3.11 Safety and Security

3.11.1 Introduction

As described in the Program EIR/EIS documents, safe operation of the HST is of highest priority. To achieve this, the HST system would be fully grade-separated and fully access-controlled with intrusion monitoring systems. This means that the HST infrastructure (mainline tracks and maintenance and storage facilities) would be designed to prevent access by unauthorized vehicles, people, animals, and objects and to prevent any interface with other modes of transportation. The system would also include appropriate barriers (fences and walls) and state-of-the-art communication, access-control, and monitoring and detection systems. In addition, all aspects of the HST system would conform to the latest federal requirements regarding transportation security.

The California HST System would achieve overall safety and reliability through the application of proven technical standards commensurate with the desired level of performance. Based on the long-term operating success of European and Asian systems, and because the United States has no specific or current guidelines for the development of a high-speed rail system capable of 220-mph travel, the HST System design considers and adapts the existing European and Asian processes and standards.

Given its complex and high-speed operating environment, high-speed railways must be developed from the beginning as a system, integrating all elements to work together in an efficient, safe, and reliable manner. An HST system design approach considers the physical and operational relationships among the various subsystems (infrastructure, rolling stock, train controls, electrification, and operations and maintenance) and optimizes the physical design requirements with operational and maintenance activities to deliver a high level of safety and reliability. As a result, the Authority’s technical standards address and integrate an overall set of guiding principles or system requirements consistent with European and Asian high-speed rail systems to ensure the safety and reliability of the California HST System.

This section of the Merced to Fresno HST Project EIR/EIS provides details on safety issues related to construction and operation of the HST alternatives, including the measures and regulations currently in place, or that would be implemented to keep employees, passengers, pedestrians, bicyclists, and motorists safe from HST-related activities. This section also considers security issues that could result from criminal acts that could affect HST operation and the ability for emergency responders to respond to incidents.

Safety concerns associated with other hazardous conditions are described and evaluated elsewhere in this EIR/EIS, as follows:

- Section 3.3, Air Quality and Global Climate Change, covers safety hazards from air emissions such as air toxics.
- Section 3.9, Geology, Soils, and Seismicity, addresses seismic and geotechnical hazards.
- Section 3.10, Hazardous Materials and Wastes, addresses safety issues related to hazardous materials and wastes from use or exposure to soil and groundwater contamination fire.

Highway travel is by far the most-used and dangerous transportation mode when compared to air and rail modes of transportation. In 2008 alone, there were over 3,400 fatalities and approximately 242,000 nonfatal injuries on California highways (California Highway Patrol 2008). The National Highway Traffic Safety Administration (NHTSA) estimates that deaths and injuries resulting from motor vehicle crashes are the leading cause of death for persons between the ages of 3 and 34 in the United States (NHTSA 2008). The potential for highway accidents increases with the appearance of more and more vehicles on state highways.

By contrast, conventional passenger rail service is extremely safe when compared with other modes of transportation. Sophisticated train control, communications and signaling systems, and protected grade crossings, for example, have made conventional passenger rail service in the United States a safe way to travel. Figures 3.11-1 and 3.11-2 present a fatality comparison among modes.

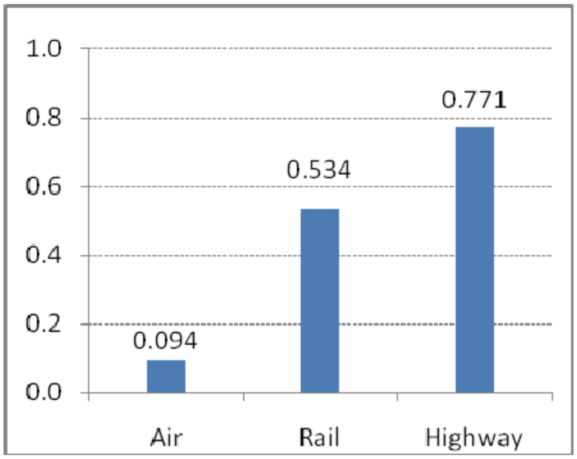


Figure 3.11-1
Fatalities per 100 Million Passenger Miles in 2008

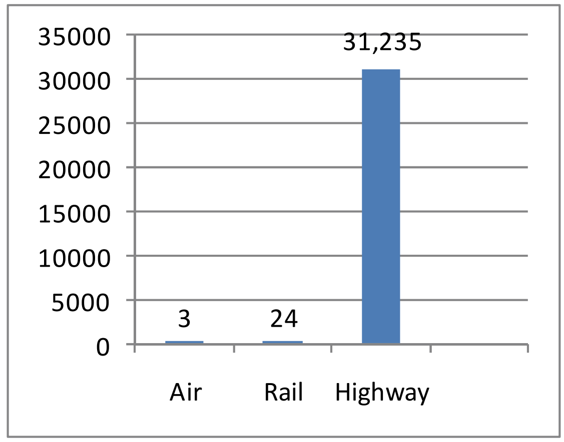


Figure 3.11-2
Total Passenger Fatalities in 2008

Note: The U.S. Department of Transportation's Federal Motor Carrier Safety Administration monitors heavy truck safety in terms of fatalities per 100 million miles traveled. In 2008, the heavy truck fatality rate was 0.143 fatality per 100 million miles traveled. Source: FRA (2010).

International experience operating HST systems has surpassed the passenger rail safety record achieved in the United States. Since 1964 and the inauguration of the first HST service in Japan, Japanese HSTs (the Shinkansen) have maintained a record of no passenger fatalities or injuries due to train accidents, including derailments or collisions (Central Japan Railway Company 2011). In France, HSTs (the TGV) have been operating for 27 years and currently carry more than 100 million passengers a year. Like Japan, the French HST system has not had a single HST-related passenger fatality on its dedicated HST trackway, which is similar to the dedicated trackway proposed for the California HST System (TGVweb no date). Unlike France and Japan, Germany's HST, the InterCity Express (ICE), does not use an entirely dedicated track system, but shares track with freight and conventional passenger rail. An HST accident in the late 1990s prompted design changes to the wheels of German ICE trains to remedy a design flaw (North East Wales Institute of Higher Education [NEWI] 2004; NASA 2007). German ICE trains carry more than 66 million passengers a year.

HST service was introduced in China in 2007 and that country now has 6,012 miles of high-speed rail lines, the most of any country in the world (Railway-Technology.com). On July 23, 2011, a HST rear-ended another HST on a viaduct in Wenzhou, killing 40 people and injuring 72. The crash was caused by the failure of signaling equipment. This equipment was determined to have a flawed design that was not properly identified during its development. The official investigation found that the accident was symptomatic of a lack of emphasis on safety by the management of China's rapidly growing HST industry (Areddy 2011).

In addition to the safe operation of most HST systems around the world, international rail operators also have given high priority to security issues, including the protection of people from intentional acts that could injure or harm them and the protection of property from deliberate acts. Each of the 12 HST systems now in operation around the world has implemented measures to reduce or minimize criminal and terrorist activities (Taylor et al. 2005). Maintaining a safe and secure traveling environment is important to passenger confidence in using these rail systems.

3.11.2 Laws, Regulations, and Orders

The following federal, state, and local laws, regulations, and agency jurisdiction and management guidance pertain to safety and security.

3.11.2.1 Federal

FRA is the federal agency responsible for development and enforcement of safety rules for railroads and railroad employees.

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

The Rail Safety Improvement Act reauthorized funding to enable FRA to oversee the nation's rail safety program between 2009 and 2013. One aim of the statute is to improve conditions of rail bridges and tunnels. The Rail Safety Improvement Act also requires that railroads implement positive train control (PTC) systems to prevent train-to-train collisions on certain rail lines by the end of 2015. PTC infrastructure consists of integrated command, control, 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. Presently, the emphasis of the FRA regulations is on the crashworthiness side of passenger vehicles, whereas PTC shifts the safety emphasis to crash-avoidance.

