Application E

No.	Jurisdiction	At-Grade Crossing	Proposed Improvement[1]
San Mateo to Palo Alto Subsection (Alternative A and Alternative B)			
20	Redwood City	Whipple Avenue	Application C
21	Redwood City	Brewster Avenue	Application D
22	Redwood City	Broadway	Application D
23	Redwood City	Maple Street	Application E
24	Redwood City	Main Street	Application E
25	Redwood City	Chestnut Street	Application B
26	Atherton	Fair Oaks Lane	None[2]
27	Atherton	Watkins Avenue	Application B1
28	Menlo Park	Encinal Avenue	Application B
29	Menlo Park	Glenwood Avenue	Application E
30	Menlo Park	Oak Grove Avenue	Application A
31	Menlo Park	Ravenswood Avenue	Application A
32	Palo Alto	Alma Street	Application B
33	Palo Alto	Churchill Avenue	Application D
34	Palo Alto	Meadow Drive	Application D
35	Palo Alto	Charleston Road	Application D
Mountain View to Santa Clara Subsection (Alternative A and Alternative B [both viaduct options])			
36	Mountain View	Rengstorff Avenue	Application C
37	Mountain View	Castro Avenue	Application C
38	Sunnyvale	Sunnyvale Avenue	Application A
39	Sunnyvale	Mary Avenue	Application D
San Jose Diridon Station Approach Subsection (Alternative A only)			
40	San Jose	Auzerais Avenue	Application A
41	San Jose	Virginia Street	Application A

Sources: Authority 2019b, 2019c

[1] Application A would add two vehicular arm gates or four vehicular arm gates (if length of vehicular arm gates is to span longer than 32 feet) and channelizers on the crossing and adjacent lanes and streets that have more than one lane.
Application B would add two vehicular arm gates and a 50-foot raised median or extend the raised median on the crossing street.
Application B1 would add two vehicular arm gates, two pedestrian arm gates, two pedestrian swing gates, channelizers on adjacent lanes, and a 50-foot raised median or extend the raised median on the crossing street.
Application C would add four vehicular arm gates and a 50-foot raised median or extend the raised median on the crossing street.
Application D would add two vehicular arm gates, channelizers on crossing streets, and a 50-foot raised median or extend the raised median on the crossing street.
Application E would add two vehicular arm gates, channelizers on crossing streets, and a 50-foot raised median or extend the raised median on the crossing street.

[2] Fair Oaks Lane already has four-quadrant gates; therefore, no additional improvements are proposed.

The project would also complete the perimeter fencing of the Caltrain right-of-way, which would reduce the potential for train conflicts with motor vehicles, pedestrians, and cyclists and would discourage trespassing.

Safety improvements at the Broadway Caltrain Station (Alternatives A and B) and College Park Caltrain Station (Alternative A only) implemented by the project would improve passenger safety

at these stations. New northbound outboard platforms would be built to eliminate the need for passengers to board and alight the train from between the active tracks. The project would include numerous safety improvements at the at-grade crossings, along the right-of-way, and at stations; therefore, project operations would not likely increase the frequency of incidents with motor vehicles, pedestrians, and cyclists such that the demand for emergency services would increase. Therefore, expansion of existing fire, rescue, and emergency services facilities would not be needed, and new or physically altered emergency response facilities that could create physical impacts on the environment are not anticipated to be needed as a result of the project.

The Authority will collaborate with Caltrain and local responders (as appropriate) to develop a fire and life safety plan, a system security plan, and an SEPP for emergency response. The system security plan will establish design features to maintain security and facilitate emergency response at stations, within the right-of-way, and onboard trains. The Authority will coordinate with Caltrain and local emergency service providers (as appropriate) in developing the system security plan and SEPP to establish an efficient and coordinated response protocol, systems, and procedures across the multiple agencies that may be involved in responding to an emergency incident. This will include establishing coordinated procedures for emergency responder access to the right-of-way, aerial track, trenches, and tunnels. These measures will facilitate effective and coordinated response in the event of an accident or other emergency and thereby reduce the need for construction of new emergency response infrastructure or expansion of existing infrastructure to provide service.

Additionally, the Authority will require the design of the HSR system and subsystem elements that could affect the safety of passengers, employees, emergency responders, and the general public to include hazard assessment and hazard management. As part of the design process, hazards will be assessed at the programmatic level using preliminary hazard analysis (PHA) techniques, and then hazards will be further assessed at the site-specific level using site-specific hazard analysis techniques. The hazard identification and hazard management program will be described in detail in the SSMPs for construction.

The Authority will develop an SSP and an SEPP prior to commencement of operation of the HSR (SS-IAMF#2). The SSP and SEPP will address hazards identified in the PHA and other hazard analyses conducted as part of the design process. The main components of an SSP include a risk-based hazard management program and risk-based hazard analysis for HSR operations. The SSP will require a risk-based hazard management program and risk-based hazard analysis to identify hazards and resulting risks on the HSR operating system, and also identify strategies for avoiding and minimizing those hazards and risks to the extent practicable. The SSP will describe the procedures, processes, and programs that support the safety and security goals of the SSP. These procedures, processes, and programs will include a maintenance, inspection, and repair program; a rules compliance and procedures review program; an employee and contractor training program; and a public safety outreach program. The risk-based SSMP and SSP will avoid incidents to which local emergency responders could be required to respond, and thereby minimize the potential for increased demand for emergency services that could lead to the need to build new emergency response infrastructure or expand existing emergency response infrastructure. The Authority will identify risk and hazards and apply methods to reduce or eliminate the identified hazards, thereby reducing risk.

Increased passenger traffic at the existing 4th and King Street, Millbrae, and San Jose Diridon Stations could increase the demand for police, fire, and ambulance services in the vicinity of the existing stations. Because security and law enforcement within and adjacent to the Caltrain right-of-way are provided by the San Mateo County Sheriff's Office Transit Police Bureau, and also provided by the BART police at the Millbrae Station, no increased demand for police protection from adjacent local jurisdictions is anticipated. The East or West Brisbane LMF would have controlled access with on-site security, so no increased demand for police protection is anticipated. Other emergency services for HSR stations and the Brisbane LMF would be provided from existing fire and emergency response service providers and facilities, as shown in Table 3.11-2 and Table 3.11-3. The project likely would not require construction of new or expansion of

existing emergency facilities because the anticipated increase in emergency services would not be substantial.

CEQA Conclusion

There would be a less-than-significant impact under CEQA on the demand for emergency services by the project alternatives because the project would improve safety conditions for motor vehicles, pedestrians, and cyclists at the at-grade crossings and along the perimeter of the rail right-of-way, and would improve safety for Caltrain passengers at the Broadway Station (Alternatives A and B) and College Park Station (Alternative A only). Furthermore, the Authority will develop a risk-based SSMP and SSP, fire and life safety programs, and an SEPP that reduce the incidence and potential consequences of incidents to which local emergency responders could be required to respond. As a result, service ratios, response times, and other performance objectives, as documented in this analysis, would remain the same, and there would be no need to alter or build new governmental facilities to maintain acceptable service ratios, response times, or other performance objectives. Therefore, CEQA does not require any mitigation.

Impact S&S#5: Continuous Permanent Direct Impacts on Emergency Access and Response Time Related to the HSR System

The project would involve the operation of HSR trains predominantly on existing at-grade tracks within a fenced right-of-way. The project would not limit access of emergency service to the right-of-way, stations, or Brisbane LMF in the event of an incident due to any new project infrastructure. The blended system would allow for access of emergency personnel and equipment to the right-of-way, stations, and LMF, and egress/rescue of passengers during an emergency. Because the project would not further limit access for emergency responders relative to existing conditions, delays in emergency response would not occur during an emergency event.

The Authority will incorporate safety and security measures into the blended system design, such as emergency operating procedures that address emergency situations, and a fire and life safety program and security and emergency response plan that will address the safety of passengers and employees during an emergency response (SS-IAMF#2). The Authority will prepare an SSP and SEPP prior to commencing operations (SS-IAMF#2). The Authority will coordinate with local emergency service providers in developing the SSP and SEPP to establish an efficient and coordinated response protocol, as well as systems and procedures across the multiple agencies involved in responding to an emergency incident. This will include coordinating procedures for emergency responder access to the right-of-way, stations, and Brisbane LMF.

CEQA Conclusion

The direct impact of the project alternatives on emergency services access during project operations related to the HSR system would be less than significant under CEQA because the project would not limit access of emergency service to the right-of-way, stations, or Brisbane LMF due to any new project infrastructure in the event of an incident. Furthermore, project design features include emergency operating procedures, SSP, SEPP, and a fire and life safety program (SS-IAMF#2). The emergency operating procedures, response plans, fire and life safety program, and coordination with local emergency response providers will minimize potential impacts on emergency access by providing coordinated access to access-controlled areas and emergency operating procedures in the event of an emergency or evacuation. Therefore, permanent operations impacts on emergency response related to the HSR system would be minimized. Therefore, CEQA does not require any mitigation.

Impact S&S#6: Continuous Permanent Impacts on Emergency Access and Response Times Due to Station Traffic and Increased Gate-Down Time

At-Grade Crossing Gate Technology

An at-grade crossing is an intersection of railroad tracks, roadways, walkways, or a combination of these at the same level. All other crossings in the study corridor are grade separated, meaning that roadways, walkways, and railroads cross at different, non-conflicting elevations. Gates on both sides of the tracks are in place at all at-grade crossing locations. When no train is present at a crossing, the gates are up or inactive. A gate-down event occurs when these gates come down

at the crossing because a train is either passing, crossing, or stopping at a nearby station. It can also be due to simultaneous passing of two trains in opposite directions. Gate-down time, which is a key measurement for both the performance of existing and future operations at these locations, is a summation of multiple actions that occur in sequence in order to provide safe crossing for all modes at the at-grade crossing. These actions are, in chronological order:

- Gate flashers located on gate arms to increase visibility are triggered by a gate crossing event.
- Gate arms descend, moving from vertical to horizontal position, indicating that all vehicular, bicycle, and pedestrian traffic must stop at the crossing to allow the train(s) to pass safely.
- Train passes and fully clears the crossing.
- Gate arms rise, moving from horizontal to vertical position.

After this sequence is complete, pedestrian, bicycle, and vehicular traffic can resume regular operations through the crossing. Per Caltrain specifications, the existing crossing control systems are designed to provide 25 to 30 seconds of right-of-way clearance between the time the gates come down and warning lights turn on and the arrival of the train at the crossing. This is more than the 20-second federally required minimum for right-of-way clearance time by the *Manual on Uniform Traffic Control Devices for Streets and Highways* (Federal Highway Administration 2012). The total gate-down time at the crossing includes the time for the train to pass through the crossing and the gates to come up once the train has been detected to have exited the crossing. It is governed by the speed of the train, geometric configuration of the specific crossing, and other site-specific characteristics.

Signalized intersections near at-grade crossings typically have traffic signal preemption connected to the crossing gate and warning light systems. The signal preemption process generally provides for 5 to 15 seconds of green time to allow queues between the grade crossing and traffic signal to dissipate. During this period, the crossing gates are down, thus prohibiting vehicles from entering the crossing. After the track clearance interval, signals either flash red for all movements (acting as an all-way stop-controlled intersection) or selectively dwell on a green phase for movements that do not contribute volume to the grade crossing (i.e., movements parallel to the rail line). After the train passes through the crossing, the signal resumes regular phasing and timing patterns.

Caltrain trains are controlled by a wayside block signal system composed of signals alongside the track that convey to the train engineer occupancy and/or routing status ahead. It controls train separation to match safe braking needs for Caltrain's diesel-hauled trains. A key constraining factor in the existing Caltrain capacity is the wayside signal system because it forces train separation based on the poorest performing train type. As of December 2020, PTC has been implemented within the Caltrain corridor as part of the Caltrain Modernization Program.

The HSR project will modify and improve all at-grade crossings in the corridor where four-quadrant gates do not exist. These improvements include the installation of four-quadrant gates at the at-grade crossings along the corridor with new train detection and control equipment. Four-quadrant gates include gate mechanisms on both sides of the tracks for both directions of automotive traffic. The exit gates blocking the road leading away from the tracks in this application are equipped with a delay and begin their descent to their horizontal position several seconds after the entrance gates do, to avoid trapping roadway vehicles on the crossing. Four-quadrant gates are a lower safety risk than two-quadrant gates as they prevent drivers from illegally driving their vehicles around lowered gates.

The new at-grade crossing control and traffic preemption equipment will be designed to minimize the total gate-down time at crossings, while satisfying mandatory requirements and providing for safe warning and clearance intervals. The total time that the warning lights are on and the crossing gates are down would vary by location due to site-specific factors, including train speed and the crossing's geometric configuration. The longest gate-down times would be at crossings adjacent to the 4th and King Street Station in San Francisco and the San Jose Diridon Station (68

seconds). For the remaining at-grade crossings, gate-down times for single HSR trains would range from 39 to 54 seconds.

Effects from Increased Gate-Down Time at the At-Grade Crossings

The addition of HSR trains would increase gate-down times at the at-grade crossings along the rail corridor. The Authority conducted a screening analysis of potential effects on emergency vehicle response times through a geospatial assessment of fire stations along both sides of the rail corridor. The screening analysis used GIS to evaluate the potential effect on travel time between the nearest fire station and various 0.25-mile grid cells under a worst-case scenario such that every responding fire station vehicle or ambulance was required to take an alternate route through an existing grade-separated crossing because of added gate-down time at the at-grade crossings. Figure 3.11-20 and Figure 3.11-21 illustrate the results of the screening analysis, including a discussion of areas that would experience added response times of 30 seconds or more under the above full closure scenario.

The project would not block emergency vehicle access permanently because roadway access would not be permanently blocked to any response areas. However, the project would affect emergency vehicle response time delays due to station traffic at the 4th and King Street, Millbrae, and San Jose Diridon Stations, as well as increased gate-down events at the at-grade crossings from added HSR trains. The DDV would have the same ridership and train service as Alternative A without the DDV; therefore, the emergency response times related to station traffic and gate-down times at the at-grade crossings would be the same for Alternative A with the DDV and Alternative A without the DDV. Alternative A and Alternative B would have the same effects due to station traffic and gate-down time increases at the at-grade crossings between San Francisco and the San Jose Diridon Station. Alternative A would increase gate-down times at the at-grade crossings south of the San Jose Diridon Station at Auzerais Avenue and West Virginia Street.

Effects in Fire Stations/First Responders Response Areas

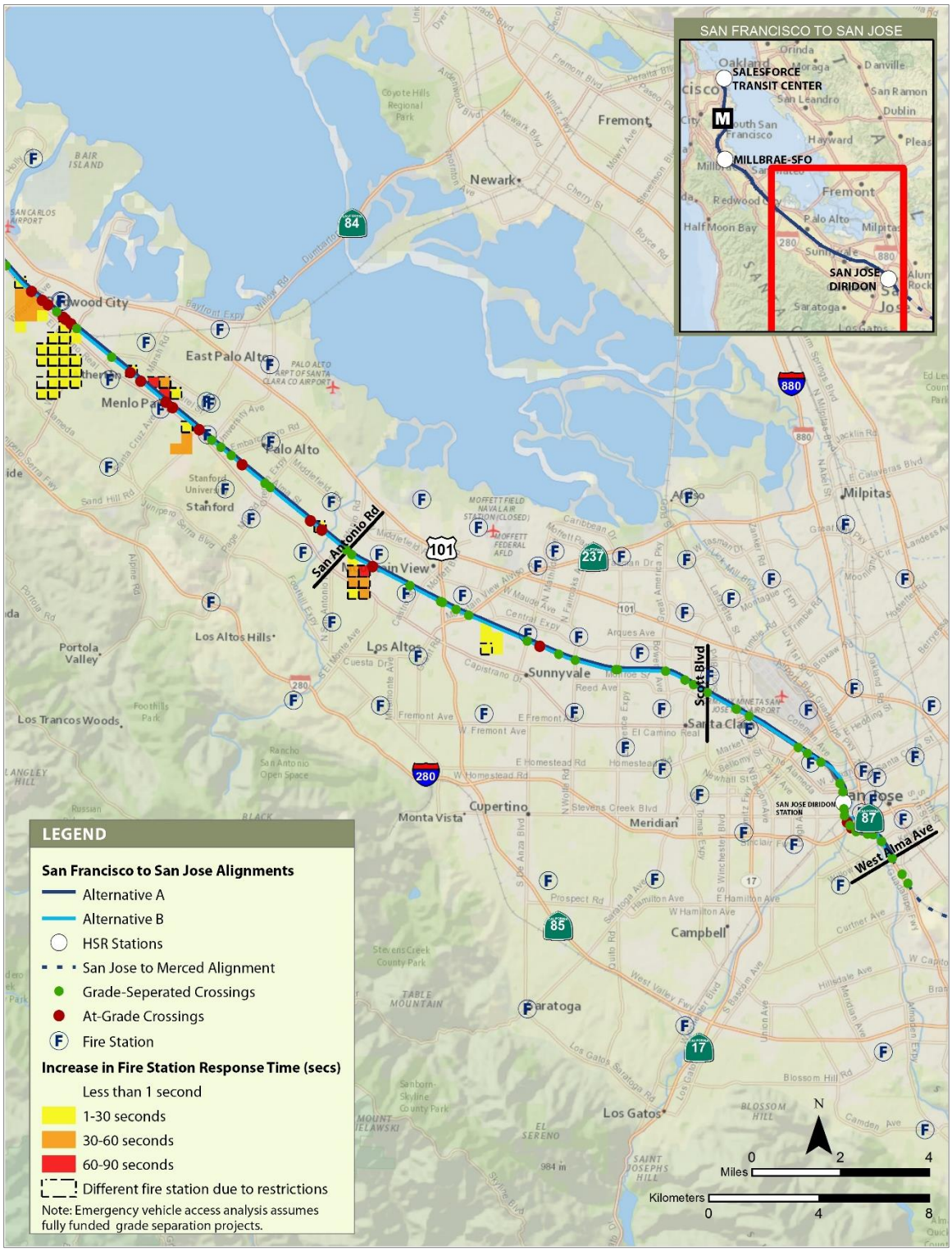
The screening analysis indicates a potential delay of 30 seconds or more for emergency access and response times to fire station vehicles or first responder ambulances at the following fire station response areas along the corridor:

- Burlingame—Area east of rail corridor between Oak Grove Avenue and Howard Avenue
- Redwood City—Area west of rail corridor between Whipple Avenue and Broadway
- Menlo Park—Area east of rail corridor centered on Ravenswood Avenue and Oak Grove Avenue
- Menlo Park/Palo Alto—Area west of rail corridor along city boundaries just north of Sand Hill Road
- Mountain View—Area west of rail corridor centered on Rengstorff Avenue

The delay effects on fire station/first responder response times is caused by a combination of an increase in gate-down events generated by added HSR trains and an increase in vehicle traffic generated by Bay Area population and employment growth. The screening analysis indicates a potential for effects of 30 seconds or more on emergency and response times to fire station response areas at eight at-grade crossings along the Project Section. At build-out, the project would add up to eight new gate-down events at these at-grade crossings, with average gate-down times estimated to range from 47 seconds to 71 seconds per gate-down event. Traffic volumes would increase, based on a comparison of forecasted 2040 No Project volumes to existing traffic counts, by approximately 30 to 90 percent at the eight at-grade crossings during the weekday PM peak hour. This includes increased traffic volumes of approximately 80 percent at the three Burlingame at-grade crossings, 90 percent at the three Redwood City at-grade crossings, 30 percent at the Menlo Park at-grade crossing, and 90 percent at the Mountain View at-grade crossing.

MARCH 2020

Figure 3.11-20 Fire Station Screening Analysis Results (North)



MARCH 2020

Figure 3.11-21 Fire Station Screening Analysis Results (South)

The project would cause added delays and effects on fire station emergency vehicle response times due to increased gate-down times at the following five locations:

- In Burlingame, the fire station at 799 California Drive is just west of the rail corridor and north of Oak Grove Avenue. Access from this fire station to properties on the east side of the rail tracks occurs via the Oak Grove Avenue, North Lane, and Howard Lane at-grade crossings. The nearest grade-separated crossings of the rail corridor are more than 2 miles north and south of this fire station. These areas on the east side of the rail corridor could experience increased response time by up to 120 seconds.
- In Redwood City, Fire Station 9 at 755 Marshall Street is on the east side of the rail tracks. Access from Fire Station 9 to properties on the west side of the rail tracks between Whipple Avenue and Broadway is provided most directly via crossings at Broadway, Brewster Avenue, and Whipple Avenue. Jefferson Avenue, a grade-separated crossing of the tracks south of Broadway, provides an alternative but indirect route to properties on the west side of the rail tracks between Broadway and Whipple Avenue. These areas on the west side of the rail corridor could experience increased response time by up to 60 seconds.
- In Menlo Park, the Headquarters Fire Station at 300 Middlefield Road is on the east side of the rail tracks, and Fire Station 6 at 700 Oak Grove Avenue is on the west side of the rail tracks. Together, these two fire stations serve properties on both sides of the tracks. Access from these stations across the rail tracks is provided by at-grade crossings at Ravenswood Avenue and Oak Grove Avenue. These areas could experience increased response time by up to 90 seconds.
- On the border of Menlo Park and Palo Alto just north of Sand Hill Road, a small area west of El Camino Real would experience potential delays in response time from the University Park Fire Station at 301 Alma Street. The University Park Fire Station is on the east side of the rail tracks and would use the Alma Street at-grade crossing to access the properties on the west side. The next closest fire station to the properties is approximately 0.75 mile to the north (Menlo Park Fire Station 6 at 700 Oak Grove Avenue). Access from Menlo Park Fire Station 6 to these areas would take slightly longer than the University Park Fire Station but would not be affected by added gate-down events. Menlo Park Fire Station 6 is on the same side of the rail corridor as the affected properties. These areas on the west side of the rail corridor could experience increased response time by up to 60 seconds.
- In Mountain View, Fire Station 3 at 301 North Rengstorff Avenue is on the east side of the rail corridor. Access from this fire station to properties on the west side of the rail corridor is provided by the existing at-grade crossing at Rengstorff Avenue. These areas on the west side of the rail corridor could experience increased response time by up to 90 seconds.

Effects on Emergency Vehicle Response from Increased HSR Station and Light Maintenance Facility Traffic

Potential effects on emergency vehicle response times due to HSR stations and LMF traffic are informed by future intersection LOS performance and the relationship of fire stations/first responders to affected intersections. Impact TR#5 in Section 3.2 describes roadway and intersection effects for each of the subsections. The Authority identified locations where increases in emergency response times for fire stations/first responders could occur and identified effects based on a 30-second threshold increase in response time. The following summarizes these effects as they relate to emergency vehicle response times, which would be the same for both project alternatives:

- **4th and King Street Station**—The addition of HSR service at the station would generate approximately 360 peak-hour vehicle trips and cause effects at several intersections along Fourth and Fifth Streets between the station area and I-80 to the north. The additional delay from increased vehicle traffic at intersections in the station area under either project alternative would affect egress from Fire Station 8 in San Francisco, located about 0.1 mile north of the station at 36 Bluxome Street between Fourth and Fifth Streets, and would have effects on fire station emergency response times.

- **Millbrae Station**—The addition of HSR service at the Millbrae Station would generate a total of approximately 280 peak-hour vehicle trips, about 60 of which would travel along El Camino Real. This added station traffic would affect several intersections along El Camino Real between Victoria Avenue and Trousdale Drive. The additional delay from increased vehicle traffic at intersections in the station area under either project alternative would delay emergency vehicle response times from Fire Station 37 in Millbrae, located about 0.5 mile north of the Millbrae Station at 511 Magnolia Avenue, because El Camino Real is a key response route for the fire station service area.
- **Brisbane LMF**—The East and West Brisbane LMF sites would generate about 70 peak-hour vehicle trips and would affect two intersections on Harney Way on the east side of US 101. The nearest fire stations to the LMF sites are the Brisbane Fire Station at 3455 Bayshore Boulevard and San Francisco Station 44 at 1298 Girard Street. The LMF would not affect traffic at study intersections along Bayshore Boulevard or Geneva Avenue, which are primary access routes for these two fire stations. As such, the added traffic generated by the LMF would not affect fire station emergency response times.
- **San Jose Diridon Station**—The addition of HSR service at the San Jose Diridon Station would generate a total of approximately 1,100 peak-hour vehicle trips and would affect a number of intersections in the general vicinity of the station. The nearest fire stations are San Jose Fire Station 1 (1.0 mile northeast of the station at 225 North Market Street) and San Jose Fire Station 30 (0.7 mile southeast of the station at 454 Auzerais Avenue). The addition of HSR service would affect study intersections along Bird Avenue, South Autumn Street, The Alameda/West Santa Clara Street, Auzerais Avenue, Delmas Avenue, West San Carlos Street, and West Taylor Street. The added station traffic would not affect study intersections along West Julian Street, which is a parallel access route for San Jose Fire Station 1. However, the added traffic generated by HSR service under either project alternative would affect study intersections along Bird Avenue, which is a primary north-south route for Fire Station 30. While the City of San Jose has installed EVP in 900 intersections in San Jose, EVP is not present at all intersections, which means that EVP is not universally present along all potential emergency response routes within the RSA. As a result, the added traffic generated by HSR service under either project alternative would affect fire station emergency vehicle response times where EVP is not present.

CEQA Conclusion

The impact on emergency vehicle response times from increased traffic at HSR stations and increased gate-down time would be significant under CEQA for both project alternatives. The added traffic at the 4th and King Street, Millbrae, and San Jose Diridon Stations would cause a significant impact, except at intersections in San Jose where EVP is already in place; impacts would be less than significant at such intersections. Added traffic at the East or West Brisbane LMF would not cause a significant impact on emergency access and response times for either project alternative. The increase in gate-down time from added HSR trains would result in potential delays and a significant impact on fire station emergency vehicle access and response times in Burlingame, Redwood City, Menlo Park, Palo Alto, and Mountain View for both project alternatives. The added traffic at the HSR stations and the delays associated with gate-down time from added HSR trains would increase emergency response times by more than 30 seconds for seven fire stations in San Francisco, Millbrae, Burlingame, Redwood City, Menlo Park, Palo Alto, Mountain View, and San Jose. Mitigation measures to address this impact are identified in Section 3.11.9. Section 3.11.7 describes the measures in detail.

3.11.6.3 Community Safety and Security

Construction and operations of either project alternative would result in temporary and permanent changes to community safety and security within the RSA. Potential impacts from project construction include temporary exposure to construction site hazards, temporary and permanent exposure to traffic hazards, and temporary exposure to Valley fever. Operations of the trains, stations, and LMF could also result in continuous permanent operational safety impacts, interference with airport safety, and safety hazards to schools.

No Project Impacts

The conditions describing the No Project Alternative are the same as those described in Section 3.11.6.2. The population in San Francisco, San Mateo, and Santa Clara Counties is projected to increase through 2040. Development projects to accommodate projected population and employment growth, including shopping centers, industrial parks, transportation projects, and residential developments, would continue under the No Project Alternative and could result in direct and indirect impacts on safety and security, including community safety and security.

Violent and property crime rates increased in San Francisco and San Mateo Counties between 2010 and 2015, and declined in Santa Clara County. In 2015, 3,241 Part 1 Offenses occurred on the Metro and BART lines combined (FBI 2015c). In that same year, Caltrain passengers placed 11,554 calls for police services and transit police made 188 felony and misdemeanor arrests, 441 ejections, and 38 crisis interventions with emergency commitments (Caltrain 2015). It is expected that crime rates within the three-county region and on transit system would continue under the No Project Alternative. However, crime rates depend, in part, on economic conditions and societal trends. Planned development and transportation projects that would occur as part of the No Project Alternative would likely include various forms of mitigation to address impacts on safety and security.

Future development projects in San Francisco, San Mateo, and Santa Clara Counties include implementation of airport development and land use plans, and implementation of general and specific plans throughout all three counties. Most of the planned growth would occur in the form of redevelopment and infill development, which would further increase the population density within the safety and security RSA. As discussed in Section 3.2, this population and employment growth would contribute to increased vehicular traffic that would outpace the ability of future transportation improvements to expand capacity. It is expected that existing accident motor vehicle rates would continue into the future.

Planned and other reasonably foreseeable projects under the No Project Alternative would also include transportation improvements along the Caltrain corridor such as the 25th Avenue Grade-Separation Project and the South San Francisco Station Improvement Project, both of which are scheduled to complete construction in 2021. These grade-separation and station improvement projects would eliminate conflicts with motor vehicles, pedestrians, and cyclists, improving safety conditions within the project corridor under the No Project Alternative.

Project Impacts

Construction Impacts

Impact S&S#7: Temporary Exposure to Criminal Activity at Construction Sites

Criminal activity at or around HSR construction sites could include theft of equipment and materials or vandalism after work hours. The potential risk of criminal activity would be similar for Alternative A and Alternative B, with the exception of the construction of the passing track under Alternative B, which would result in an additional construction footprint that would not be created for Alternative A. The amount of construction effort for the DDV would be approximately the same and would occur in the same locations as Alternative A without the DDV; therefore, there would be no difference in construction-period effects on safety and security for Alternative A with the DDV. Construction contractors will institute security measures common to construction sites, including securing equipment and materials in fenced and locked storage areas. The project-specific SSMP will include security lighting, fencing, and monitoring measures to provide security to construction sites and protect the security of construction workers and equipment both during and after work hours (SS-IAMF#2). Security lighting will be required to be focused on the site, minimizing light spillage onto neighboring properties. These project features minimize temporary security impacts of construction and the project construction will not result in additional demands on emergency services.

CEQA Conclusion

The impact of project construction on safety and security from criminal activities at construction sites would be less than significant under CEQA for both project alternatives because the risk will be minimized by storing equipment and materials in secured areas and using security personnel and security lighting to monitor equipment after work hours. These security measures minimize the potential for theft and vandalism and, therefore, project construction would not result in a safety or security hazard or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Impact S&S#8: Temporary Exposure to Construction Site Hazards

Construction of the project alternatives would include modifying and relocating existing tracks, stations, and platforms; modifying existing roadways and structures; building the Brisbane LMF; building viaducts and passing track (under Alternative B); installing four-quadrant gates at the at-grade crossings and perimeter fencing at the edge of the right-of-way; utility relocation; site preparation including demolition, excavation, and grading; and installing systems components. The amount of construction effort for the DDV would be approximately the same and would occur in the same locations as Alternative A without the DDV; therefore, there would be no difference in construction-period effects on safety and security for Alternative A with the DDV. Some of these construction activities would involve the operation of heavy equipment on-site, earthwork, and other major construction activities, including the transportation of overweight and oversized materials. Throughout construction of the project, workers could be exposed to hazards associated with construction site equipment and activities. Refer to Section 3.10 for an analysis of the potential health and safety risks to the public and workers from the exposure to hazardous wastes and hazardous materials generated during construction.

Construction would increase the risk of exposure of construction workers to construction equipment and activity hazards that could result in workplace accidents, potentially causing accidental injuries or deaths of construction workers or potentially affecting the public in the event of a workplace accident, such as a fire or explosion, resulting in off-site consequences. Construction activities could also expose construction workers to hazardous chemicals and construction and demolition materials. Construction activities would differ for the alternatives because of construction site conditions and project design. While construction of the East or West Brisbane LMF would require similar amounts of grading and excavation, construction of the East Brisbane LMF would occur on the site of the former Brisbane Landfill, while construction of the West Brisbane LMF would occur on the site of a former Southern Pacific Railroad railyard. As discussed in Section 3.10, construction of the East Brisbane LMF under Alternative A would have increased safety risks due to the potential to encounter flammable methane gas during construction. However, construction of Alternative B would involve more building demolition than Alternative A and would require additional major construction activities associated with construction of the passing track and viaducts, which would only occur under Alternative B and would introduce the potential for additional construction site hazards relative to Alternative A.

Worksite safety in California, including construction worksite safety, is regulated by provisions of Title 8 of the Cal. Code Regs., and overseen by Cal-OSHA. Title 8 requires compliance with standard procedures to prevent construction worksite accidents and requires a written workplace injury and illness prevention program to be in place (Cal. Code Regs., Title 8, § 1502 et seq.; Cal-OSHA 2013, 2015).

The Authority will develop an SSMP (SS-IAMF#2), which includes construction worker safety standards, worker safety and health plans, fire/life safety programs, construction on-site security plans, and emergency response and evacuation procedures to maintain the safety of all construction workers and the public during project construction. The contractor will document in a technical memorandum how plans, programs, and guidelines were considered and incorporated into the design and construction of the project and how they will comply with standard operating procedures to reduce construction site hazards and minimize the potential for construction worksite accidents. The technical memorandum will also document how safety measures, site-specific health and safety plans, and site-specific security plans establish minimum safety and

security guidelines for contractors of, and visitors to, the construction site. The contractor will comply with and be responsible for a written workplace injury and illness prevention program (Cal. Code Regs., Title 8, § 1502 et seq.; Cal-OSHA 2013, 2015), thereby reducing the potential for accidents at construction sites. Contractors will be required to develop site-specific measures that address regulatory requirements to protect human health and property at construction sites. Sites requiring these measures include any sites involved in construction activities; therefore, workers will be trained in safety and security measures. Safety programs and safety standards will minimize impacts from construction site hazards and accident risks that could compromise the safety or health of workers or visitors.