Federal Railroad Administration (49 CFR Volume 4, Chapter II, Parts 200 to 299)

FRA regulations for railroad transportation safety, including standards, rules, and practices, are listed in 49 CFR Parts 200 to 299.

U.S. Code on Railroad Safety (49 U.S.C. §§ 20101 et seq.)

Part A of Subtitle V of Title 49 of the United States Code (49 U.S.C. §§ 20101 et seq.) contains a series of statutory provisions affecting the safety of railroad operations. In particular, Section 20109 protects the reporting of safety concerns and injuries and prohibits railroads from disciplining, discharging, or retaliating in any form against employees who engage in protected activities. This section also prohibits the delay or interference of an injured employee's treatment.

Department of Homeland Security/Transportation Security Administration (49 CFR 1580)

Part 1580, Rail Transportation Security, codifies the Transportation Security Administration inspection program. It also includes security requirements for freight railroad carriers; 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 require rail transportation operators to implement 15 protective security measures, which include reporting potential threats and security concerns to the Transportation Security Administration, and designate a primary and alternate security coordinator.

Emergency Planning and Community Right-to-Know Act (42 CFR 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.

3.11.2.2 State

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

The California Public Utilities Code Sections 7710 to 7727 cover railroad safety and emergency planning and response. Under this code, the Public Utilities Commission is required to adopt safety regulations and to report sites on railroad lines that are deemed hazardous within California. 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 onsite response in the event of a large-scale unauthorized release of hazardous materials. Modifications of existing highway-rail crossings require Commission authorization, and temporary impaired clearance during construction requires application to the Commission and notice to railroads.

California Emergency Services Act (Sections 8550 to 8692)

The Emergency Services Act supports the State's responsibility to mitigate adverse effects of natural, manmade, 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 Office of Emergency Services 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 the provisions through necessary and proper actions.

California Public Resources Code Section 21096

The California Public Resources Code requires that the California Department of Transportation, Division of Aeronautics *California Airport Land Use Planning Handbook* (Caltrans Division of Aeronautics 2002) be used as a technical resource to assist in the preparation of an EIR for any projects situated with the boundaries established by an airport land use compatibility plan. The *Airport Land Use Planning Handbook* supports the State Aeronautics Act (Caltrans Division of Aeronautics 2002) providing 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.

3.11.2.3 Regional and Local

Section 65302(g) of the California Government Code requires all general plans to include a safety element 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 because those items relate to identified fire and geologic hazards. The general plans for Merced, Madera, and Fresno counties and the incorporated communities of those counties contain safety elements addressing these issues.

In addition to the safety elements in the general plans, the counties and cities have adopted emergency plans that provide operating procedures for safety and security. Other local policies and ordinances related to safety and security include the safety provisions in county codes, city municipal codes, city and county hazardous waste management plans, and fire department master plans. Table 3.11-1 lists safety and security plans by jurisdiction that were identified and considered as part of this analysis. Section 3.10, Hazardous Materials and Wastes, outlines hazardous waste response plans.

Table 3.11-1
General Plans and Other Plans Considered

Jurisdiction	General Plan and Other Plans
Merced County	▪ Merced County Year 2000 General Plan (1990) ▪ Merced County Emergency Operations Plan (2007) ▪ Merced County Municipal Code, Chapter 2.72: Office of Emergency Services and Operational Area Council ▪ Merced Regional Airport Emergency Plan (2008; revised 2011)
City of Atwater	▪ City of Atwater General Plan (2000) ▪ Atwater Municipal Code, Chapter 2.44: Emergency Organization
City of Merced	▪ City of Merced Vision 2030 General Plan (2012) ▪ City of Merced Emergency Operations Plan (2003) ▪ Merced Municipal Code, Title 8.20: Disaster Control
Madera County	▪ Madera County General Plan (1995) ▪ Madera County Municipal Code, Title 2.78: Emergency Services and Disaster
City of Chowchilla	▪ City of Chowchilla Draft 2040 General Plan Update (2011) ▪ Chowchilla Municipal Code, Chapter 2.28: Emergency Services Act
City of Madera	▪ City of Madera Comprehensive General Plan & Environmental Impact Report (2009) ▪ Madera Municipal Code, Title III: Public Safety
Fresno County	▪ Fresno County General Plan (2000) ▪ Fresno County Municipal Code, Chapter 2.44: Emergency Organization
City of Fresno	▪ 2025 Fresno General Plan and Related Environmental Impact Report No. 10130 (2002) ▪ City of Fresno Emergency Operations Plan (2008) ▪ Fresno Municipal Code, Chapter 2, Article 5: Emergency Services Ordinance

Emergency services in the San Joaquin Valley are provided by fire and police departments that coordinate as necessary through California's Standardized Emergency Management System (SEMS). This system is explained further in Section 3.11.4, which also contains information on emergency medical services.

Airport Plans

Airport master plans and compatibility plans provide guidance for land use and facilities planning that minimize safety risks on the ground in airport influence zones. Table 3.11-2 provides a list of airport master plans and airport land use compatibility plans.

Table 3.11-2
Airport Plans Considered

Location of Airport	Airport Plan
Merced County	▪ Merced County Airport Land Use Commission – Land Use Compatibility Plan (1999) ▪ Merced Municipal Airport Master Plan (2007) ▪ Merced Regional Airport Emergency Plan (2008; revised 2011)
Madera County	▪ Madera County Airport Land Use Commission – Airport Land Use Compatibility Plan (1993)
Fresno County	▪ Fresno County Airport Land Use Commission – Land Use Compatibility Plan (2010) ▪ Fresno-Chandler Downtown Airport Master and Environs Specific Plan (1999)

3.11.2.4 Other Requirements

Many state and local safety requirements refer to National Fire Protection Association (NFPA) codes and standards. NFPA develops, publishes, and disseminates more than 300 codes and standards intended to minimize the possibility and effects of fire and other risks.

3.11.3 Methods for Evaluating Impacts

This section considers the exposure of HST system passengers and employees or structures to significant risk of loss, injury, or death during construction and operation of the project. Because no HST system currently operates in the United States, the evaluation of safety and security impacts is based on (1) international rail operating experience and (2) existing conditions compared with the design and operational features of the HST alternatives. For safety, issues addressed include future rail system operations, such as train travel; vehicle, bicycle, and pedestrian access at stations; and emergency response by fire, law enforcement, and emergency services to fire, seismic events, or other emergency situations. For security, the analysis evaluates impacts associated with the incidence of crime against people and property, including acts of terrorism.

3.11.3.1 Methods for Evaluating Effects under NEPA

Pursuant to NEPA regulations (40 CFR 1500-1508), project effects are evaluated based on the criteria of context and intensity. Context means the affected environment in which a proposed project occurs. Intensity refers to the severity of the effect, which is examined in terms of the type, quality, and sensitivity of the resource involved, location and extent of the effect, duration of the effect (short- or long-term), and other considerations. Beneficial effects are identified and described. When there is no measurable effect, impact is found not to occur. The intensity of adverse effects is the degree or magnitude of a potential adverse effect, described as negligible, moderate, or substantial. Context and intensity are considered together when determining whether an impact is significant under NEPA. Thus, it is possible that a significant adverse effect may still exist when on balance the impact has negligible intensity or even if the impact is beneficial. For safety and security, the terms are respectively defined as follows.

- Effects with *negligible* intensity on public safety are defined as impacts that would not increase emergency response times or risk of accidents beyond existing conditions. Effects with *moderate* intensity on public safety are defined as impacts that would increase emergency response times or risk of accidents at specific sites or localized areas but that would not have wide-ranging effects. Effects with *substantial* intensity on public safety are defined as impacts that would increase emergency response times or risk of accidents on a regional scale.

- Effects with *negligible* intensity on security are defined as impacts that would not increase the risk of criminal or terrorist acts beyond existing conditions. Effects with *moderate* intensity on security are defined as impacts that would increase the risk of criminal or terrorist acts in localized areas but that would not have wide-ranging effects. Effects with *moderate* intensity on security are defined as impacts that would increase the risk of criminal or terrorist acts on a regional scale or affect prison security.

3.11.3.2 CEQA Significance Criteria

The California Environmental Quality Act (CEQA) requires the analysis of impacts to determine whether significant impacts would occur as a result of the proposed alternatives and the identification of specific mitigation for significant impacts. Under Appendix G of the CEQA Guidelines, a significant safety or security impact would occur if a project were to do one of more of the following:

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the safety of such facilities.
- Substantially increase hazards due to a design feature (for example, 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 located within 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 and/or within the vicinity of a private airstrip).
- 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.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

3.11.3.3 Study Area

For the evaluation of direct safety and security effects, the Merced to Fresno Section study area includes the HST right of way, areas adjacent to the construction footprint, and the area within a 0.5-mile radius of the proposed Downtown Merced and Downtown Fresno stations. The indirect effects study area is made up of the cities and counties between Fresno and Merced. Because certain service providers' service boundaries fall within the direct impacts study area, indirect effects from the proposed project could influence an area larger than the direct impacts study area.

The safety and security evaluation also includes certain services (fire departments, police departments, and hospitals) that are not located within the study area but have service boundaries in or would provide service within the study area, as well as airports and high-risk facilities within 2 miles of the construction footprint. Locations of emergency service responders, airports, and civic buildings are illustrated in Figures 3.11-3 through 3.11-6.

3.11.4 Affected Environment

This section discusses the affected environment related to safety and security in the study area.

3.11.4.1 Emergency Services

Fire

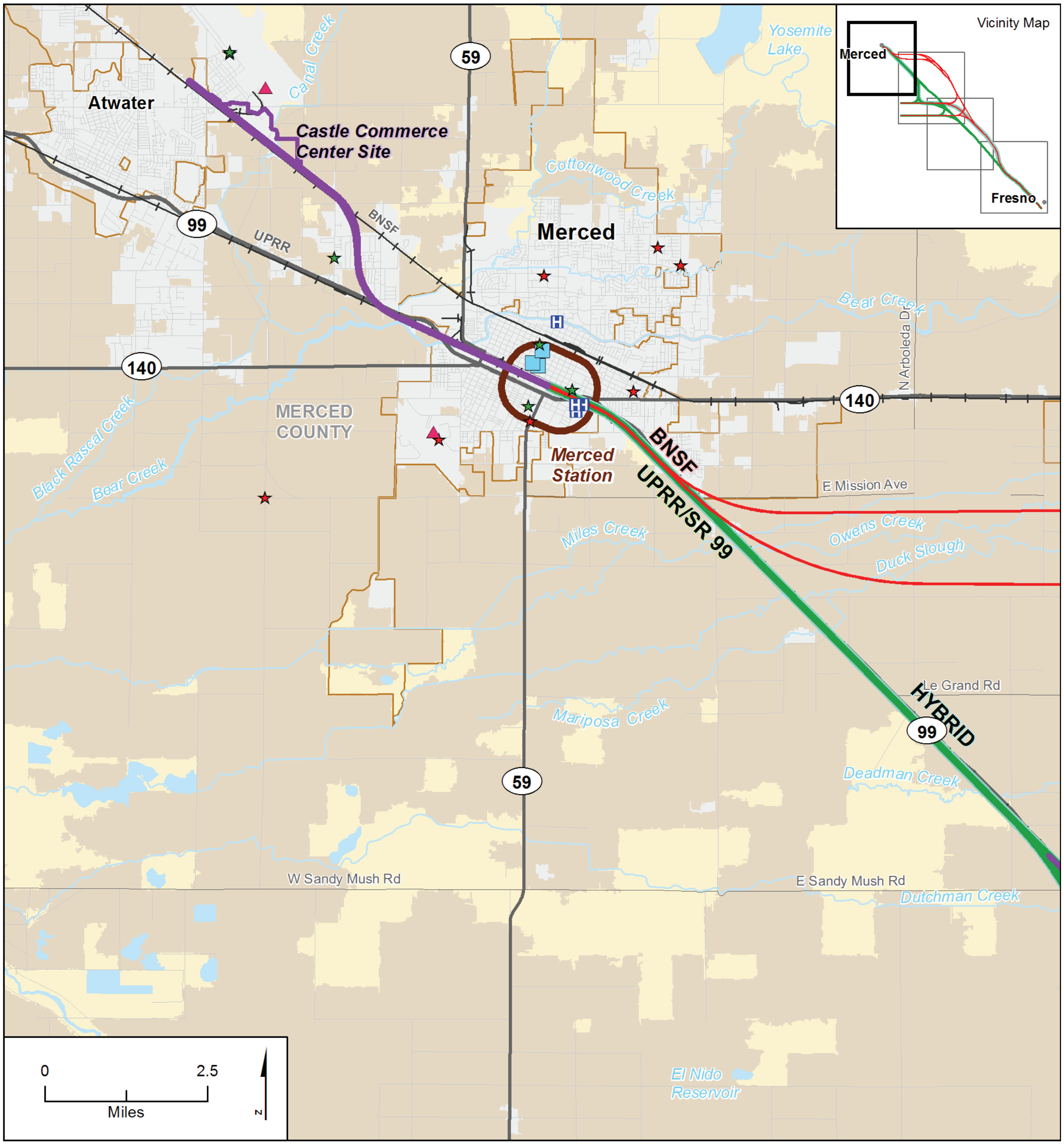
Table 3.11-3 summarizes the fire departments and the types of equipment operated within the Merced to Fresno Section. Fire stations in the vicinity of the HST alternatives are shown in Figures 3.11-3 through 3.11-6. All of the fire departments consist of paid employees, except for the City of Chowchilla, which operates an entirely volunteer fire department. The city fire departments have mutual aid agreements with county fire protection services (and in some cases with one another) to provide concurrent, cooperative response and assistance during emergencies.

Table 3.11-3
Fire Departments and Equipment

Fire Department	Service Area	Equipment
City of Atwater (contracted through Cal Fire)	City of Atwater/unincorporated area of Merced County	50-foot ladder truck (currently out of commission) Rescue trailer (currently out of commission)
Merced County (contracted through Cal Fire)	Unincorporated areas of Merced County	Hazmat rig
City of Merced	City of Merced	5 front-line engines 4 reserve engines 2 ladder trucks – 85 feet and 105 feet tall Hazmat decontamination trailer Rescue boat Rescue trailer Aircraft crash fire rescue engine
City of Chowchilla	City of Chowchilla and surrounding unincorporated area	No ladder trucks or hazmat trucks
Madera County (contracted through Cal Fire)	Unincorporated areas of Madera County	75-foot ladder truck at Station 8 – Indian Lakes, 15 miles from study area Hazmat rig
City of Madera (contracted through Cal Fire)	Portions of the City of Madera	50-foot ladder truck (about to go out of commission)
City of Fresno	City of Fresno and adjacent Fresno County areas under contract with the North Central Fire Protection District and Fig Garden Fire Protection District	19 engines 5 ladder trucks – at least 85 feet tall Urban search and rescue apparatus 2 water tenders 2 hazmat apparatus Hazmat decontamination trailer 2 brush rigs for vegetation fires Light and air unit

Cal Fire = California Department of Forestry and Fire Protection
Hazmat = hazardous materials

Sources: City of Atwater Fire Department (2009), City of Merced Fire Department (2009), City of Chowchilla Volunteer Fire Department (2009), City of Madera Fire Department (2009), City of Fresno Fire Department (2009), Scott (2011), Anderson (2010), Gardine (2010), McDonald (2010), Mitchum (2009), Moore (2009).