CEQA Conclusion

The impact of project construction on community safety and security from workplace hazards during construction activities would be less than significant under CEQA because exposure of workers, visitors, or the public to potential construction site hazards and accident risks during construction activities will be minimized through compliance with legal requirements and effective safety plans that reduce the potential of construction site hazards and accidents (SS-IAMF#2). Through effective planning and compliance, the project features minimize temporary exposure of workers and the public to construction site hazards and, therefore, project construction would not result in a safety or security hazard or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Impact S&S#9: Temporary Exposure to Construction-Related Traffic Hazards

Construction of the project would require some temporary and permanent roadway and lane closures for the project alternatives associated with the construction of the East or West Brisbane LMF, the Millbrae Station, modification of the San Jose Diridon Station, and the installation of four-quadrant gates at the at-grade crossings, as described under Impact S&S#6. Temporary roadway and lane closures would result in changes in vehicle circulation, reduced speed limits, detours, and congestion and delay along roadways and at intersections. The operation of construction vehicles and heavy equipment during temporary road closures and detours would increase the risk of traffic accidents. At these sites, temporary road closures and detours could distract automobile drivers, pedestrians, and cyclists, leading to an increased safety risk from traffic hazards. Motor vehicle drivers, bicyclists, and pedestrians may not react in a timely manner when encountering a new detour, road closure, or realignment, which could increase the risk of accidents. Drivers, bicycles, and pedestrians may also encounter traffic hazards caused by construction vehicles and equipment entering and exiting the work areas.

Table 3.11-9 identifies the specific locations and anticipated durations of these roadway and lane closures. Temporary roadway and lane closures would be similar under Alternative A and Alternative B (both viaduct options) in the San Francisco to South San Francisco, San Bruno to San Mateo, and Mountain View to Santa Clara Subsections. In the San Mateo to Palo Alto Subsection, Alternative B would require more temporary roadway and lane closures given the additional track and station modifications associated with construction of the passing track. Alternative B would replace the Ralston Avenue underpass in Belmont and the Holly Street underpass in Redwood City, and would extend existing underpasses at 25th Avenue, 28th Avenue, 31st Avenue, and 42nd Avenue in San Mateo; Harbor Boulevard in Belmont; and Brittan Avenue and Howard Avenue in San Carlos. Construction would last from 6 to 9 months for each underpass. As a result, the potential temporary exposure to traffic hazards from temporary roadway and lane closures would be greater under Alternative B (both viaduct options) than Alternative A in the San Mateo to Palo Alto Subsection. In the San Jose Diridon Station Approach Subsection, Alternative B would require a greater extent of temporary roadway and/or lane closures to accommodate grade-separated viaduct structures. Overall, Alternative B would involve more substantial roadway modifications than Alternative A and thus would have greater effects on road traffic, including emergency vehicle traffic during construction.

As part of project design, the Authority will develop a construction safety transportation management plan (SS-IAMF#1). The plan will specify the contractor's procedures for temporary road closures, including maintaining vehicle, bicycle, and pedestrian access to residences and

businesses during construction, lane closure safety barriers, signage and flag persons to direct vehicle and bicycle traffic and pedestrians, temporary detour provisions, alternative bus and delivery routes, emergency vehicle access, and alternative access locations. The plan will establish procedures for the contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access during construction. Construction of road closures will also be staggered, so that the next adjacent road to the north and south of a road temporarily closed for construction will remain open to accommodate detoured traffic. This will typically limit out-of-direction travel to 1 or 2 miles during temporary road closures. In addition, a CTP will be prepared that will identify when and where temporary closures and detours will occur, with the goal of maintaining traffic flow, especially during peak travel periods (TR-IAMF#2). The CTP, which will be coordinated with local jurisdictions and reviewed and approved by the Authority, will provide traffic controls, including signage to alert drivers to the construction zone, traffic control methods, traffic speed limitations, alternative access and detour provisions during road closures, and provisions for 24-hour access by emergency vehicles.

The contractor will identify potential traffic hazard impacts during construction and will consult with each potentially affected local jurisdiction to establish a plan to maintain traffic safety during project construction. The plan will address the design of road closures and realignments; timing of construction work; operation of construction work areas including placement of barriers, signage, and flag persons; and procedures for movement of construction vehicles into and out of the work areas. Therefore, design features will minimize the potential for vehicular, pedestrian, and bicycle traffic accidents from construction of either project alternative.

CEQA Conclusion

The impact of the project on community safety from temporary road closures and detours during construction would be less than significant under CEQA because increased exposure of motor vehicle drivers, pedestrians, and bicyclists to traffic hazards will effectively be minimized through a construction safety transportation management plan (SS-IAMF#1). The plan will establish procedures for the contractor to coordinate with local jurisdictions to maintain emergency vehicle access during construction and establish traffic safety measures (e.g., safety barriers, signage, flag persons) for reducing exposure to traffic hazards during temporary road closures and detours as well as requirements for staggering road closures, which will limit the extent of out of direction travel. Effective coordination with local jurisdictions, emergency vehicle access procedures and traffic control plan, staggered road closures, and vehicle and bicycle traffic and pedestrian safety project features minimize temporary construction impacts on the safety of motor vehicle drivers, pedestrians, and bicyclists exposed to traffic hazards. Construction of the project would not result in a safety or security hazard or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Impact S&S#10: Permanent Exposure to Traffic Hazards

The only permanent road closure under Alternative A would occur at Serra Avenue, a short local street between El Camino Real and the Millbrae Station in Millbrae, which would be replaced by an extension of California Drive from Linden Avenue to Victoria Avenue. Serra Avenue would also be closed and replaced by an extension of California Drive under Alternative B (both viaduct options). These roadway changes would not permanently affect local vehicle circulation, would enhance multimodal access to the Millbrae Station on the west side of the existing Caltrain corridor, and would improve intersection LOS on this portion of El Camino Real.

Alternative B (both viaduct options) would also permanently close University Avenue, Stockton Avenue, and Emory Street in the San Jose Diridon Station Approach Subsection. Because these roads are not through roads across the Caltrain right-of-way, their shortening would have no substantial permanent impact on vehicle circulation or emergency access and response times. A section of Chestnut Street in San Jose would be closed under Alternative B (Viaduct to I-880). For Alternative B (Viaduct to I-880), Chestnut Street in San Jose would be realigned and closed between Asbury Street and West Taylor Street; traffic would be able to use Asbury Street to access Coleman Avenue and Taylor Street and thus the closure of one block would not

substantially affect vehicle circulation or emergency access and response times. For Alternative B (Viaduct to Scott Boulevard), Chestnut Street would be realigned but not closed.

Construction of either the East or West Brisbane LMF would require the permanent realignment of the southern terminus of the Tunnel Avenue overpass from the intersection of Bayshore Boulevard/Old County Road to Bayshore Boulevard/Valley Drive Tunnel Avenue overpass and the realignment of Lagoon Road to connect to the realigned Tunnel Avenue. These changes would improve LOS conditions at the intersection of Bayshore Boulevard/Old County Road. The improvements in flow of traffic near the Millbrae Station and Bayshore Boulevard/Old County Road would have a beneficial effect on traffic safety. With exception of these changes, the permanent road configurations after completion of construction would be the same as before construction.

Additionally, the installation of four-quadrant gates, barriers, and roadway channelization at 40 at-grade crossings for Alternative A and 38 at-grade crossings for Alternative B (both viaduct options) would prevent drivers from traveling in opposing lanes to avoid the lowered gate arms. Pedestrian crossing gates would be built parallel to the tracks and would be aligned with the vehicular gates on either side of the roadway. The project would also complete the perimeter fencing of the Caltrain right-of-way, which would reduce the potential for train conflicts with motor vehicles, pedestrians, and cyclists and discourage trespassing. These project elements would have a beneficial effect on vehicular and pedestrian safety and would reduce traffic hazards by minimizing the potential for conflicts between trains and motor vehicles, pedestrians, and bicycles.

CEQA Conclusion

The impact on community safety related to permanent roadway closures and relocations would be less than significant under CEQA because the project's permanent roadway closures and relocations would improve the flow of traffic near the Millbrae Station and Bayshore Boulevard/Old County Road. These permanent roadway changes would result in a beneficial effect on traffic safety and would reduce the public's exposure to traffic hazards associated with congestion. In addition, the project includes safety improvements throughout the project corridor that reduce traffic hazards by minimizing potential for conflicts between trains and motor vehicles, pedestrians, and bicycles, resulting in a beneficial effect on community safety. Therefore, CEQA does not require any mitigation.

Impact S&S#11: Permanent Interference with Airport Safety

Safety hazards to aviation can result from the development of land uses that are incompatible with airport operations or the imposition of airspace obstructions or structures that represent hazards to aviation. FAA conducts aeronautical studies of proposed construction of structures that would exceed structure height limits established by FAR Part 77. The purpose of these studies is to determine whether the proposed structures would obstruct airspace or represent navigation hazards to aircraft or hazards to people on the ground in areas exposed to aircraft overflight. The airport hazards analysis (Volume 2, Appendix 3.11-B) evaluates whether construction of either project alternative would impinge upon the AIAs for any of the five public or public use airports in the RSA, thus constituting a potential impact under CEQA. The online FAR Part 77 Notice Criteria Tool (FAA 2018a) was also used to assess FAA notification requirements for proposed construction of the alternatives.

The potential for the project alternatives to result in safety hazards in relation to airports within the RSA has been analyzed to assess whether the project footprint would encroach into the AIA of any airport, heliport, or airstrip. AIA maps included in the CLUPs for each of the following airport were considered in the analysis—SFO, SQL, Palo Alto Airport, Moffett Field, and SJC (City/County Association of Governments of San Mateo County 2012, 2015; County of Santa Clara 2016a, 2016b, 2016c).

Five public-service airports—SFO, SQL, Palo Alto Airport, Moffett Field and SJC—and five privately operated heliports all lie within 2 miles of the project footprint. No private airstrips were identified within 2 miles of the project footprint. The footprint for each project alternative encroaches into the AIAs of SFO, SQL, Moffett Field Airport and SJC. Table 3.11-11 summarizes the AIAs encroachment area (acres) of the project alternatives for each of the five airports. Table 3.11-12 identifies the proposed locations of communications towers that would require FAR Part 77 notification and the associated airport Part 77 notification (refer to Volume 2, Appendix 3.11-B for specific locations of the towers). Project construction would not affect operation of the five heliports, as the five heliports are all situated on the roofs of high-rise structures that would not be affected by the height of structures built for the project. Impacts of the DDV would be the same as Alternative A without the DDV because both variants would have the same structure elevation in areas of concern for aviation.

FAR Part 77 defines imaginary surfaces that are used to identify potential airspace obstructions and safety hazards to air navigation. The project alternatives fall within the FAR Part 77 defined horizontal surface zone for SFO, SQL, Moffett Field, and SJC.

Table 3.11-11 Airport Influence Area Encroachment Area for the Project Alternatives

Airport	Encroachment Area (acres)			
	Alternative A		Alternative B[1]	
	Temp.	Perm.	Temp.	Perm.
San Francisco International Airport (SFO)—Area A	109.4	450.6	87.2	481.9
San Carlos Airport (SQL)—Area A	4.7	155.5	37.9	172.2
Palo Alto Airport (KPAO)	0.0	0.0	0.0	0.0
Moffett Field Airport (KNUQ)	0.8	35.8	0.8	35.8
Norman Y. Mineta San Jose International Airport (SJC)	15.2	70.5	55.0/96.5	97.9/86.4
Total	**130.1**	**712.4**	**180.9/222.4**	**787.4/776.3**

Sources: County of Santa Clara 2016a, 2016b, 2016c; City/County Association of Governments of San Mateo County 2012, 2015
I- = Interstate
Perm. = permanent
Temp. = temporary
[1] Values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard) where differences exist.

Table 3.11-12 Communication Towers Requiring Federal Aviation Regulation Part 77 Notification for the Project Alternatives

Airport	City/Community	Communication Tower[1]	Height Exceedance (feet)
San Francisco International Airport (SFO)	South San Francisco	Radio tower co-located at Caltrain's TPS1 Option 4	6
	San Bruno	Standalone radio tower #3	66
	Burlingame	Radio tower co-located at Caltrain's PS3 Option 4	29
San Carlos Airport (SQL)	San Carlos	Standalone radio tower #6	26
	Redwood City	Radio tower co-located at Caltrain's SWS1[2]	15
Palo Alto Airport (KPAO)	Menlo Park	Standalone radio tower #7[2]	70
	Palo Alto	Standalone radio tower #8[2]	50

Airport	City/Community	Communication Tower[1]	Height Exceedance (feet)
Moffett Field Airport (KNUQ)	Mountain View	Standalone radio tower #9	22
	Sunnyvale	Standalone radio tower #10	91
Norman Y. Mineta/San Jose Airport (SJC)	Santa Clara	Standalone radio tower #2	61
		Standalone radio tower #1	53

I- = Interstate
PS = paralleling station
SWS1 = Caltrain's Switching Station 1, Option 2
TPS = traction power substation
[1] Radio towers apply to both alternatives.
[2] Exceeds an instrument approach area of the terminal instrument procedures.

The proposed elevations of the track and other structures that would be built as part of the project within the FAR Part 77 imaginary surfaces were assessed using the online FAR Part 77 Notice Criteria Tool. Project structures, including radio towers, that would be built within the FAR Part 77 imaginary surfaces would require the FAR Part 77 notification for both project alternatives. There would be 11 communication radio towers requiring notification for both project alternatives (refer to Volume 2, Appendix 3.11-B for specific facility locations).

According to airport land use plans for the affected AIAs, any project submitted for airport land use compatibility review for reasons of height-limit issues is required to include a copy of the FAA's evaluation and reply to the proponent's notification to the FAA using FAA Form 7460-1, Notice of Proposed Construction or Alteration (County of Santa Clara 2016a, 2016b; City of San Jose Airport Department 2018; City/County Association of Governments of San Mateo County 2012; City and County of San Francisco 2016). The FAA's Airports District Office for the San Francisco region is responsible for initiating the coordination of aeronautical studies for airports in San Mateo County and Santa Clara County (FAA 2018b). The FAA's aeronautical study for each proposed structure consists of the following:

- Evaluating the effect of the construction or alteration on existing and planned airport operating procedures
- Determining the potential hazardous effect of the proposed construction on air navigation
- Identifying mitigating measures to enhance safe air navigation

The FAA airspace review determinations distinguish between "obstructions," which FAA may consider permissible subject to appropriate mitigating measures, and aviation safety "hazards" that FAA generally would not consider to be permissible (FAA 2018b). At the conclusion of the review, FAA could issue a "determination of no hazard" for the proposed structure or identify mitigating measures for the proposed structure to mitigate an identified obstruction or an identified aviation hazard.

Locations of proposed communications structures identified as requiring FAR Part 77 notification are based on the design at the time of this analysis. Alternative locations have been identified for these communications structures that would not affect project operations. Additional analysis of proposed structure locations and development of information associated with an FAA application and registration for proposed project structures would be done as part of the final design phase of the proposed project, including communications structures, lighting/communication poles and catenary lines, power substations, station roofs, and elevated grade crossing structures. During the final design phase, the Authority would contact FAA regarding individual site-specific assessment of project structures requiring FAR Part 77 notification, including identification of potential alternative locations for consideration in FAA's site-specific aeronautical study for each structure. The Authority has begun coordinating with the FAA's Airports District Office in San

Francisco concerning structures based on the proposed design of the project and locations of structures requiring FAR Part 77 notification.

Based on assessment of the proposed locations of the communications towers and the airport locations based on imaginary surfaces, the Authority expects that the aeronautical studies that FAA would conduct under the FAR Part 77 notification process would not identify safety hazards that would result in FAA recommending the relocation of a proposed communications tower location. The Authority expects that in some cases FAA may recommend some form of mitigation (e.g., attaching specific types of lighting or other visual markings to the communications tower poles), which could be implemented without affecting the location or the function of the communications tower. The Authority would work with the FAA to implement FAA-proposed mitigation measures (if any) for FAR Part 77 notification structures.