Source: Cal Fire (2007a,b,c) and City of Fresno Fire Department (2009).
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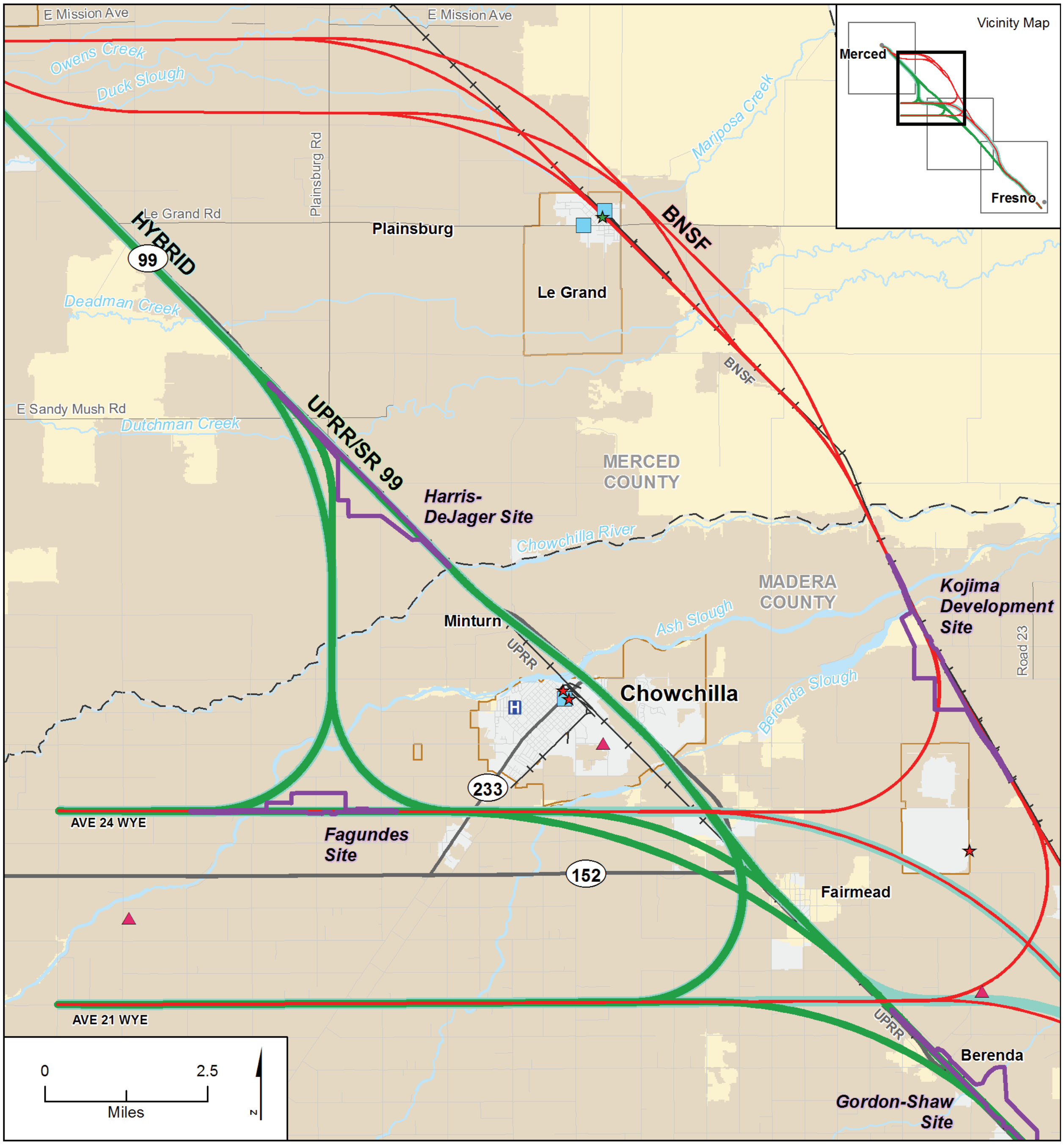
- UPRR/SR 99 Alternative
- BNSF Alternative
- Hybrid Alternative
- Potential Heavy Maintenance Facility
- Station Study Area
- City Limit
- County Boundary
- Railroad
- Government (City Hall, Courthouse, Jail, Post Office, Library)
- Hospital
- Fire Station
- Public Service (Police Station, Sheriff Department)
- Airport/Heliport

Fire Severity Zone
- Very High
- High
- Moderate
- Non-Wildland/Non-Urban
- Urban Unzoned

Figure 3.11-3
Safety and Security Existing Conditions
in the Merced Project Vicinity



Source: Cal Fire (2007a,b,c) and City of Fresno Fire Department (2009). MF_EIS_SS_01-04_b Jun 02, 2011

UPRR/SR 99 Alternative
BNSF Alternative
Hybrid Alternative
Potential Heavy Maintenance Facility
Station Study Area
City Limit
County Boundary
Railroad

Government (City Hall, Courthouse, Jail, Post Office, Library)
Hospital
Fire Station
Public Service (Police Station, Sheriff Department)
Airport/Heliport

Fire Severity Zone
Very High
High
Moderate
Non-Wildland/Non-Urban
Urban Unzoned

Figure 3.11-4
Safety and Security Existing Conditions in the Chowchilla Project Vicinity

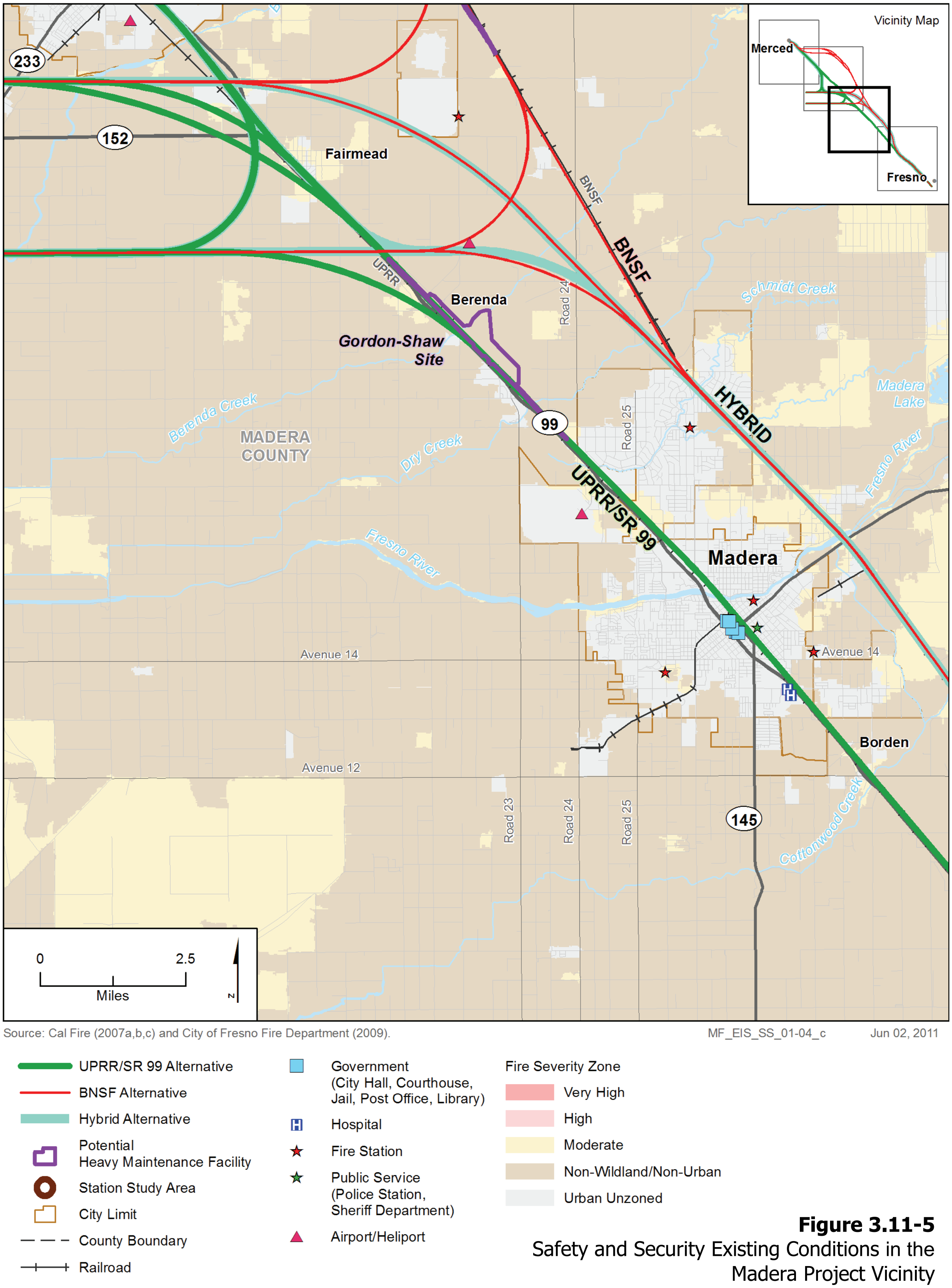
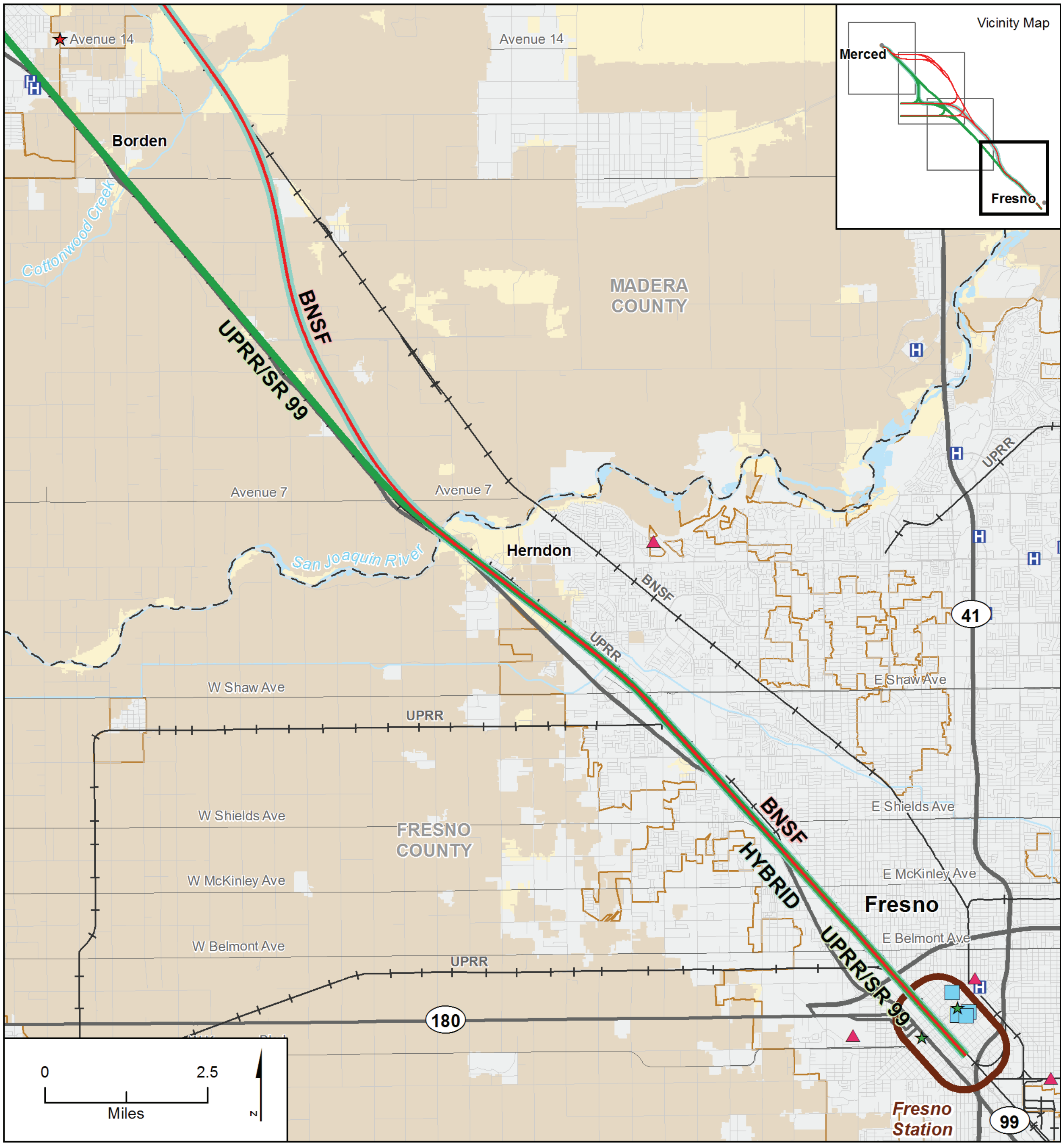


Figure 3.11-5
Safety and Security Existing Conditions in the Madera Project Vicinity



Source: Cal Fire (2007a,b,c) and City of Fresno Fire Department (2009). MF_EIS_SS_01-04_d Jun 02, 2011

UPRR/SR 99 Alternative
BNSF Alternative
Hybrid Alternative
Potential Heavy Maintenance Facility
Station Study Area
City Limit
County Boundary
Railroad

Government (City Hall, Courthouse, Jail, Post Office, Library)
Hospital
Fire Station
Public Service (Police Station, Sheriff Department)
Airport/Heliport

Fire Severity Zone
Very High
High
Moderate
Non-Wildland/Non-Urban
Urban Unzoned

Figure 3.11-6
Safety and Security Existing Conditions in the Fresno Project Vicinity

Response times for fire departments vary. The cities of Merced and Fresno respond to calls within 5 minutes of receiving an alert 90% or more of the time (City of Merced Fire Department 2009). The City of Madera responds to calls within 5 minutes approximately 75% of the time (Myers 2010). Response times in rural areas of Merced and Madera counties can exceed 20 minutes, depending on how close the nearest stations are and whether firefighters are responding to other emergencies. In both Merced County and Madera County, one paid firefighter staffs each rural station, and, depending on volunteer firefighter availability, up to four stations may need to respond to a single emergency to provide adequate staff for the response (Anderson 2010, Moore 2009).

At-grade railroad crossings hinder emergency response times when trains block the crossings. In such instances, emergency response teams must use routes that take them farther away from their destination (i.e., out-of-direction routes) in order to bypass the train and reach emergencies on the other side of the tracks. This is particularly problematic in rural areas where crossings are farther apart.