CEQA Conclusion

The impact on aviation safety under either project alternative from the construction of structures that exceed height limits within FAR Part 77 imaginary surfaces would be less than significant under CEQA. Project structures (including proposed radio towers) would exceed FAR Part 77 height notification limits for both project alternatives; therefore, notification to FAA would be required. However, such structures will conform to the recommendations of the FAA aeronautical study and aviation safety requirements. The Authority expects that the aeronautical studies that FAA would conduct under the FAR Part 77 notification process would not identify safety hazards that would result in FAA recommending the relocation of a proposed communications tower or other structure location. The Authority expects that in some cases the FAA may recommend some form of mitigation (e.g., attaching specific types of lighting or other visual markings to the communications tower poles), which could be implemented without affecting the location or function of the communications tower. Locations of communications towers and other structures that would be built would therefore not result in a safety hazard for people residing or working in the project vicinity in an area where there is an airport land use plan, and accordingly the impact would be less than significant under CEQA. Therefore, CEQA does not require mitigation.

Impact S&S#12: Temporary Exposure to Valley Fever

Construction activities in San Francisco County, San Mateo County, and Santa Clara County for either project alternative would require grading, excavation, and landscaping that could temporarily disrupt soil containing the fungus that causes Valley fever. Disrupting soil could cause airborne dust, which could be inhaled by construction workers and visitors to the site. The public could be exposed to the fungus that causes Valley fever from off-site transport of fill material on public roads and from fugitive dust outside the boundaries of the construction sites. Inhalation of airborne dust containing the fungus that causes Valley fever could pose a threat to health if a fungal infection is contracted.

Project features prevent the spread of Valley fever during construction by managing fugitive dust emissions through a fugitive dust control plan (AQ-IAMF#1). The fugitive dust control plan will be prepared by the contractor and will describe how each measure in the plan will be employed. As part of the fugitive dust control plan measures, all vehicles transporting construction fill material on public roads will be covered, and trucks and equipment transporting construction fill material will be washed prior to leaving construction work areas and traveling on public roads. Exposed surfaces and unpaved roads in construction areas will be watered as needed to control fugitive dust (AQ-IAMF#1). Application of water for dust control will depend on the weather (e.g., rainfall events) and site conditions. Vehicle travel speeds on unpaved roads in construction areas will be limited. Disturbed areas and on-site and off-site unpaved roads will be stabilized by watering or presoaking disturbed lands, washing exterior surfaces of buildings during demolition, and removing any accumulation of mud or dirt from public streets.

The contractor will prepare an SSMP prior to construction (SS-IAMF#2). The plan will include information on causes, preventive measures, symptoms, and treatments for Valley fever; outreach and coordination with CDPH and county departments to make information on Valley fever readily available to residents, schools, and businesses; and dedication of a qualified person who will oversee the Valley fever prevention measures, including fugitive dust control measures

and construction worker protection measures. A Valley fever health and safety designee will coordinate with the county public health officer to determine what measures will be required by the Authority as part of the SSMP (SS-IAMF#2) to prevent Valley fever exposure. The designee will manage the Valley fever control measures, which will include training workers and supervisors on how to recognize symptoms of illness and ways to minimize exposure; providing washing facilities; providing vehicles with enclosed air-conditioned cabs; equipping heavy equipment cabs with high-efficiency particulate air filters; and making National Institute for Occupational Safety and Health–approved respiratory protection with particulate filters available to workers who request them. Through effective coordination, education, and prevention measures, temporary impacts on construction workers and the public from exposure to Valley fever will be minimized.

CEQA Conclusion

The impact on community safety from exposure of construction workers and the public to Valley fever from temporary ground-disturbing activities and operation of vehicles and equipment on unpaved roads during construction would be less than significant under CEQA because construction activities that could result in exposure to the fungus that leads to Valley fever will be minimized through a fugitive dust control plan (AQ-IAMF#1) and an SSMP (SS-IAMF#1). These plans will include dust control measures to limit the spread of dust that could contain the fungus that leads to Valley fever, outreach and coordination with state and county departments to make information on Valley fever available to the public, and Valley fever prevention measures. Through effective coordination, planning, and implementation of control and prevention measures, project features minimize impacts on the exposure of the public or construction workers to Valley fever and, therefore, project construction would not result in a safety or security hazard or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Impact S&S#13: Temporary Exposure to High-Risk Facilities and High-Risk Utilities

Project construction activities would occur in dense urban areas of San Francisco, San Mateo, and Santa Clara Counties within an existing railway right-of-way. As shown in Table 3.11-7, under Alternative A there are 166 high-risk facilities within 2 miles of the project footprint—3 electric power plants, 110 WWTPs, and 44 active or closed landfills and waste transfer/processing facilities, 7 dams and reservoirs, and 2 fuel terminals. For Alternative B (both viaduct options), there are 168 high-risk facilities within 2 miles of the project footprint. The high-risk facilities under Alternative B are the same as under Alternative A except for 2 additional WWTPs. These high-risk facilities represent a potential hazard to construction of the project.

High-risk utilities within the RSA are identified in Volume 2, Appendix 3.6-A, Table 1. Under Alternative A, there are 260 high-risk utilities in the RSA, of which 200 would be protected in place, 53 would be relocated, and 6 would be extended. The disposition of one other high-risk utility under Alternative A is to be determined. Under Alternative B (Viaduct to I-880), there are 256 high-risk utilities in the RSA, of which 166 would be protected in place, 78 would be relocated, and 11 would be extended; the disposition of one other high-risk utility under Alternative B (Viaduct to I-880) is to be determined. Under Alternative B (Viaduct to Scott Boulevard), there are 249 high-risk utilities in the RSA, of which 157 would be protected in place, 81 would be relocated, and 11 would be extended.

High-risk utilities, including pipelines and other utilities in the project footprint, will be removed, abandoned in place, relocated, or protected in place during construction. The SSMP will include procedures for removal, relocation, or protection of high-risk utilities within the footprint (SS-IAMF#2). Pursuant to utility agreements negotiated between the Authority and the utility service providers, the Authority will work with utility owners during final engineering design and construction of the project alternatives to remove or relocate utilities within the right-of-way or protect them in place within the right-of-way. The contractor will establish a construction safety management plan and SSMP (SS-IAMF#2) that will establish safety guidelines during construction, including procedures for construction activities near identified overhead or underground utility lines. The Authority will conduct a PHA (SS-IAMF#3) that will evaluate the

potential impacts of high-risk facilities and utilities on the project. The Authority's programmatic PHAs will be developed in conformance with the FRA's *Collision Hazard Analysis Guide: Commuter and Intercity Rail Service* (FRA 2007). The SSEP will identify potential hazards from high-risk facilities and utilities within the RSA that will be removed, abandoned in place, relocated, or protected in place during construction and will identify methods to mitigate or eliminate hazards associated with high-risk facilities and utilities (SS-IAMF#2).

CEQA Conclusion

The impact on community safety from exposure to high-risk facilities and utilities during construction would be less than significant under CEQA because the PHA (SS-IAMF#3) will evaluate the potential effects of high-risk facilities and utilities on the project, identify potential hazards associated with high-risk facilities and utilities, and identify measures to minimize hazards prior to construction. The SSMP (SS-IAMF#2) for construction of the project will include measures to minimize potential impacts of high-risk facilities and utilities, including management plans for identifying high-risk facilities and utilities that could be affected by construction and removing, relocating, or protecting in place pipelines, electrical systems, and other buried and overhead high-risk facilities within the project footprint. Accordingly, construction of the project would not result in a safety or security hazard or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Operations Impacts

Operations of the project alternatives would involve scheduled train travel along the HSR tracks through the RSA, as well as inspection and maintenance along the track and railroad right-of-way, at stations, and on structures, fencing, power systems, train control systems, and communications. The DDV alignment would be designed to safely operate at the proposed increased speeds and would therefore have the same safety of HSR operations as Alternative A without the DDV. O&M activities are described in Section 2.8.

Impact S&S#14: Permanent Exposure to Rail-Related Hazards

What does "blended" mean?

Blended refers to integrating the HSR system with existing intercity and commuter and regional rail systems through coordinated infrastructure (blended systems) and scheduling, ticketing, and other means (blended operations).

In this Project Section, HSR, Caltrain, and other (freight) trains would operate mostly in a *blended system*, sharing tracks, an electromotive power system, and signal control system along most of the corridor. Project operations would increase the number, frequency, and speeds of trainsets operating within the Caltrain corridor. PTC for the blended system[18] will monitor and, if necessary, control train movement in the event of operational incidents, improving safety by preventing train-to-train collisions, overspeed derailments, movements through misaligned switches, and incursions through work zones. The Authority would coordinate with Caltrain regarding signaling and the LMF. Additionally, trains within the blended system would have operating speeds of less than 110 mph, rather than the 220-mph operating speeds for HSR trains operating in a dedicated right-of-way, due to design speeds of the corridor and the shared use of the tracks. Operational safety features and maximum travel speeds will minimize the level of safety risk and impact on passengers, employees, and the public. Table 3.11-13 shows the lengths of dedicated track and the lengths of blended track for each project alternative by subsection.

[18] Caltrain's installation of PTC was certified in December 2020. Caltrain will operate and maintain PTC in the Caltrain corridor as part of the blended system.

Table 3.11-13 Blended and Dedicated Track for Each Alternative (miles)

	San Francisco to South San Francisco	San Bruno to San Mateo	San Mateo to Palo Alto	Mountain View to Santa Clara	San Jose Diridon Station Approach	Total
Alternative A						
Blended	10	8	16	9	6.0	49
Dedicated	0	0	0	0	0	0
Total	10	8	16	9	6.0	49
Alternative B[1]						
Blended	10	8	16	9	2.6/0	45.6/43
Dedicated	0	0	0	0	3.3/5.9	3.3/5.9
Total	10	8	16	9	5.9	48.9

Sources: Authority 2019b, 2019c
I- = Interstate
[1] Where they differ, values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard).

The addition of HSR trains in a blended track system in the San Francisco to San Jose rail corridor under both project alternatives is expected to increase the number and frequency of trainsets operating within the blended system. Alternative A contains the longest length of blended track (6 miles more blended track than Alternative B [Viaduct to Scott Boulevard] and 3.4 miles more blended track than Alternative B [Viaduct to I-880]). The greater length of blended track would increase the potential for collisions and derailments and the potential for accidents and incidents involving trains, other objects, and people. HSR and other trains operating in the corridor would be controlled by the same systems that make use of PTC, and would run at lower speeds than in most other HSR project sections because of geometric alignment limitations and shared use of the route. These features would reduce the potential for train-to-train collisions. Lower speeds would also reduce the kinetic energy involved in collisions between trains; freight trains and non-HSR passenger trains would be heavier than HSR trains but also would be traveling at generally slower speeds than HSR trains. Both of these factors would reduce the kinetic energy involved in collisions.

Potential collisions between HSR trains and freight trains in the blended system would be avoided because dispatching would separate freight and passenger trains in time. Freight operation is restricted during the AM and PM peak periods and largely occurs during late evening and night hours. Temporal separation of the HSR trains and freight trains would be regulated by train control systems to avoid freight trains and HSR trains operating at the same time on blended system tracks.

The design and construction of the HSR system will also include an SSMP (SS-IAMF#2) describing the procedures, processes, and programs to support the safety and security goals. These procedures, processes, and programs will include a maintenance, inspection, and repair program for the dedicated HSR facilities; a rules compliance and procedures review program; and an employee and contractor training program that will maintain system safety. Caltrain will continue to maintain the mainline tracks in the Caltrain corridor and the rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules and practices, passenger safety, emergency response, and passenger equipment safety standards found in 49 C.F.R. Parts 200–299.

The contractor will conduct a supplemental PHA and a threat and vulnerability assessment (TVA) to identify potential collision hazards and other facility hazards and vulnerabilities, including security vulnerabilities in rail vehicles, that then could either be eliminated or minimized by the HSR design (SS-IAMF#3). These provisions will apply to the dedicated HSR facilities, including HSR station facilities, the LMF, and dedicated HSR track, but will not apply to the blended system. The dedicated HSR track in the San Jose Diridon Station Approach Subsection under

Alternative B (3.3 miles for Alternative B [Viaduct to I-880] and 5.9 miles for Alternative B [Viaduct to Scott Boulevard]) will include a hazard detection system, where supported by hazard analyses, that will alert the HSR system operating control center of natural events such as seismic activity, excessive wind speeds, high water levels, and excessive ambient temperature levels that could result in conditions that could cause an accident. The hazard detection system will also include systems for detection of trespassers (Authority 2013b).

Within the blended system, Caltrain as the host railroad is responsible for managing and controlling operations to meet safety requirements and HSR would be a tenant. Caltrain currently uses, and the blended system would continue to use, the University of California at Berkeley's Rapid Earthquake Data Integration System to determine the magnitude and location of earthquakes and their possible impact on track and structures. Depending on magnitude and location, earthquakes may require a system response, such as slowing or halting train operations until track inspection and any necessary repairs can be completed. The signal control system, implemented by Caltrain within the Caltrain corridor, would respond to identified incidents. HSR and Caltrain trains would operate on tracks within their safe speed limits, which are defined by both curvature and track rating.

Project operations between San Francisco and San Jose would occur in a partially grade-separated system that has numerous at-grade roadway crossings, which could result in potential conflicts between trains and motor vehicles, pedestrians, and cyclists. Under Alternative A, the HSR would be a blended operation from Scott Boulevard in Santa Clara to West Alma Avenue in San Jose in the San Jose Diridon Station Approach Subsection. Alternative A would have approximately 6.0 miles of blended track within the San Jose Diridon Station Approach Subsection. Under Alternative B (Viaduct to I-880), approximately 2.6 miles of track in the San Jose Diridon Station Approach Subsection would be blended track. Under Alternative B (Viaduct to Scott Boulevard), there would be no blended track in the San Jose Diridon Station Approach Subsection.

The potential for incidents at the at-grade crossings during project operations would be reduced through installation of four-quadrant gates, barriers, and roadway channelization at 40 at-grade crossings for Alternative A and 38 at-grade crossings for Alternative B, where these improvements do not already exist. The project would also complete the perimeter fencing of the Caltrain right-of-way, which would reduce the potential for train conflicts with motor vehicles, pedestrians, and cyclists and discourage trespassing.

The operation of the HSR system in the Caltrain corridor would meet or exceed state and federal safety requirements for train operations for all at-grade crossings. The project would upgrade all existing at-grade rail crossings through the installation of four-quadrant gates (reducing potential vehicle intrusion) and median channelization where not present (also reducing potential vehicle intrusion). Studies (Cooper and Ragland 2012; FRA 2015) have shown that a large portion of accidents that occur at at-grade crossings are due to driver behavior or inattention. FRA estimates that 94 percent of train-vehicle collisions can be attributed to driver behavior or poor judgement (FRA 2015). A 2012 Caltrans study indicated that a key solution to rail crossing crashes is to remove the ability for the driver to engage in a potentially poor decision-making process by making it more difficult for the driver to bypass lowered gates. Median separators and long-arm gates or four-quadrant gates have been shown to reduce the potential for collisions by removing or substantially deterring the ability of vehicles to bypass two-quadrant gates. The addition of a four-quadrant gate system was indicated in one study as providing a reduction of the likelihood of a collision by 82 percent compared to at-grade crossings with only two-quadrant gates (Cooper and Ragland 2012).

Within the Caltrain corridor portion of the Project Section, Caltrain is the host railroad and is responsible for compliance with all applicable state and federal safety regulations in regard to dispatch, at-grade crossings, track conditions and signal operations. Caltrain contracted with Wabtec Corporation to implement the Interoperable Electronic Train Management System

(I-ETMS) PTC solution.[19] This system takes the place of the previously planned Communications Based Overlay Signal System. I-ETMS is a signal system overlay-based solution (Bouchard 2020). Wabtec describes I-ETMS generally as follows (Wabtec n.d.):[20]

- I-ETMS integrates new technology with existing train control and operating systems to enhance train operation and safety.
- I-ETMS prevents track authority violations, speed limit violations, unauthorized entry into work zones, and train movement through a switch left in the wrong position, all of which reduce the potential for train accidents.
- With I-ETMS, the crew remains in control of the train. The system monitors and ensures the crew's compliance with all operating instructions, while the I-ETMS display screen provides the train crew a wealth of operating information.
- As the train moves down the track, the I-ETMS on-board computer, with the aid of an on-board geographic database and global positioning system, continuously calculates warning and braking curves based on all relevant train and track information, including speed, location, movement authority, speed restrictions, work zones, and consist restrictions.
- I-ETMS also communicates with wayside devices checking for broken rails, proper switch alignment, and signal aspects.
- All information is combined and analyzed in real time to provide a safety net for improved train operation.

PCJPB has also identified that the basic wayside systems for preemption (e.g., the systems that provide preemption of local traffic signals when trains are arriving at the at-grade crossings) that are in place now should be assumed to be in place in the future. PCJPB has a policy to implement grade-crossing preemption systems as funding allows. PCJPB also identified that Caltrain has aggressively pursued safety upgrades, including signage, pavement markings, and medians at most vehicular and pedestrian crossings. Caltrain uses a hazard analysis tool that is updated periodically to determine whether a particular crossing will receive upgrades (Bouchard 2020).

The project would modify a number of existing Caltrain stations between the 4th and King Street Station in San Francisco and West Alma Avenue in San Jose (Alternative A) to I-880 (Alternative B [Viaduct to I-880]) or to Scott Boulevard in Santa Clara (Alternative B [Viaduct to Scott Boulevard]) to varying degrees to accommodate HSR trains passing through or stopping at the stations. At the Broadway Caltrain Station (Alternatives A and B) and College Park Caltrain Station (Alternative A only), new northbound outboard platforms would be built to eliminate the need for passengers to board and alight from the train between the active tracks, improving the safety of passengers during train operations and eliminating the hold-out rule requiring oncoming trains to stop outside of the station zone until the passengers are safely clear. The movement of HSR trains through Caltrain stations could introduce new safety concerns for passengers waiting on platforms. Safety improvements will be included as part of the project design to provide warning to passengers to move away from the edge of the platforms prior to approach of HSR and Caltrain trains passing through the stations. These safety improvements could include increasing the width of the tactile platform strips at Caltrain stations, modifying the existing tactile platform strips and providing additional visual and audible warnings of approaching HSR trains. Prior to HSR operations, Caltrain, as the owner and operator of the Caltrain stations, would be responsible for design and implementation of the modifications to station platforms. These modifications would be subject to further review and analysis based on the Authority's ultimate

[19] PTC installation on the Caltrain corridor was completed as of December 2020.

[20] This is a generic description from the Wabtec website; the system features for the Caltrain corridor may vary from those described.

vehicle procurement and would be the subject of future blended system planning and agreement between the Authority and PCJPB.

CEQA Conclusion

The impact on community safety from rail-related hazards, such as train collisions or derailments during operation, would be less than significant under CEQA for both project alternatives because the design of the blended system would include safety elements, maximum travel speeds, and temporal separation between passenger and freight operations to minimize the risk of train-to-train collisions or derailments, collisions between trains and objects, at-grade crossing incidents involving vehicles, pedestrians, or bicyclists, and incidents at stations. These safety elements would include PTC (installed and operated by Caltrain), four-quadrant gates and median barriers at the at-grade crossings, perimeter fencing, safety improvements at the Broadway Station (Alternatives A and B) and College Park Caltrain Station (Alternative A only), and station design and signage. In addition, the project design for the dedicated HSR facilities will include an O&M plan that includes schedules and procedures for the periodic maintenance of the HSR track; right-of-way; power systems; train control systems; and signalizing, communications, and safety systems required for operations of the HSR system. Caltrain will be responsible for O&M of the equipment on the Caltrain tracks and within the Caltrain corridor. The Authority will also prepare hazard and threat vulnerability analyses to identify hazards before operations and plan solutions to eliminate or minimize risks (SS-IAMF#3). Through effective planning and design, risks of accidents will be minimized and, therefore, project operations would not result in a safety or security hazards or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Impact S&S#15: Continuous Permanent Exposure to High-Risk Facilities and Fall Hazards

Project operations would occur in dense urban areas of San Francisco, San Mateo, and Santa Clara Counties within an existing railway right-of-way. As shown in Table 3.11-7, for Alternative A there are 166 high-risk facilities within 2 miles of the project footprint, including 3 electric power plants, 110 WWTPs, and 44 active or closed landfills and waste transfer/processing facilities, 7 dams and reservoirs, and 2 fuel terminals. For Alternative B (both viaduct options), there are 168 high-risk facilities within 2 miles of the project footprint, including 3 electric power plants, 112 WWTPs, and 44 active or closed landfills and waste transfer/processing facilities, 7 dams and reservoirs, and 2 fuel terminals. Based on the number of high-risk facilities within the RSA for Alternative A and Alternative B (both viaduct options), the exposure to high-risk facilities would be similar for Alternative A and Alternative B (both viaduct options).

Propane, bulk fuel, and bulk chemical storage facilities are in industrial areas of the RSA, some of which are adjacent to airports, railroads, and highways within the RSA. These high-risk facilities represent a potential hazard to operations of the project; an incident (e.g., fire, explosion) at a high-risk facility could affect operations. Adherence to regulations such as those cited in Section 3.10.2, Laws, Regulations, and Orders, will govern the transport, storage, and use of such materials toward the safe operation of the LMF.

Tall structures (including bridges, pedestrian bridges, and signal overcrossing structures overarching the track) also represent a potential hazard to operations of the project; a tall structure affected by an incident (e.g., severe weather) could deposit debris in the right-of-way and obstruct operation of trains. Tall structures also have the potential to topple onto HSR facilities, or to affect them because of explosions resulting from accidents, severe weather, or terrorist acts. Table 3.11-8 summarizes the tall structures within the safety and security RSA that could pose safety hazards. Tall structures within the safety and security RSA for Alternative A total 79 structures—44 bridges, 25 signal overcrossings, and 10 other tall structures (e.g., buildings). Tall structures within the safety and security RSA for Alternative B (both viaduct options) total 71 structures—43 bridges, 21 signal overcrossings, and 7 other tall structures. Based on the number of tall structures within the RSA for Alternative A and Alternative B, the exposure to tall structures would be greater under Alternative A than under Alternative B.

Building codes and safety regulations provide for the safe operation of buildings in the RSA. Therefore, the probability is low that a catastrophic industrial accident resulting in substantial off-

site consequences would occur adjacent to the alignment as a train is passing a tall building. There is no available information to indicate that any of these tall structures have undergone a catastrophic failure in the past several decades or a failure that toppled the structure onto a transportation corridor.

Oil and natural gas pipelines within the RSA are public utilities and energy resources and are therefore also identified and discussed in Section 3.6. Oil and natural gas pipelines have the potential to undergo catastrophic failure. A notable failure of a Pacific Gas and Electric Company gas transmission pipeline in San Bruno (outside the RSA) in 2010 resulted in the loss of 8 lives, destruction of 38 homes, and damage to 70 homes in a sustained major fire (National Transportation Safety Board 2011). No other incidents from these facilities, since the 2010 incident, involving explosions or catastrophic failures have resulted in off-site injuries or property damage. Section 3.10 identifies and discusses the PEC sites in the RSA. These PEC sites potentially contain contaminated hazardous materials and may also contain aboveground and below-ground bulk storage tanks or other bulk hazardous material storage on-site. Additional analyses for potential impacts from high-risk PEC sites and oil and natural gas pipelines within the RSA as they relate to the construction and operations of the project alternatives are provided in Section 3.10.

The Authority will develop an SSMP (SS-IAMF#2) for construction of the project will include measures to minimize potential impacts of high-risk facilities, including management plans for locating, removing, relocating, or protecting in place pipelines, electrical systems, and other buried and overhead high-risk facilities within the project footprint. Removal, relocation, or protection in place of high-risk facilities during construction will reduce the potential impact of high-risk facilities on operations by avoiding the risk during operations (by removing the high-risk facility) or reducing the risk during operations (by protecting the high-risk facility in place). The Authority may also develop facility-specific measures to provide additional protection of high-risk facilities or emergency response capability for high-risk facilities based on the results of the PHA (SS-IAMF#3).

CEQA Conclusion

The impact on community safety from exposure to high-risk facilities and tall structures during operations would be less than significant under CEQA for the project alternatives because project features minimize the potential for high-risk facilities, including oil and natural gas pipelines, bulk fuel storage facilities, and tall structures (including bridges, buildings, and industrial plants), to affect operations of the project. The Authority will develop an SSMP (SS-IAMF#2) and conduct a PHA (SS-IAMF#3) that will evaluate the potential effects of high-risk facilities on the project, identify potential hazards associated with high-risk facilities, and minimize hazards prior to operations. Accordingly, project operations would not result in a safety or security hazard or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Impact S&S#16: Continuous Permanent Exposure to Criminal and Terrorist Activity

Criminal activity, such as theft and violence, could occur during operations on trains or at stations under either project alternative. In addition, terrorists could target the HSR tracks, stations, or trains with the intent to inflict mass casualties and disrupt transportation infrastructure. Terrorist incidents involving urban and intercity passenger trains have occurred in the United Kingdom, Spain, Russia, India, and other countries in Europe and Asia. A coordinated terrorist attack on trains and train stations in Madrid in March 2004 resulted in 192 fatalities and more than 2,000 injuries (Aparicio 2004). A coordinated terrorist attack on passenger trains in Central London in July 2005 resulted in 52 fatalities and more than 700 injuries (CNN 2013).

The routes and stations would be similar for Alternative A and Alternative B (both viaduct options), so the potential for exposure to criminal and terrorist activity would also be similar. The location of the LMF would differ for Alternative A (East Brisbane LMF) and Alternative B (West Brisbane LMF), and the passing track would be operated under Alternative B but not under Alternative A. These differences, however, would not lead to heightened exposure to criminal or terrorist activity for either alternative. The number of trains that would be operated and the

number of passengers and crew and other potentially affected persons would be similar for Alternative A and Alternative B.

During the final design of the project, the contractor will perform a TVA to supplement the TVA prepared by the Authority. The TVAs will establish provisions for the deterrence and detection of, as well as the response to, criminal or terrorist acts for HSR facilities and system operations (SS-IAMF#3). Specific construction provisions will include right-of-way fencing, security lighting, security procedures and training, and closed-circuit televisions. The Authority will oversee implementation of the recommendations from the TVA during design and operations to minimize identified threats. These features would be the same under both alternatives, except that under Alternative B, the dedicated portions of track in the San Jose Diridon Station Approach Subsection (3.3 miles for Alternative B [Viaduct to I-880] and 5.9 miles for Alternative B [Viaduct to Scott Boulevard]) would also include intrusion detection systems that could alert the operator to the presence of inert objects, such as debris from tall structures or derailed freight trains that could be caused by terrorist activity, and stop HSR operations to avoid collisions. The intrusion detection system would not be present on the blended portions of track under either alternative. The blended system would comply with FRA safety requirements for the corridor in consideration of the operating speed and track classifications. The train control system and operating systems will reduce the potential for train derailment in the event of an incident. The measures identified by the TVA will minimize vulnerability to criminal and terrorist activity.

System security plans and an SEPP will be developed prior to HSR operations (SS-IAMF#2). These plans address design features and standards and guidelines to maintain security at the stations and LMF, within the track right-of-way, and on trains. The SEPP will address TSA and Department of Homeland Security requirements for operation of railroads, including potential terrorist threats. The Authority will designate a primary and an alternate security coordinator and will provide the TSA with names and contact information for 24-hour/7-days-per-week availability. The security coordinator will have a direct reporting relationship to the Authority chief executive officer regarding matters of rail operations security.

The Authority has established a liaison with the TSA Mass Transit and Rail Department who reports directly to the project operations manager. This liaison has been established to meet all Department of Homeland Security and TSA requirements once the project is complete and to provide coordinated transfer of information concerning security concerns, threats, best practices, and security regulations that may affect rail security during development and implementation of the HSR system and during operations of the project (Authority 2013b).

Construction design standards and HSR operating systems and procedures include provisions to reduce the potential for, and the impacts of, terrorism incidents and criminal activity. The design standards and guidelines for construction of the project require emergency walkways on both sides of the tracks for both elevated and at-grade sections. Adequate space would be present along at-grade sections of the alignment to allow emergency response access and evacuation in the event of a criminal or terrorist act. Ground access would be available for elevated tracks where access to ground equipment is required. Additional ground access would be considered, consistent with fire and rescue procedures. The entire project would be access-controlled with only authorized persons permitted access to the HSR right-of-way, HSR facilities, and nonpublic areas of stations. These systems would facilitate efficient evacuation of train passengers and employees in the event of a terrorism incident and would help deter criminal activity and prevent suicide attempts by deterring and increasing the difficulty for unauthorized persons entering the HSR right-of-way.

CEQA Conclusion

The impact on safety from criminal or terrorist activity during operations would be less than significant under CEQA for the project alternatives because criminal or terrorist acts that could increase exposure to safety risks would be minimized through deterrence and detection systems and TVAs (SS-IAMF#3). Design standards and guidelines allow emergency response access and evacuation in the event of a criminal or terrorist act. Through effective planning, coordination, and project features to minimize the risk for criminal and terrorist acts and provide safe procedures

during operations, the project would not result in a safety or security hazard or cause an increased demand on emergency services. Therefore, CEQA does not require any mitigation.

Impact S&S#17: Continuous Permanent Safety Hazards to Schools

If a train accident occurred during project operations, including a train derailment during a seismic event or natural disaster, a substantial safety hazard to schools could occur if the train left the HSR right-of-way and collided with other structures, including schools, or people on adjacent properties. The hazards to schools would include the train or train components colliding with a school structure or people in occupied areas of school property, which could only occur adjacent to the right-of-way and could only occur if the train or train components left the guideway because of a derailment incident. As presented in Table 3.11-11, there are 66 public and private schools/childcare facilities in the schools RSA for both Alternative A and Alternative B (both viaduct options).

HSR derailments in France (2015) and China (2011) were caused by excessive train speed resulting from late braking application and flawed control systems and signaling design and software (SNCF 2015). In these cases, neither HSR system was equipped with a PTC system, which is designed to protect against overspeed derailment (BBC News 2011; Ning et al. 2011; Lau 2013; Yam 2013). Within the Project Section, the signal train control system would, if necessary, control train movement in the event of operational incidents, improving safety by preventing train-to-train collisions, overspeed derailments, movements through misaligned switches, and incursions through work zones. This signal train control system will comply with the FRA-mandated PTC requirements and will reduce the potential for derailments, thereby reducing the potential for trains or parts thereof to affect a school structure. The signal train control system and inspection and maintenance programs will reduce the potential for derailments and thereby reduce the potential for derailed trains to affect a school structure. Additionally, the Authority will conduct a PHA (SS-IAMF#3) that will identify potential derailment hazards and will apply measures to reduce the potential incidence and consequences of derailments, including design features (e.g., barriers) to minimize the potential for a derailed train to leave the guideway and affect school structures or individuals outside the right-of-way. In addition to these safety elements, which would be common to both alternatives, the dedicated portions of track in the San Jose Diridon Station Approach Subsection under Alternative B (3.3 miles for Alternative B [Viaduct to I-880] and 5.9 miles for Alternative B [Viaduct to Scott Boulevard]) would also include an intrusion detection system that would detect the presence of trespassers or objects on the HSR tracks. The intrusion detection system would not be present on the blended portions of track under either alternative. The blended system would comply with FRA safety requirements for the corridor in consideration of the operating speed and track classifications.

CEQA Conclusion

The impact of project operations on school safety would be less than significant under CEQA because operational conditions that could result in derailment and safety hazards for schools would be effectively minimized through safety elements incorporated into the project design. Safety elements include a signal train control system and inspection and maintenance programs that minimize the risk of accidents. Through incorporation of safety elements into project design, project features minimize the risk of accidents and, accordingly, operations of the project would not result in a safety hazard for schools. Therefore, CEQA does not require any mitigation.

3.11.6.4 Wildfire Hazards

The potential for wildland fires represents a hazard where development is adjacent to open space or near wildland fuels or designated fire hazard severity zones. New development located in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area must comply with Gov. Code Section 65302 minimum requirements for building materials and construction methods to improve exterior wildfire exposure protection. Potential impacts include exposing people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

No Project Impacts

The conditions under the No Project Alternative are the same as those described in Section 3.11.6.2. Under the No Project Alternative, existing designated fire hazard severity zones within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area would not change. The population in San Francisco, San Mateo, and Santa Clara Counties is projected to increase through 2040. Development projects to accommodate projected population and employment growth would continue under the No Project Alternative. All new development would need to comply with Gov. Code Section 65302 minimum requirements for building materials and construction methods to improve exterior wildfire exposure protection and could result in direct and indirect impacts on safety and security, including exacerbating wildfire risks depending on the location and nature of the development.

Project Impacts

Impact S&S#18: Temporary Exposure to Wildfire Hazards

CAL FIRE provides wildfire hazard potential ratings for California. Within the counties where the alternatives are situated, a few locations have wildfire hazard potentials that range from moderate to high (CAL FIRE 2007a, 2007b, 2007c, 2008a, 2008b). There are moderate to high wildfire hazard severity zones in the City and County of San Francisco and San Mateo County. These areas are at Bayview Park in southern San Francisco and San Bruno Mountain in San Mateo County. However, these areas are not crossed by either of the project alternatives. Within Santa Clara County, there are no fire hazard severity zones within or in proximity to the project footprint. Because the project alternatives would not be built in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area, the risk of wildfire hazard would be minimal.