Cal Fire has prepared the Strategic Fire Plan for California, which is the State's road map for reducing the risk of wildfire (Cal Fire 2010). Part of this plan identifies and assesses community assets at risk of wildfire damage. Cal Fire has generated a list of California communities at risk for wildfire and created fire hazard severity zones (Cal Fire 2007a,b,c). Cal Fire classifications for areas of the HST corridor include the following:

- Most of the UPRR/SR 99 Alternative exists outside of the agency's fire hazard zones and is free of major wildland fire hazards. However, a few isolated locations are designated as moderate fire hazard severity zones; these are illustrated in Figures 3.11-3 through 3.11-6.
- Along the BNSF Alternative, several areas are designated as moderate fire hazard severity zones, including an area 4 miles north of the Merced-Madera county line; isolated areas north and east of the City of Madera; and isolated portions of the Ave 24 Wye. The remaining portions of the alignment are free from major wildland fire hazards.
- The Hybrid Alternative avoids moderate fire hazard severity zones north of the Merced-Madera county line but includes moderate fire hazard severity zones in the area of the Ave 24 Wye. All remaining portions of the alignment are located in fire hazard severity zones that are described for the UPRR/SR 99 and BNSF alternatives.

Law Enforcement

Response times to calls for law enforcement vary in the corridor. Merced County and the cities of Atwater and Merced do not track their average call response times. Chowchilla and City of Fresno police officers respond to the most urgent calls in about 6.5 minutes on average. City of Madera police officers respond to the most urgent calls within their ideal response time of 1 to 3 minutes in most cases, but the city does not track average response times. Madera County sheriff officers respond to the most urgent calls in about 18 minutes on average (Brogdon 2010, Chambers 2010, Eber 2010, Lamison 2010, McKenzie 2010, Riviere 2010, Salvador 2010).

The crime rate in Merced is lower than the state average for both violent and property crime (Federal Bureau of Investigation 2008). The violent crime rate in Fresno is higher than the state average for violent crime (14 crimes per 1,000 inhabitants in Fresno versus 5 crimes per 1,000 inhabitants in California as a whole) and higher for property crime as well. Although crime rates in Fresno are higher than state averages, the crime rate has been steadily dropping in the city, with 2008 rates the lowest since the 1970s (City of Fresno Police Department 2011). The locations of police stations and sheriff departments in the vicinity of the HST alternatives are shown in Figures 3.11-3 through 3.11-6.

Analysis of crime on board passenger trains used statistics gathered from the Los Angeles County Metropolitan Transportation Authority (MTA) and San Francisco Bay Area Rapid Transit (BART). The reported crimes include crimes committed on board trains and at transit facilities such as stations and parking lots. Compared to crime rates in the general population, crime rates on heavy rail systems in California are extremely low. Less than 1 crime occurs for every 1,000 riders on MTA lines. For every

1,000 riders on BART lines, less than 1 violent crime is committed and 2 property crimes are committed (Federal Bureau of Investigation 2008).

Emergency Medical Services

The local fire departments, emergency medical service agencies, and independent ambulance services provide emergency medical services in the study area. Five hospitals—one of which, Fresno Community Regional Medical Center, is a Level I trauma center—provide medical service to the study area. Two air ambulances operate in the study area. The Fresno Fire Department is certified as a Type 1 Heavy Rescue and Regional Response Force, with specialized rescue equipment and contracted access to additional equipment, such as industrial cranes, as needed. The Fresno Fire Department can provide Type 1 heavy rescue and regional response to emergencies throughout the entire Merced to Fresno HST corridor through mutual aid as requested. Hospitals, fire stations, police stations, and sheriff departments located in the vicinity of the HST alternatives are shown in Figures 3.11-3 through 3.11-6.

Emergency Response Plans

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 operations during emergencies such as earthquakes, floods, fires, and other natural disasters; hazardous materials spills; transportation emergencies; civil disturbance; and terrorism. The plans also identify the location of critical emergency response facilities, such as emergency dispatch and operations centers, government structures, and hospitals or other major medical facilities. Figures 3.11-3 through 3.11-6 and Appendix 3.11-A, Safety and Security Data, identify these facilities. Vital facilities that provide water, electricity, and gas are discussed in Section 3.6, Public Utilities and Energy. There are no federal or state buildings or centers in the study area.

Regionally significant roads, illustrated in Section 3.2, Transportation, Figures 3.2-1 through 3.2-4, are typically identified as emergency evacuation routes in the county and city general plans and emergency response plans. Five regionally significant roads cross the UPRR and BNSF tracks at-grade, resulting in potential delays to emergency response and evacuation if trains block the V Street/SR 140, Sandy Mush Road, Robertson Avenue/SR 233/Avenue 26, Avenue 24, and Avenue 20 crossings.

Emergency Services for Heavy Maintenance Facility Alternatives

Safety conditions at the proposed HMF sites are similar for the UPRR/SR 99, BNSF, and Hybrid alternatives. Table 3.11-4 provides information on site-specific conditions related to fire, law enforcement, and emergency medical services at the HMF alternative sites.

There are no bicycle or pedestrian facilities at any of the potential HMF sites; however, three road crossings of the existing BNSF tracks lead to the Castle Commerce Center HMF site. One accident occurred at the Buhach Road at-grade crossing, involving a collision between a freight train and a pedestrian; the accident resulted in one fatality. Other accidents have only resulted in property damage (FRA 2009a).

Table 3.11-4
Fire, Law Enforcement, and Emergency Medical Service Locations, by HMF Site

HMF Site	Closest Fire Station	Closest Police/ Sheriff Office	Closest Hospital
Castle Commerce Center	0.5 mile, Atwater Fire Department	1.5 miles, Atwater Police Department	5 miles, Mercy Medical Center, Merced
Harris-DeJager	2.5 miles, Madera County Fire Department	12 miles, Merced County Sheriff	14 miles, Mercy Medical Center, Merced
Fagundes	4 miles, Madera County Fire Department	17 miles, Madera County Sheriff	18 miles, Madera Community Hospital
Gordon-Shaw	3 miles, Madera County Fire Department	6 miles, Madera County Sheriff	6 miles, Madera Community Hospital
Kojima Development	1 mile, Madera County Fire Department	12 miles, Madera County Sheriff	13 miles, Madera Community Hospital

3.11.4.2 Community Safety

Vehicular Safety

As described earlier, highway travel is the most-used and most-hazardous transportation mode. In 2008, the California Highway Patrol reported over 3,400 fatalities and approximately 242,000 nonfatal injuries on California highways (California Highway Patrol 2008). The following factors may influence automobile and highway safety:

- Operator age, experience, ability, and other factors
- Vehicle reliability, maintenance, and crashworthiness
- Environmental considerations, including roadway conditions, weather and lighting conditions (wind, rain, fog, darkness, and sun glare), and driver distractions and interferences.

Vehicular safety issues associated with the two railroads in the study area primarily concern the conflict between motor vehicles and trains at at-grade crossings. In 2009, California ranked second for most highway-rail grade crossing collisions in the nation and first for highway-rail grade crossing fatalities. There were a total of 39 highway-rail grade crossing collisions in Merced, Madera, and Fresno counties in 2009. These collisions resulted in five fatalities (FRA 2009a).

Additional details on existing vehicular traffic conditions, including congestion and accident patterns, within the station areas for the Merced to Fresno HST Section are included in Section 3.2, Transportation, and in the *Merced to Fresno Section Transportation Technical Report* (Authority and FRA 2012).