The risk of fire would not be elevated during construction because all construction activities would comply with all required and recommended fire safety measures as per Cal. Public Res. Code Title 14 and Title 19, and alignments would be built in accordance with all requirements established by local jurisdictions and all other applicable fire code regulations.

CEQA Conclusion

The impact would be less than significant under CEQA because the project alternatives would not be built in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area, and the risk of fires during construction would be minimized. During construction activities, all required and recommended fire safety measures would be implemented, as per Cal. Public Res. Code Title 14 and Title 19. In addition, alignments would be built in accordance with all requirements established by local jurisdictions and all other applicable fire code regulations. With implementation of these requirements, construction of the project would not be expected to expose people or structures to a significant wildfire risk and would not elevate wildfire risks. Construction-related activities would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. Therefore, CEQA does not require mitigation.

Impact S&S#19: Permanent Exposure to Wildfire Hazards

The project alternatives would not operate in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area; therefore, the risk of wildfire hazard during operation would be minimal. During operations, given the lack of combustible fuels and low volume of flammable materials associated with operations of an HSR system and project design, the permanent exposure of the public, passengers, or employees to wildfire hazards, including wildland fires, would be minimized.

The Authority will develop and incorporate fire and life safety programs into the design, construction, and operations of the project (SS-IAMF#2). The Authority will form a statewide Fire

and Life Safety and Security Committee (FLSSC) composed of representatives from fire, police, and local building code agencies (Authority 2013b). The purpose of the FLSSC will be to review issues that are critical to fire and life safety and security, to acquire input and concurrence from the state and local authorities having jurisdiction over the proposed designs to meet code requirements, and to comply with state and local fire code standards or fire/life safety hazard mitigation measures during the design phase. The fire and life safety program will include regional FLSSCs that will focus on the fire and life safety characteristics specific to each HSR project section, including underground and elevated structures, access methods, terminals, and maintenance facilities, to provide input on local building codes or requirements that are in line with the emergency response characteristics and capabilities of the local agencies. Representation and operation of the statewide FLSSC and regional FLSSCs will be coordinated with local emergency response organizations to provide an understanding of the HSR system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities. These programs and coordination activities will allow rapid response by local emergency responders in case of an accident, reducing the potential for uncontrolled wildfire events.

Operations of both project alternatives would include elements (e.g., HSR electrical systems, stations, LMF, railbeds) that could increase the potential for wildfires and wildland fires. Although HSR trains would not carry fuel or large quantities of flammable materials, there would be an inherent fire hazard during operations from electrical systems. With the fire and life safety programs and the FLSSC, this risk would be controlled and minimized.

CEQA Conclusion

The impact would be less than significant under CEQA because the project alternatives would not be operated in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area, and the risk of fires during operations would be minimized. With the fire and life safety programs and the FLSSC, this risk would be effectively minimized and the operations of the project would not elevate fire or wildfire risks or expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving fire or wildland fires. Therefore, the incremental increase in fire hazard from project operations would be minimized under both project alternatives. Therefore, CEQA does not require mitigation.

3.11.7 Mitigation Measures

There would be a significant impact under CEQA for both project alternatives on emergency vehicle response times due to project construction and operations, and for Alternative B only on emergency vehicle access to and from the Brisbane Fire Station. These would be both temporary impacts during construction and permanent impacts during operations. SS-MM#1 through SS-MM#4 (Table 3.11-14) will address these impacts. These mitigation measures would be the same under both project alternatives except for SS-MM#1 and SS-MM#2, which would apply only to Alternative B.

Table 3.11-14 Safety and Security Mitigation Measures

Mitigation Measure	Alternative A	Alternative B
SS-MM#1: Construction Traffic Management for Passing Track Section		X
SS-MM#2: Modify Driveway Access Control for Relocated Brisbane Fire Station		X
SS-MM#3: Install Emergency Vehicle Priority Treatments near HSR Stations	X	X
SS-MM#4: Install Emergency Vehicle Priority Treatments Related to Increased Gate-Down Time Impacts	X	X

In addition to the four safety and security mitigation measures, TR-MM#1: Potential Mitigation Measures Available to Address Traffic Delays (NEPA Effect Only), will help to reduce impacts on emergency access and response times. Section 3.2.7, Mitigation Measures, provides a full description of this mitigation measure (including its subcomponents).

SS-MM#1: Construction Traffic Management for Passing Track Section

Prior to construction of Alternative B, the Authority's contractor will develop a construction staging plan for the passing track to prevent simultaneous temporary closures of adjacent at-grade undercrossings. Nine undercrossings will be modified in the passing track section under Alternative B.

During construction of Alternative B, the Authority's contractor will prohibit the delivery of construction materials to the modified roadways in the passing track area between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to reduce impacts on traffic.

SS-MM#2: Modify Driveway Access Control for Relocated Brisbane Fire Station (Alternative B)

Prior to construction of the relocated Tunnel Avenue overpass under Alternative B, the Authority's contractor will develop a modified driveway access control plan for the Relocated Brisbane Fire Station (Alternative B). The fire station will be relocated approximately 150 feet to the south of the existing fire station, with a driveway connecting to Bayshore Boulevard via the existing station's secondary driveway, a mid-block location that provides right-in, right-out access to northbound Bayshore Boulevard and non-exclusive access to the new Tunnel Avenue/Bayshore Boulevard intersection. The modified driveway access control plan will provide for the installation of a new mid-block signalized intersection (i.e., signal only for the fire station driveway) at the secondary driveway on Bayshore Boulevard between signalized intersections at Valley Drive and Old County Drive. In addition, median modifications at the new mid-block intersection will provide a break in the raised median to allow fire truck movements and a short southbound left-turn pocket where inbound fire trucks could wait for the fire station signal to be triggered. The contractor will prepare all materials necessary for and obtain the approval of the City of Brisbane for this improvement.

This mitigation measure will be effective in maintaining existing emergency vehicle response times for the Relocated Brisbane Fire Station (Alternative B). SS-MM#2 would not result in secondary impacts because the driveway access control modifications would be located within existing developed public rights-of-way.

SS-MM#3: Install Emergency Vehicle Priority Treatments near HSR Stations

Prior to construction, to mitigate fire station emergency access and response time impacts related to the 4th and King Street Station, the Authority's contractor will develop an emergency vehicle priority plan and install emergency vehicle priority treatments and new traffic control devices as needed for San Francisco Fire Station 8. It is anticipated that this may include installation of a new traffic signal for fire station access at the intersection of either Fourth Street/Bluxome Street or Fifth Street/Bluxome Street, as well as emergency vehicle priority treatments where they do not exist along Fifth Street between Townsend Street and Bryant Street and along Fourth Street between Channel Street and Bryant Street. The contractor will prepare all materials necessary for and obtain the approval of the City and County of San Francisco for these emergency vehicle priority treatments. This mitigation measure will be effective in minimizing impacts on emergency response time.

Prior to construction and to mitigate fire station/first responder response time impacts related to added traffic from the Millbrae Station, the Authority's contractor will develop an emergency vehicle priority plan and install emergency vehicle priority treatments as needed for Millbrae Fire Station 37. It is anticipated that this will include installation of emergency vehicle priority treatments where they do not exist along El Camino Real between Millwood Drive in Millbrae and Broadway in Burlingame. The contractor will prepare all materials necessary for and obtain the approval of the City of Millbrae and City of Burlingame for these emergency vehicle priority treatments. This mitigation measure will be effective in minimizing impacts on emergency response time.

Prior to construction and to mitigate fire station emergency access and response time impacts related to the San Jose Diridon Station, the Authority's contractor will develop an emergency vehicle priority plan and install emergency vehicle priority treatments and new traffic control devices as needed for San Jose Fire Station 30. It is anticipated that this may include installation of emergency vehicle priority treatments where they do not exist along Bird Avenue between Park Avenue and West Virginia Street. This mitigation measure will only apply to areas of San Jose affected by the project where EVP is not already in place. The contractor will prepare all materials necessary for and obtain the approval of the City of San Jose for these emergency vehicle priority treatments. This mitigation measure will be effective in minimizing impacts on emergency response time.

SS-MM#3 would not result in secondary impacts because the emergency vehicle priority treatments would be located within existing developed public rights-of-way.

SS-MM#4: Install Emergency Vehicle Priority Treatments Related to Increased Gate-Down Time Impacts

Prior to operations that are expected to result in an exceedance of the 30-second delay threshold, to mitigate fire station/first responder emergency access impacts related to added travel time from increased gate-down time at the at-grade crossings, the Authority will conduct monitoring and implement phased emergency vehicle priority treatment strategies. Where impacts are identified based on monitoring or predicted to occur due to planned HSR service increases, the Authority will develop an emergency vehicle priority treatment plan in conjunction with local agencies. The Authority will make a fair share contribution towards emergency vehicle priority treatments, including local cities, local fire departments, and local first responders. The Authority's fair share contribution will take the form of providing capital funds for project implementation to local agencies, who will be responsible for implementation of capital improvements as well as ongoing O&M of any facilities constructed.

Monitoring will involve collecting travel time data for a 1-mile section (i.e., 0.5 mile on either side of the at-grade crossing) of the at-grade crossing street. The data will be collected during weekday peak periods (7 a.m. to 9 a.m. and 4 p.m. to 6 p.m.). The data will be collected on 12 days during each monitoring year from Tuesday to Thursday over a 2-week period in early May and early October.

Travel time data will be collected at the following intervals:

- 1 year prior to and after addition of Caltrain service with the Caltrain Electrification project (i.e., planned additional one peak-hour round trip), to determine if the addition of initial HSR train service (i.e., planned two peak-hour round trips) is likely to require development and implementation of emergency response priority treatments at any of the eight at-grade crossing locations prior to initiation of initial HSR service
- 1 year prior to initiation of new HSR service to establish baseline emergency response travel times for each corridor
- Monthly for the first 6 months of initial operations[21] and annually thereafter for 3 years
- Starting approximately 6 months after initiation of any subsequent increase in new HSR service, and annually thereafter for 3 years

[21] Initial HSR operations would be more limited in scope than full operations expected by 2040. Chapter 2 identifies that initial operations would include a maximum of two trains per peak hour per direction, which corresponds to up to four one-way trains per hour or every 15 minutes on average, which would have much less effect on emergency vehicle response times than full Phase I operations. With full Phase I operations, the project would have up to four trains per peak hour per direction, which corresponds to up to eight one-way trains per hour on average at full service by 2040. The intent of monitoring initial operations is to identify the potential need for emergency vehicle response time improvements early enough to be in place prior to full operations.

Travel time data will be collected at the following at-grade crossing locations:

1. Oak Grove Avenue (Burlingame)
2. North Lane (Burlingame)
3. Howard Avenue (Burlingame)
4. Whipple Avenue (Redwood City)
5. Brewster Avenue (Redwood City)
6. Broadway (Redwood City)
7. Ravenswood Avenue (Menlo Park)
8. Rengstorff Avenue (Mountain View)

An emergency vehicle priority treatment plan will be developed for at-grade crossing locations where an increase in emergency response times of 30 seconds or more above baseline travel time due to HSR service occurs after initiation of HSR service. The performance standard for the plan is to reduce the response time increases resulting from HSR train operation effects on gate-down time to less than 30 seconds. If initial operations do not result in exceedance of the 30-second threshold, then, using monitoring data for initial operations, the Authority will evaluate whether future planned HSR service increases are likely to result in new or additional delays above the 30-second threshold. If such effects are predicted for planned HSR service increases, then the Authority will develop the emergency vehicle priority treatment plan to account for those effects and will coordinate with local cities, fire departments, and first responders to implement the appropriate treatments prior to the planned HSR service increases that would result in exceedance of the 30-second threshold.

Emergency vehicle priority treatment strategies may include building improvements to streets parallel to the HSR corridor in order to speed travel to adjacent grade-separated crossings of the rail line or to provide new emergency service facilities (i.e., new fire stations or ambulance/paramedic staging facilities) on the opposite side of the corridor where there are no adjacent grade-separated crossings. The strategies may include, but are not limited to, the following:

- Emergency vehicle preemption equipment at traffic signals
- Route-based traffic signal priority control systems
- Emergency vehicle and transit queue bypass lanes
- Roadway capacity and operational improvements to facilities paralleling the rail line to improve access to adjacent grade-separated rail crossings
- Construction of new fire stations to reduce fire station response times in affected areas
- Provision of additional equipment for existing fire stations to expand the capacity of existing fire stations to respond to multiple emergency calls in affected areas
- Increase the contracted first responder ambulance services to reduce first responder ambulance response times in affected areas

As an alternative to the listed strategies, the Authority and a local agency may reach a mutual agreement to have the Authority make an in-lieu payment towards other infrastructure projects including nearby grade-separation projects. The in-lieu payment will be the capital contribution that the Authority would have otherwise made to one or more of the above emergency vehicle priority treatment strategies.

Planned grade-separation projects at Ravenswood Avenue in Menlo Park and Rengstorff Avenue in Mountain View would mitigate impacts on emergency access and response time at these at-grade crossings. These two grade-separation projects are, however, being planned by local agencies, and therefore their implementation is beyond the control of the Authority. Mitigation measures in Menlo Park would not be required if the planned Ravenswood Avenue rail grade-separation project is built prior to implementation of full HSR service. Similarly, mitigation

measures would not be required in Mountain View if the planned Rengstorff Avenue rail grade-separation project is built prior to implementation of full HSR service.

This mitigation measure will be effective in improving emergency vehicle response times by providing funding for emergency vehicle priority treatments. This mitigation measure may not mitigate certain fire station emergency vehicle response times impacts if the determined emergency vehicle priority treatment improvements were to include new construction and one of the affected cities chose not to implement and operate determined emergency vehicle priority treatments using construction funds provided by the Authority. As such, these impacts are considered significant and unavoidable.

Building new fire stations or other emergency vehicle priority improvements may result in secondary impacts depending on their locations, which are presently not known. If local agencies choose to implement and operate emergency vehicle priority treatments with funding provided by the Authority, they may need to conduct environmental analysis prior to construction. Providing additional contracted emergency first responder ambulance services may result in secondary impacts, depending on whether contracted ambulance services would need to construct new deployment facilities or whether their operations would only include deployment of additional ambulances on call in the affected areas. Local agencies may need to conduct environmental analysis prior to construction. If the Authority and a local agency mutually agree for payment of an in-lieu fee used for other infrastructure projects, including grade-separation projects, the local agency may need to conduct environmental analysis prior to construction.

If cities choose not to implement and operate emergency vehicle priority treatments using construction funds provided by the Authority, impacts would be considered significant and unavoidable. In that case, some of the site-specific traffic mitigation measures identified in Section 3.2.7 would be required to help reduce traffic congestion and delays at intersections adjacent or near at-grade crossings during peak hours at certain intersections where the project would affect emergency vehicle response times due to increased gate-down time. The following traffic mitigation measures will help to reduce peak-hour traffic delays at intersections adjacent to or near at-grade crossings with significant emergency vehicle response time delays:[22]

- TR-MM#1a.2: North Lane/California Drive—Install Traffic Signal
- TR-MM#1a.3: North Lane/Carolan Avenue—Install Traffic Signal
- TR-MM#1a.5: Brewster Avenue/Perry Street—Install Traffic Signal
- TR-MM#1h: Whipple Avenue/El Camino Real—Add Overlap Signal Phase and Optimize Signal Timing
- TR MM#1i: Whipple Avenue/Arguello Street—Optimize Signal Timing

The secondary effects of these measures are discussed in Section 3.2.7, Mitigation Measures. As discussed therein and in Volume 2, Appendix 3.2-C, none of the proposed traffic mitigation measures would result in unmitigable secondary environmental effects.

Although these traffic mitigation measures will help to address traffic delays at adjacent or nearby intersections, they will not change gate-down times. As such, if cities choose not to implement and operate emergency vehicle priority treatments using construction funds provided by the Authority, then the impact would remain significant and unavoidable.

3.11.8 Impact Summary for NEPA Comparison of Alternatives

As described in Section 3.1.5.4, the effects of project actions under NEPA are compared to the No Project condition when evaluating the impact of the project on the resource. The determination of effect is based on the context and intensity of the change that would be generated by construction and operation of the project. Table 3.11-15 compares the project impacts by alternative. It is followed by a summary of the impacts.