Rail and Airports

The study area includes the UPRR and BNSF tracks. Within the study area, Amtrak provides passenger service on its San Joaquin trains, which operate on the BNSF tracks from Sacramento and Oakland to Bakersfield, with stops in Merced and Fresno. The UPRR and BNSF operate only freight trains, with the UPRR tracks having 42 public road crossings and the BSNF having 41 public crossings in the study area. Additional details on the locations of these crossings can be found in the *Merced to Fresno Section Transportation Technical Report* (Authority and FRA 2012). Appendix 3.11-B contains a list of existing railroad crossings by public and private roads.

Except for a few grade separations in Fresno, all road crossings of the UPRR and BNSF tracks in the study area are at-grade. Because SR 99 is often adjacent to the UPRR tracks, the highway right-of-way is typically fenced off from the railroad right-of-way. For the BNSF, stormwater drainage ditches provide a topographic separation between rail operations and oncoming traffic.

FRA defines a train accident as a safety-related event involving on-track equipment, whether standing or moving (FRA 2006). Accidents are categorized as derailments, collisions with other trains or vehicles, and other types of accidents that include incidents with pedestrians on the railways. According to FRA accident reports (FRA 2011), 69 train accidents, including Amtrak accidents, occurred in Merced, Madera, and Fresno counties on the UPRR and BNSF tracks between January 2004 and November 2010, including 3 accidents that resulted in 3 fatalities and 9 that resulted in 16 injuries. These accidents comprise all train accidents in the three counties, including accidents outside of the study area. Most accidents (approximately 59%) were associated with derailments, and approximately 36% of the accidents were collisions. Faulty tracks, human error, and highway-railroad crossings were the primary causes of these accidents. The following accidents occurred in the study area:

- Along the UPRR/SR 99 Alternative, 12 accidents occurred on at-grade highway crossings between January 2004 and November 2010. Three pedestrian accidents and one undefined accident at Tulare, Ventura, and Olive Streets in Fresno resulted in injuries but no fatalities. The remaining accidents involved property damage only (FRA 2011; see also Table 3.11A-3 in Appendix 3.11-A, Safety and Security Data).
- Along the BNSF Alternative, 14 accidents occurred on at-grade highway/railroad crossings between January 2004 and November 2010. A collision at Buhach Road and the BNSF tracks in Atwater resulted in one fatality, as described under the UPRR/SR 99 Alternative. Two collisions between vehicles and trains at Avenue 20½ and the BNSF in Madera County resulted in two injuries and one fatality. Four incidents were either pedestrian or undefined injury accidents in Fresno, as described under the UPRR/SR 99 Alternative. The remaining accidents involved property damage only (FRA 2011; see also Table 3.11A-3 in Appendix 3.11-A).
- Along the Hybrid Alternative, 15 accidents occurred on at-grade highway/railroad crossings between January 2004 and November 2010. A collision at Buhach Road and the BNSF tracks in Atwater resulted in one fatality, as described under the UPRR/SR 99 and BNSF alternatives. Four incidents were either pedestrian or undefined injury accidents in Fresno, as described under the UPRR/SR 99 and BNSF alternatives. The remaining accidents involved property damage only (FRA 2011; see also Table 3.11A-3 in Appendix 3.11-A).
- Adjacent to the Castle Commerce Center HMF, three accidents occurred on at-grade highway crossings between January 2004 and November 2010. A collision at Buhach Road and the BNSF tracks in Atwater resulted in one fatality, as described under the BNSF alternative. The other two accidents resulted in property damage only.

The timeframe of the accidents is approximately 6 years. Appendix 3.11-A, Safety and Security Data, provides detailed information on the train-related accidents.

Six public airports and five private airstrips operate within 2 miles of the UPRR/SR 99 Alternative, as illustrated in Figures 3.11-3 through 3.11-6 and listed in Table 3.11-5. None of the airports contains an international terminal. 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. Airports and private airstrips along the BNSF and Hybrid alternatives are the same as those for the UPRR/SR 99 Alternative, as illustrated in Figures 3.11-3 through 3.11-6, except for the airports located in Chowchilla and Madera.

The UPRR/SR 99 Alternative passes through Class B1 and Class C land use zones (see Section 3.13, Station Planning, Land Use, and Development) near the Chowchilla Municipal Airport. Class B1 land use zones generally limit the height of structures to 35 feet or less and are considered to be areas of substantial risk to land uses because of low-flying aircraft. Class C land use zones do not limit structure height and are considered to be areas of limited risk to land uses (Madera County Airport Land Use Commission 1993).

Table 3.11-5
Airports, Airstrips, and Heliports within 2 Miles of Alternative Alignment Construction Footprints

Facility	Distance from Centerline (miles)	County	Alternative Alignment
Castle Airport	0.32	Merced	Castle Commerce Center HMF
Merced Municipal Airport	1.32	Merced	UPRR/SR 99, BNSF, and Hybrid alternatives
Chapman Farms Airport	0.97	Madera	BNSF Alternative
Chowchilla Municipal Airport	0.54	Madera	UPRR/SR 99 Alternative
Sallaberry Ranch Airstrip	0.06	Madera	BNSF Alternative
Madera Airport	0.69	Madera	UPRR/SR 99 Alternative
Community Regional Medical Center Heliport	0.73	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Fresno Chandler Executive Airport	0.86	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Pacific Gas and Electric Fresno Service Center Heliport	1.32	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Sierra Sky Park Airport	1.63	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Valley Medical Center Heliport	1.93	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Sources: Airport-Data.com (2010), FAA (2010).			

Pedestrian and Cyclist Safety

According to FRA, in 2009, California ranked first in the nation in pedestrian rail-trespass fatalities, with 61 fatalities statewide. These fatalities occurred primarily from suicidal pedestrian rail trespass, followed by accidental pedestrian trespass. Between January 2004 to October 2009, 11 at-grade crossing accidents occurred within the study area. One resulted in a pedestrian fatality in Atwater, and three resulted in three pedestrian injuries in Downtown Fresno (FRA 2009a). Appendix 3.11-A, Safety and Security Data, provides information on the at-grade crossing accidents.

Most pedestrian and bicycle facilities are located in urban areas. Section 3.2, Transportation, describes existing pedestrian and bicycle traffic conditions as well as accident data. The well-connected sidewalk system in Downtown Merced meets Americans with Disabilities Act (ADA) standards, according to reconnaissance conducted in July 2009. There are sidewalks on both sides of 16th Street, and there are crosswalks for pedestrian movements at most intersections along 16th Street. There are sidewalks on other major streets in the vicinity, such as 15th Street, R Street, M Street, O Street, and G Street.

The well-connected sidewalk system in Downtown Fresno meets ADA standards in most locations, with exceptions including some blocks west of the existing UPRR tracks in Downtown Fresno that lack sidewalks or do not meet ADA standards. There are sidewalks on both sides of H Street and crosswalks for pedestrian at most intersections along H Street. There are sidewalks on other nearby major streets, such as Tulare Street and Inyo Street.

The City of Merced has a comprehensive bikeway system consisting of off-street bicycle paths, on-street marked bicycle lanes, and on-street shared-use bicycle routes (Merced County Association of Governments 2008). Three bike lanes cross the UPRR at-grade in Downtown Merced (on R Street, M Street, and G Street) and a bike route crosses the UPRR on the Childs Avenue overpass. The City of Fresno has no bicycle facilities in the station study area.

State Prisons

The California Department of Corrections and Rehabilitation (CDCR) operates the Valley State Prison for Women (VSPW) and the Central California Women's Facility (CCWF) east of Chowchilla in Madera County. The land containing these facilities is used for buildings and security facilities for the prisons (inside the secure perimeter) and agricultural lands (e.g., almond production) operated for revenue by the California Prison Industry Authority (CALPIA).