[22] As described in Section 3.2, signalized locations that are adjacent to at-grade crossings would also be provided with signal preemption.

Table 3.11-15 Comparison of Project Alternative Impacts for Safety and Security

Impacts	Alternative A	Alternative B
Emergency Response and Services		
Impact S&S#1: Temporary Impacts on Emergency Access and Response Times from Temporary Road Closures, Relocations, and Modifications	Construction activity would temporarily close and relocate roads, resulting in detours with the potential to delay emergency vehicle access and increase response times.	Construction activity under Alternative B would result in more temporary road closures than Alternative A because construction of the passing track and viaduct options would require construction affecting more roadways. Alternative B (Viaduct to I-880) would have less construction-period disruption than Alternative B (Viaduct to Scott Boulevard) due to less roadway work. Delays in emergency vehicle access and increases in response times under Alternative B would occur as a result of detours and would be greater than those experienced under Alternative A.
Impact S&S#2: Temporary Impacts on Emergency Access and Response Times from Construction Vehicles	Project features manage construction vehicle traffic and the project would not affect emergency vehicle access and response.	Same as Alternative A
Impact S&S#3: Permanent Impacts on Emergency Access and Response Times Caused by Construction	The permanent relocation and realignment of the Tunnel Avenue overpass and Relocated Brisbane Fire Station (Alternative A) would provide equivalent emergency vehicle access to existing conditions and would not add delay to response times or other performance objectives. Other road closures associated with construction would not affect emergency response times.	The permanent relocation and realignment of the Tunnel Avenue overpass would remove exclusive access for the Relocated Brisbane Fire Station (Alternative B) to the signalized Bayshore Boulevard/Valley Drive intersection and replace it with a driveway that would have unsignalized right-in, right-out access to Bayshore Boulevard and a driveway with non-exclusive access to the new Tunnel Avenue/Bayshore Boulevard intersection, such that additional delay for exiting fire trucks and delays in response times for fire trucks exiting the Relocated Brisbane Fire Station (Alternative B) would occur. However, SS-MM#2 will provide a new exclusive mid-block intersection for the Relocated Brisbane Fire Station (Alternative B), which will address this delay.

Impacts	Alternative A	Alternative B
Impact S&S#4: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities	There would be no need for expansion of existing fire, rescue, and emergency service facilities because the project would include effective measures to minimize the incidence and potential consequences of incidents to which local emergency responders could be required to respond.	Same as Alternative A
Impact S&S#5: Continuous Permanent Direct Impacts on Emergency Access and Response Time Related to the HSR System	The project would not introduce new elevated viaducts or additional lengths of tunnel that would limit access of emergency service provided to the right-of-way, stations, or the Brisbane LMF in the event of an incident. Project design features include emergency operating procedures, SSP, SEPP, a fire and life safety program, and coordination with local emergency response providers, which minimize potential impacts on emergency access by providing coordinated access to access-controlled areas and emergency operating procedures in the event of an emergency or evacuation.	While Alternative B would introduce new elevated viaducts, these would not limit access of emergency service provided to the right-of-way, stations, or the Brisbane LMF in the event of an incident. Otherwise, same as Alternative A.
Impact S&S#6: Continuous Permanent Impacts on Emergency Access and Response Times Due to Station Traffic and Increased Gate-Down Time	The additional traffic at the 4th and King Street Station, the Millbrae Station, and the San Jose Diridon Station would result in potential delays in emergency vehicle response times for fire stations/first responders. The increase in gate-down time from added HSR trains would result in potential delays in emergency vehicle response times for fire stations/first responders in San Francisco, Millbrae, Burlingame, Redwood City, Menlo Park, Palo Alto, and Mountain View.	Same as Alternative A
Community Safety and Security		
Impact S&S#7: Temporary Exposure to Criminal Activity at Construction Sites	Construction sites would not lead to criminal activity risks that would interfere with emergency services. The risk of injury arising from exposure to hazardous machinery or materials or an emergency during criminal activity or emergency service support being required on construction sites will be minimized by storing equipment and materials in secured areas and using security personnel and security lighting to monitor equipment after work hours.	Same as Alternative A

Impacts	Alternative A	Alternative B
Impact S&S#8: Temporary Exposure to Construction Site Hazards	Construction equipment, construction activities, and high-risk facilities would not lead to safety hazards. The project will comply with all legal requirements and include an SSMP to reduce the potential of construction site hazards and accidents.	Same as Alternative A
Impact S&S#9: Temporary Exposure to Construction-Related Traffic Hazards	Alternative A would require fewer temporary roadway and lane closures than would Alternative B (both viaduct options). Temporary road closures and detours that could result in an increased exposure of motor vehicle drivers, pedestrians, and bicyclists to traffic hazards will be minimized through coordination with local jurisdictions, emergency vehicle access procedures and a traffic control plan, staggered road closures, and vehicle and bicycle traffic and pedestrian safety project features.	Alternative B would require more temporary roadway and lane closures because of the additional track and station modifications associated with construction of the passing track and viaducts. As a result, the risk to safety from potential temporary exposure to traffic hazards from temporary roadway and lane closures would be greater under Alternative B (both viaduct options) than Alternative A. Alternative B (Viaduct to I-880) would have less construction-period disruption than Alternative B (Viaduct to Scott Boulevard) due to less roadway work. Increased exposure of motor vehicle drivers, pedestrians, and bicyclists to traffic hazards would be minimized in the same manner as Alternative A.
Impact S&S#10: Permanent Exposure to Traffic Hazards	One permanent road closure (Serra Avenue) would be required for Alternative A. The project would include roadway modifications that will improve traffic flow and safety improvements to reduce traffic hazards by minimizing the potential for conflicts between trains and motor vehicles, pedestrians, and bicycles, resulting in a beneficial effect on community safety.	Five permanent road closures would be required for Alternative B (Viaduct to I-880) and four permanent road closures would be required for Alternative B (Viaduct to Scott Boulevard). Potential permanent exposure to traffic hazards from permanent road closures would be greater for Alternative B (both viaduct options) than for Alternative A. Improvements to traffic flow and safety that would reduce traffic hazards would be achieved in the same manner as Alternative A.

Impacts	Alternative A	Alternative B
Impact S&S#11: Permanent Interference with Airport Safety	Project structures, including 11 proposed radio towers, would exceed FAR Part 77 imaginary surfaces and therefore notification to FAA would be required for these structures. The Authority expects the aeronautical studies that FAA would conduct under the FAR Part 77 notification process would not identify any safety hazards that would result in FAA recommending the relocation of a proposed communications radio tower. The Authority expects that in some cases the FAA may recommend some form of mitigation (e.g., attaching specific types of lighting or other visual markings to the communications tower poles), which could be implemented without affecting the location or the function of the communications tower. The Authority will work with the FAA to implement FAA-proposed mitigation measures (if any) for FAR Part 77 notification structures.	Same as Alternative A
Impact S&S#12: Temporary Exposure to Valley Fever	Construction would not lead to increased risk of exposure to Valley fever. The fugitive dust control plan and SSMP minimize the exposure of the public or construction workers to Valley fever.	Same as Alternative A
Impact S&S#13: Temporary Exposure to High-Risk Facilities and High-Risk Utilities	There are 166 high-risk facilities within 2 miles of the project footprint, as well as 146 high-risk utilities (i.e., including electrical lines, potable water lines, stormwater lines, and petroleum or natural gas lines) within the RSA. Of the 260 high-risk utilities, 200 would be protected in place, 53 would be relocated, and 6 would be extended. The disposition of one other high-risk utility for Alternative A would be determined prior to construction. The SSMP will identify high-risk facilities that could be affected by construction and would include procedures to remove, relocate, or protect in place pipelines, electrical systems, and other buried and overhead high-risk facilities within the project footprint.	There are 168 high-risk facilities within 2 miles of the project footprint under Alternative B (both viaduct options). There would be 256 high-risk utilities within the RSA for Alternative B (Viaduct to I-880), of which 166 would be protected in place, 78 would be relocated, 11 would be extended, and the disposition of 1 utility would be determined prior to construction. There would be 249 high-risk utilities within the RSA for Alternative B (Viaduct to Scott Boulevard), of which 157 would be protected in place, 81 would be relocated, and 11 would be extended. Project features will minimize potential impacts of high-risk facilities and utilities in the same manner as Alternative A. .

Impacts	Alternative A	Alternative B
Impact S&S#14: Permanent Exposure to Rail-Related Hazards	The project would increase the number, frequency, and speeds of trainsets operating within the Caltrain corridor. Alternative A would involve greater operation of the trains on 49 miles of blended track and would include 40 at-grade crossings. This would result in potentially slightly greater exposure to rail-related hazards for Alternative A than for Alternative B (both viaduct options). However, project features include safety elements, including an intrusion detection system for dedicated HSR facilities, to maximize operational safety and minimize the potential for train-to-train collisions or derailments, collisions between trains and objects, and at-grade crossing incidents involving vehicles, pedestrians, or bicyclists.	Alternative B would operate on blended system track within the Caltrain corridor for a shorter distance than Alternative A. Alternative B (Viaduct to I-880) would involve operation of trains on 45.6 miles of blended track, while Alternative B (Viaduct to Scott Boulevard) would involve operation of trains on 43 miles of blended track. Alternative B (both viaduct options) would include 38 at-grade crossings. This would result in potentially slightly lower exposure to rail-related hazards for Alternative B (both viaduct options) than Alternative A. Project features will include the same safety elements as Alternative A, and will also include an intrusion detection system for the dedicated HSR track in the San Jose Diridon Station Approach Subsection.
Impact S&S#15: Continuous Permanent Exposure to High-Risk Facilities and Fall Hazards	There would be 166 high-risk facilities within 2 miles of the project footprint and 79 tall structures within the RSA after completion of construction that could pose hazards to project operations for Alternative A. Based on the number of high-risk facilities and tall structures, the exposure to high-risk facilities would be approximately the same for both alternatives, while the exposure to tall structures would be greater for Alternative A than Alternative B. The Authority will conduct a PHA and develop the SSMP to minimize the potential for exposure to high-risk facilities and tall structures including bridges.	For Alternative B (both viaduct options), there would be 168 high-risk facilities and 71 tall structures within the RSA after completion of construction that could pose hazards to project operations. Based on the number of high-risk facilities and tall structures, the exposure to high-risk facilities would be approximately the same for both project alternatives, while the exposure to tall structures would be less for Alternative B (both viaduct options) than Alternative A. As with Alternative A, the Authority will conduct a PHA and develop the SSMP to minimize the potential for exposure to high-risk facilities and tall structures including bridges.
Impact S&S#16: Continuous Permanent Exposure to Criminal and Terrorist Activity	The location of the LMF would not lead to heightened exposure to criminal or terrorist activity for this alternative. Operations would not lead to increased exposure to criminal or terrorist activity. A system security plan and SEPP developed prior to commencing operations will address deterrence and detection systems, and design standards and guidelines to accommodate emergency response access and provide for safe evacuation in the event of a criminal or terrorist act.	Similar to Alternative A. Differences between the project alternatives would not lead to heightened exposure to criminal or terrorist activity.
Impact S&S#17: Continuous Permanent Safety Hazards to Schools	The signal train control system, inspection and maintenance programs, and intrusion detection systems for dedicated HSR facilities would minimize the safety risk at the 66 schools in the RSA for Alternative A.	Safety elements would be similar to Alternative A and would also include an intrusion detection system for the dedicated HSR track in the San Jose Diridon Station Approach Subsection.

Impacts	Alternative A	Alternative B
Wildfire Hazards		
Impact S&S#18: Temporary Exposure to Wildfire Hazards	Alternatives would not be built in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area. The risk of fire would not be elevated during construction because all construction activities would comply with required and recommended fire safety measures as per California Public Resources Code Title 14 and Title 19 and alignments would be built in accordance with all requirements established by local jurisdictions and all other applicable fire code regulations.	Same as Alternative A
Impact S&S#19: Permanent Exposure to Wildfire Hazards	Alternative A would not be operated in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area. The risk of fires during operations would be further minimized with the low use of flammable materials, and risks that could result in fire safety hazards would be effectively minimized through fire and life safety programs during operations of the project.	Same as Alternative A

FAA = Federal Aviation Administration
FAR = Federal Aviation Regulation
HSR = high-speed rail
I- = Interstate
LMF = light maintenance facility
NEPA = National Environmental Policy Act
PHA = preliminary hazard analysis
PTC = positive train control
RSA = resource study area
SEPP = security and emergency preparedness plan
SSMP = safety and security management plan
SSP = system safety program

Emergency Services and Response

Construction of both alternatives would result in temporary road closures, relocations, and modifications. The extent of such closures (and thus related impacts on emergency services and response) would be greater under Alternative B due to the additional temporary road and lane closures associated with construction of the passing track and viaduct. These temporary closures would result in increases to emergency response times and emergency evacuation times, and the exceedance of performance objectives of emergency service providers, including law enforcement, fire departments, and emergency medical services. While mitigation is not needed for Alternative A, available mitigation for Alternative B will include construction traffic management for the passing track (SS-MM#1). Project features will control and manage temporary impacts on emergency access and response time from construction vehicle operation including a CTP, established construction truck routes, a restriction on construction hours, the use of remote

parking areas for workers, and the designation of off-street parking for construction-related vehicles (TR-IAMF#1, TR-IAMF#2, TR-IAMF#5, TR-IAMF#6).

Permanent changes in emergency access would result from permanent roadway closures, relocations, and modifications due to the realignment of the Tunnel Avenue overpass and the relocation of the Brisbane Fire Station. The Relocated Brisbane Fire Station (Alternative A) would be approximately 800 feet to the south of the existing fire station with two driveways connecting to Bayshore Boulevard, which would provide access to Bayshore Boulevard that is equivalent to the existing level of access. The Relocated Brisbane Fire Station (Alternative B) would be approximately 150 feet to the south of the existing fire station with a driveway for the relocated fire station connecting to Bayshore Boulevard via the existing station's secondary driveway and non-exclusive access to the new Tunnel Avenue/Bayshore Boulevard interchange.

Fire trucks from the Relocated Brisbane Fire Station (Alternative B) would experience additional delays. Available mitigation will include building a new mid-block signalized intersection (i.e., signal only for the fire station driveway) and related median modifications for access at the relocated fire station driveway on Bayshore Boulevard between the intersections at Valley Drive and Old County Road (SS-MM#2).

Operations of the project would not result in permanent impacts on emergency response time and emergency response access with respect to interference with emergency response from train accidents and increased activity at stations and facilities, and continuous permanent interference with emergency response. The Authority will develop a risk-based SSMP and SSP, fire and life safety programs, and SEPP that would reduce the incidence and potential consequences of incidents to which local emergency responders could be required to respond. Coordination with Caltrain and local emergency response providers (as appropriate) would minimize potential impacts on emergency access by providing coordinated access to access-controlled areas and emergency operating procedures in the event of an emergency or evacuation.

Added traffic due to operations at the 4th and King Street, Millbrae, and San Jose Diridon Stations, as well as increased gate-down events at the at-grade crossings from added HSR trains, would result in increased delays at adjacent intersections, although EVP would reduce the effect of such delays where it is in place in San Jose. These activities would cause permanent delays in emergency vehicle response times. Available mitigation will include installing emergency vehicle priority treatments (SS-MM#3, SS-MM#4) and traffic delay/congestion mitigation measures (TR-MM#1a.2,TR-MM#1a.3, TR-MM#1a.5, TR-MM#1h, and TR MM#1i).

Community Safety and Security

Construction and operations of either project alternative would not result in temporary or permanent impacts on community safety and security. Construction of the project would not increase the exposure of passengers, employees, or the public to increased safety or security risks from criminal activity at construction sites; construction site hazards; or temporary or permanent traffic hazards. The SSMP will minimize the risk of criminal activity on construction sites, which will include security lighting, fencing, and monitoring measures to provide security to construction sites and protect the security of construction workers and equipment. Through compliance with legal requirements and effective safety plans, project features will minimize temporary exposure of workers and the public to construction site hazards. Temporary construction impacts on the safety of motor vehicle drivers, pedestrians, and bicyclists exposed to temporary or permanent traffic hazards of the project would be minimized through effective coordination with local jurisdictions, emergency vehicle access procedures and a traffic control plan, staggered road closures, vehicle and bicycle traffic and pedestrian safety project features.

Construction of either project alternative would not permanently interfere with airport safety and would not increase exposure to risk from high-risk facilities. Construction of some of the radio towers for the project would exceed FAR Part 77 imaginary surfaces and therefore would require FAA notification. The Authority expects the aeronautical studies that FAA would conduct under the FAR Part 77 notification process would not identify any safety hazards that would result in FAA recommending the relocation of a proposed communications tower location. The Authority

expects that in some cases the FAA may recommend some form of mitigation (e.g., attaching specific types of lighting or other visual markings to the communications tower poles), which could be implemented without affecting the location or function of the communications tower. Locations of communications towers would therefore not result in safety hazards to airport operations within the RSA.

Through effective coordination, planning, and control and prevention measures, project features (a fugitive dust control plan and an SSMP) will minimize the exposure risk of the public or construction workers to Valley fever. Project features (i.e., a PHA and the SSMP) will minimize the potential for high-risk facilities, including oil and natural gas pipelines and bulk fuel storage facilities, to be affected by construction of the project.

Operations of both project alternatives would not result in continuous permanent impacts related to operational safety impacts, exposure to wildfire hazards, exposure to high-risk facilities and tall structures, criminal and terrorist activity, or safety hazards to schools. Through effective planning and design of the project, impacts on safety from collisions and derailments that could expose passengers, employees, and the public to risks of accidents would be minimized.

Project features, such as a PHA and the SSMP, minimize the potential for high-risk facilities, including oil and natural gas pipelines, bulk fuel storage facilities, and tall structures (including bridges), to affect operations of either project alternative. Criminal or terrorist acts that could increase exposure to safety risks would be minimized through deterrence and detection systems and TVAs, and design standards and guidelines to allow emergency response access and evacuation in the event of a criminal or terrorist act. Project operations that could be subject to a derailment leading to safety hazards for schools would be effectively minimized through safety elements as part of the design. These elements would include a PTC system, inspection and maintenance programs, and intrusion detection systems for dedicated HSR facilities to minimize the risk of accidents.

Wildfire Hazards

Construction of the project would not increase the exposure of people or structures to a significant wildfire risk. The risk of wildfire hazard would be minimal because the project alternatives would not be built in any fire hazard severity zone within state responsibility areas, any very high fire hazard severity zone within local responsibility areas, or any wildland-urban interface fire area. Additionally, construction would comply with all required and recommended fire safety measures as per Cal. Public Res. Code Title 14 and Title 19 and alignments would be built in accordance with all requirements established by local jurisdictions and all other applicable fire code regulations. The risks of fires during project operations would be minimized with the low use of flammable materials, and risks from wildfires that could result in safety hazards would be effectively minimized through fire and life safety programs during design, construction, and operations of the project.

3.11.9 CEQA Significance Conclusions

As described in Section 3.1.5.4, the impacts of project actions under CEQA are evaluated against thresholds to determine whether a project action would result in no impact, a less-than-significant impact, or a significant impact. Table 3.11-16 identifies the CEQA significance conclusions for each impact discussed in Section 3.11.6. The table is followed by a summary of the significant impacts, mitigation measures, and factors supporting the significance conclusions after mitigation.

Alternatives A and B would have similar significant impacts across resource areas with the exception of differences in impacts on emergency response times related to building the passing track and LMF. The significant impacts under CEQA are summarized as follows.

Table 3.11-16 CEQA Significance Conclusions and Mitigation Measures for Safety and Security

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
Emergency Services and Response			
Impact S&S#1: Temporary Impacts on Emergency Access and Response Times from Temporary Road Closures, Relocations, and Modifications	Less than significant for Alternative A: Temporary road closures would be limited and would not result in inadequate emergency access. Significant for Alternative B: Construction of the project would result in delays in emergency vehicle access and response time through temporary road closures, relocations, modifications, and reconstructions, thereby resulting in an increase in emergency response time.	SS-MM#1: Construction Traffic Management for Passing Track Section (Alternative B)	Significant and unavoidable for Alternative B (for jurisdictions as noted): San Mateo, Belmont, San Carlos, and Redwood City: Passing track construction and associated modification of 9 underpasses
Impact S&S#2: Temporary Impacts on Emergency Access and Response Times from Construction Vehicles	Less than significant for Alternatives A and B: Project construction would not result in inadequate emergency vehicle access and response, because it would effectively control and manage construction vehicle traffic.	No mitigation measures are required.	N/A
Impact S&S#3: Permanent Impacts on Emergency Access and Response Times Caused by Construction	Less than significant for Alternative A: The relocation of the Brisbane Fire Station and connection to Bayshore Boulevard by two driveways would provide full access to Bayshore Boulevard that is equivalent to the existing level of access provided. Significant for Alternative B: Construction of the project would cause delays in response times for the Relocated Brisbane Fire Station (Alternative B) because of changes in fire station access associated with the Tunnel Avenue overpass relocation and realignment.	SS-MM#2: Modify Driveway Access Control for Relocated Brisbane Fire Station (Alternative B)	Less than Significant

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
Impact S&S#4: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities	Less than significant for Alternatives A and B: Project features effectively minimize the incidence and potential consequences of incidents to which local emergency responders could be required to respond.	No mitigation measures are required.	N/A
Impact S&S#5: Continuous Permanent Direct Impacts on Emergency Access and Response Time Related to the HSR System	Less than significant for Alternatives A and B: Project features minimize permanent interference with emergency response access and evacuations in the event of an emergency during operations.	No mitigation measures are required.	N/A
Impact S&S#6: Continuous Permanent Impacts on Emergency Access and Response Times due to Station Traffic and Increased Gate-Down Time	Significant for Alternatives A and B: Operations of the project would cause delays in response times greater than 30 seconds for fire stations and emergency vehicles due to added traffic at the 4th and King Street Station, the Millbrae Station, and the San Jose Diridon Station, and at the at-grade crossings because of increases in gate-down time from added HSR trains in Burlingame, Redwood City, Menlo Park, Palo Alto, and Mountain View for Alternatives A and B.	SS-MM#3: Install Emergency Vehicle Priority Treatments near HSR Stations SS-MM#4: Install Emergency Vehicle Priority Treatments Related to Increased Gate-Down Time Impacts In addition, if cities choose not to implement fire station improvements included in SS-MM#4 the following traffic delay mitigation measures will be required: TR MM#1a.2, TR MM#1a.3, TR MM#1a.5, TR MM#1h, and TR-MM#1i	Significant and unavoidable for Alternatives A and B (for jurisdictions as follows): Burlingame (fire station/first responder access impacts): Area east of rail corridor bounded by Oak Grove to Howard Lane crossings if City of Burlingame chooses not to construct and operate emergency vehicle priority treatments. Redwood City (fire station/first responder impact): Area west of rail corridor from Whipple Avenue crossing to Broadway if Redwood City chooses not to build and operate emergency vehicle priority treatments. Menlo Park (fire station/first responder impact): Area east of Ravenswood Avenue if City of Menlo Park chooses not to build and operate emergency vehicle priority treatments. Menlo Park/Palo Alto (fire station/first responder impact): Area west of El Camino Real just north of Sand Hill Road, on the border of Menlo Park and Palo Alto, if the City of Menlo Park and City of Palo Alto choose not to build and operate emergency vehicle priority treatments.

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
			Mountain View (fire station/first responder impact): Area west of rail corridor adjacent to Rengstorff Avenue if City of Mountain View chooses not to build and operate emergency vehicle priority treatments. Less than significant with mitigation measures at other locations.
Community Safety and Security			
Impact S&S#7: Temporary Exposure to Criminal Activity at Construction Sites	Less than significant for Alternatives A and B: Project features provide areas and methods to secure equipment and materials after hours and the use of security personnel and security lighting and monitoring.	No mitigation measures are required.	N/A
Impact S&S#8: Temporary Exposure to Construction Site Hazards	Less than significant for Alternatives A and B: Project features include safety plans and compliance with regulations and standards, which minimize impacts from construction site hazards and accident risks that could compromise the safety of workers, visitors, or the public.	No mitigation measures are required.	N/A
Impact S&S#9: Temporary Exposure to Construction-Related Traffic Hazards	Less than significant for Alternatives A and B: Project features such as the construction safety transportation management plan minimize temporary construction impacts on the safety of motor vehicle drivers, pedestrians, and bicyclists.	No mitigation measures are required.	N/A
Impact S&S#10: Permanent Exposure to Traffic Hazards	Less than significant for Alternatives A and B: The project's permanent roadway closures and relocations would not result in a change to vehicle circulation that would increase the public's exposure to traffic hazards. The project includes roadway safety improvements that will reduce traffic hazards by minimizing the potential for conflicts between trains and motor vehicles, pedestrians, and bicycles, resulting in a beneficial effect on community safety.	No mitigation measures are required.	N/A

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
Impact S&S#11: Permanent Interference with Airport Safety	Less than significant for Alternatives A and B: Structures including radio towers would exceed FAR Part 77 height limits and therefore would require FAA notification. The Authority expects the aeronautical studies that FAA would conduct under the FAR Part 77 notification process would not identify safety hazards that would result in FAA recommending the relocation of a proposed communications tower. The Authority expects that in some cases FAA may recommend some form of mitigation (e.g., attaching specific types of lighting or other visual markings to the communications tower poles), which could be implemented without affecting the location or the function of the communications tower. The Authority would work with the FAA to implement FAA-proposed (if any) mitigation measures for FAR Part 77 notification structures.	No mitigation measures are required.	N/A
Impact S&S#12: Temporary Exposure to Valley Fever	Less than significant for Alternatives A and B: Project features, such as effective fugitive dust control measures and an SSMP, minimize the risk of exposure to Valley fever.	No mitigation measures are required.	N/A
Impact S&S#13: Temporary Exposure to High-Risk Facilities and High-Risk Utilities	Less than significant for Alternatives A and B: An SSMP minimizes the potential for impacts of high-risk facilities and utilities on community safety during construction.	No mitigation measures are required.	N/A
Impact S&S#14: Permanent Exposure to Rail-Related Hazards	Less than significant for Alternatives A and B: Project features, including protective barrier structures, derailment containment, and hazard and threat vulnerability analyses, minimize risks of collisions and derailments.	No mitigation measures are required.	N/A

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
Impact S&S#15: Continuous Permanent Exposure to High-Risk Facilities and Fall Hazards	Less than significant for Alternatives A and B: Project features, including removal, relocation, or protection in place of high-risk facilities, development of facility-specific measures, and operational safety features, including PTC, minimize the potential for high-risk facilities and tall structures to affect operations.	No mitigation measures are required.	N/A
Impact S&S#16: Continuous Permanent Exposure to Criminal and Terrorist Activity	Less than significant for Alternatives A and B: Project features minimize safety risks through planning, coordination, and design features to minimize the risk of criminal or terrorist acts and provide safe access for emergency response and evacuation.	No mitigation measures are required.	N/A
Impact S&S#17: Continuous Permanent Safety Hazards to Schools	Less than significant for Alternatives A and B: A PTC system and inspection and maintenance programs would minimize the risk of accidents, and derailment containments would keep the train within the right-of-way and railcars upright in the event of a derailment.	No mitigation measures are required.	N/A
Impact S&S#18: Temporary Exposure to Wildfire Hazards	Less than significant for Alternatives A and B: The project alternatives do not cross existing designated wildfire hazard severity zones and project construction will comply with all required and recommended fire safety measures as per Cal. Public Res. Code Title 14 and Title 19, and alignments would be built in accordance with all requirements established by local jurisdictions and all other applicable fire code regulations.	No mitigation measures are required.	N/A

Impacts	Impact Description and CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
Impact S&S#19: Permanent Exposure to Wildfire Hazards	Less than significant for Alternatives A and B: The project alternatives do not cross existing designated wildfire hazard severity zones and the Authority will coordinate and plan for rapid emergency response during accidents to reduce the potential for uncontrolled wildfires.	No mitigation measures are required.	N/A

CEQA = California Environmental Quality Act
FAA = Federal Aviation Administration
FAR = Federal Aviation Regulation
HSR = high-speed rail
PTC = positive train control
SSMP = safety and security management plan

Impact S&S#1: Temporary Impacts on Emergency Access and Response Times from Temporary Road Closures, Relocations, and Modifications

There would be a significant impact under CEQA for Alternative B (both viaduct options) because temporary road closures, relocations, and modifications associated with construction would result in delays in emergency vehicle access and increases in response times. Alternative B would have temporary construction impacts associated with the passing track, which would require modifications to nine roadway undercrossings. Other potential temporary impacts for the alternatives include delays from lane and road closures that may be required to build four-quadrant gates at the at-grade crossings and road improvements on the west side of the Millbrae Station. SS-MM#1 will minimize temporary impacts on emergency vehicles during passing track construction but will not avoid impacts entirely. The impact would be significant and unavoidable under CEQA for Alternative B.

Impact S&S#3: Permanent Impacts on Emergency Access and Response Times Caused by Construction

Permanent interference with emergency response times under Alternative B would be a significant impact under CEQA because construction of the West Brisbane LMF would require relocation of the Tunnel Avenue overpass, which in turn would require relocation of the Brisbane Fire Station and a change in its driveway access location. The permanent relocation of the Tunnel Avenue overpass, the resulting station relocation, and modification of the driveway would remove the Brisbane Fire Station's exclusive access to the signalized Bayshore Boulevard/Valley Drive intersection, such that additional delay for exiting fire trucks could occur, resulting in inadequate emergency access under Alternative B. The Authority will construct a new mid-block signalized intersection (i.e., signal only for the fire station driveway) and related median modifications at the new driveway for the Brisbane Fire Station on Bayshore Boulevard between intersections at Valley Drive and Old County Road (SS-MM#2) in order to maintain existing emergency vehicle response times. The proposed mitigation measure will avoid the impacts on emergency response by providing a new traffic signal to maintain emergency vehicle access through project construction and operations. With implementation of this measure, the fire station impact would be reduced to a less-than-significant level under Alternative B.

Impact S&S#6: Continuous Permanent Impacts on Emergency Access and Response Time Due to Station Traffic and Increased Gate-Down Time

The impact on emergency vehicle response times would be significant under CEQA for the project alternatives because the added traffic at the three HSR stations and the delays associated with gate-down time from added HSR trains would increase emergency response time by over

30 seconds for fire stations in San Francisco, Millbrae, Burlingame, Redwood City, Menlo Park, Palo Alto, Mountain View, and San Jose under the project alternatives.

Both project alternatives would result in increased traffic at the 4th and King Street Station and the San Jose Diridon Station, which would affect fire station emergency response times, and increased traffic at the Millbrae Station, which would affect fire station/first responder emergency response times although EVP would reduce the effect of such delays where it is in place in San Jose. SS-MM#3 will develop an emergency vehicle priority plan and install emergency vehicle priority treatments and new traffic control devices as needed for San Francisco Fire Station 8, Millbrae Fire Station 37, and San Jose Fire Station 30. With this mitigation, the impact on fire station emergency response times relative to the 4th and King Street Station and San Jose Diridon Station and on fire station/first responder emergency response times relative to the Millbrae Station would be less than significant.

The project alternatives would also result in increased delays at the at-grade crossings because of increased gate-down time due to added HSR trains. These activities would result in ongoing operations impacts on emergency vehicle access and response times. The increase in gate-down time from added HSR trains would result in a significant impact on fire station/first responder emergency vehicle access and response times in Burlingame, Redwood City, Menlo Park, Palo Alto, and Mountain View for the project alternatives. SS-MM#4 will provide funding for monitoring of at-grade crossing conditions and construction of emergency vehicle priority treatments as needed. Fire station emergency vehicle response time impacts at Burlingame, Redwood City, Menlo Park, Palo Alto, and Mountain View will be reduced to a less-than-significant level if the cities choose to build and operate new emergency vehicle priority treatment improvements funded by HSR; if they do not, then impacts would remain significant and unavoidable.

If local jurisdictions do not implement emergency vehicle response improvements with the Authority funding for construction, proposed site-specific traffic mitigation measures from Section 3.2.7 that address peak-hour delays at intersections adjacent or nearby to locations with significant emergency vehicle response time effects due to gate-down time (TR-MM#1a.2,TR-MM#1a.3, TR-MM#1a.5, TR-MM#1h, and TR-MM#1i) will help to reduce congestion near at-grade crossings but will not eliminate delays at the at-grade crossings themselves.

Grade separations could avoid the remaining significant emergency vehicle access and response time impacts related to increased gate-down time at the at-grade crossings in Menlo Park (Ravenswood Avenue) and Mountain View (Rengstorff Avenue). Mitigation measures described above for Menlo Park would not be required if the planned Ravenswood Avenue rail grade-separation project is built prior to implementation of full HSR service. Similarly, a new fire station would not be required in Mountain View if the planned Rengstorff Avenue rail grade-separation project is built prior to implementation of full HSR service. The Authority supports a regional effort to identify funding and implement crossing improvements. This impact would remain significant and unavoidable under CEQA for the project alternatives.