Schools

Table 3.11-6 lists the schools within 0.25 mile of the alternatives for the Merced to Fresno Section; they are shown in Figures 3.10-1 through 3.10-4 in Section 3.10, Hazardous Materials and Wastes. Schools are close to the alternative alignments in all communities except Chowchilla.

Table 3.11-6
Schools within Approximately 0.25 Mile of Alternative Alignment Construction Footprints

Facility	Distance from Footprint (miles)	City	Alternative Alignment
Merced Union High School District's Adult Center	In footprint	Atwater	Castle Commerce Center HMF
Franklin Elementary School/ Franklin Preschool	0.22	Merced	Castle Commerce Center HMF
Joe Stefani Elementary School	In footprint	Merced	Castle Commerce Center HMF
Merced Scholar's Charter	0.03	Merced	Castle Commerce Center HMF
Charles Wright Elementary School	0.27	Merced	UPRR/SR 99, BNSF, and Hybrid alternatives
Community Day School	0.25	Merced	UPRR/SR 99, BNSF, and Hybrid alternatives
Don Stowell Elementary School/ Galen Clark Preschool	0.25	Merced	UPRR/SR 99, BNSF, and Hybrid alternatives
Yosemite (Continuation)/ Independence (Alternative)/ Sequoia High School	0.15	Merced	UPRR/SR 99, BNSF, and Hybrid alternatives
Golden Valley High School	0.25	Merced	UPRR/SR 99, BNSF, and Hybrid alternatives
Merced Adult School	0.23	Merced	UPRR/SR 99, BNSF, and Hybrid alternatives
Le Grand Elementary School	0.28	Le Grand	BNSF Alternative, Mission Ave and Mariposa Way design options
Madera Community College Center	0.18	Madera	BNSF Alternative

Facility	Distance from Footprint (miles)	City	Alternative Alignment
St. Joachim Elementary School	0.27	Madera	UPRR/SR 99 Alternative
Faith Tabernacle Christian Academy	0.20	Madera	UPRR/SR 99 Alternative
George Washington Elementary School	0.23	Madera	UPRR/SR 99 Alternative
Sierra Vista Elementary School	0.20	Madera	UPRR/SR 99 Alternative
Rio Vista Middle School	0.26	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
River Bluff Middle School	0.22	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Saroyan Elementary School	0.16	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Addams Elementary School	0.02	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives
Lincoln Elementary School	0.20	Fresno	UPRR/SR 99, BNSF, and Hybrid alternatives

High-Risk Facilities and Fall Hazards

High-risk facilities (such as refineries and chemical plants) and fall hazards (such as industrial facilities with tall structures like silos and distillation columns) could pose threats to operation of the proposed project in the event of a disaster at those facilities. High-risk facilities within and near the construction footprint (see Section 3.1) are discussed in Section 3.6, Public Utilities and Energy, and Section 3.10, Hazardous Materials and Wastes. The following high-risk facilities pose explosion threats along the UPRR/SR 99 Alternative:

- The Kinder-Morgan high-pressure petroleum pipeline in the UPRR corridor.
- The Pazin & Meyers, Inc. and the Pacific Gas and Electric manufactured gas plant fuel refineries in Merced and Madera.
- Two Unocal Fresno bulk plant fuel refineries in Fresno.
- Various high-pressure gas pipelines.

The fire and rescue agencies follow their own standard emergency response protocols for industrial sites when responding to emergencies at high-risk facilities (Anderson 2010, Mitchum 2009, Moore 2009).

The stature of industrial facilities may pose a safety hazard because of the proximity of large industrial process machinery and/or tank storage, including silos and distillation columns, which are several hundred feet in height. Tall structures pose a safety hazard because of their potential to topple onto HST facilities due to accidents, severe weather, or terrorist acts. Such tall structures along the UPRR/SR 99 Alternative include the following:

- Madera County: Azteca Milling L.P. (23865 Avenue 18), Valley Grain Products (20104 Fairmead Boulevard), E & J Gallo Winery (31754 Avenue 9), and Royal Madera Vineyards (7770 Road 33).

- City of Fresno: Producers Dairy Milk Distribution (North H Street and North Harrison Street), Integrated Grain and Milling (315 North H Street), Saladino's (4397 Golden State Boulevard), El Mexicano Marquez Brothers (4393 Golden State Boulevard), Rinkers Materials Pipe Plant (4150 North Brawley), Jensen & Pilegard (1068 G Street), Warehouse (G Street / Kern Street), and Builders Concrete/River Rock Products (3664 West Ashlan).

High-risk facilities along the BNSF Alternative are the same as those discussed under the UPRR/SR 99 Alternative. However, only a portion of the BNSF Alternative includes the high-pressure petroleum pipeline along the UPRR corridor.

Industrial facilities with tall structures that could pose safety hazards along the BNSF Alternative are the same as those discussed under the UPRR/SR 99 Alternative. In addition, the following other facilities pose a risk to the BNSF Alternative:

- Madera County: Almaden Cellars Winery (22004 Road 24).
- Le Grand: Unnamed grainery/food processing facility at the southeast corner of the Le Grand Avenue/Fresno Road intersection.

High-risk facilities along the Hybrid Alternative are the same as those discussed under the UPRR/SR 99 Alternative. However, only a portion of the Hybrid Alternative includes the high-pressure petroleum pipeline along the UPRR corridor. Industrial facilities with tall structures that could pose safety hazards to the Hybrid Alternative include those discussed under the UPRR/SR 99 Alternative. In addition, the Almaden Cellars Winery located at 22004 Road 24 has tall structures that are proximate to the Hybrid Alternative.

3.11.5 Environmental Consequences

This section describes the environmental consequences and impacts related to safety and security associated with construction and operation of the HST Project. Proposed mitigation measures to address these adverse/significant impacts are discussed in Section 3.11.7, Mitigation Measures.

3.11.5.1 Overview

Operating on a fully grade-separated, dedicated track alignment using contemporary safety, signaling, and automated train control systems, the HST System would provide a safe and reliable means of intercity travel. Design of the system also would prevent conflicts with other vehicles, pedestrians, and bicyclists and allow the trains to operate year-round under different weather conditions. Overall, the HST would provide a safety benefit.

Project features, plans, and protocols developed as part of the HST Project would avoid or mitigate most adverse safety and security effects. Except for the proximity of the BNSF Alternative with the Ave 24 Wye to the VSPW, and the potential for increased emergency services demands at stations and HMFs, safety and security effects among the three HST alternatives would be similar and negligible.

The security effects associated with the BNSF Alternative with the Ave 24 Wye on the VSPW property could be reduced to negligible intensity under NEPA and less than significant under CEQA with the elimination of a roadway overpass from the Ave 24 Wye design or the potential redesign of the northbound leg of the Ave 24 Wye to move it out of the VSPW property.

The impacts of increased demand for fire, rescue, and emergency services at stations and HMFs could have substantial intensity under NEPA and be significant under CEQA. Emergency responses to incidents at stations and the HMF would be monitored. If it were determined that the HST Project increased demand for these services, a fair-share impact fee to local service providers would be negotiated, which would reduce to effects with negligible intensity under NEPA and to less than significant under CEQA.

3.11.5.2 No Project Alternative

The No Project Alternative is based on existing conditions and the funded and programmed transportation improvements and land use projects expected to be developed and in operation by 2035 (see Section 3.2, Transportation, and Section 3.19, Cumulative Impacts). It is anticipated that under the No Project Alternative, safety and security in the study area would follow current trends because transportation improvements would incorporate design features that reduce the potential for accidents and because service level goals for emergency responders would have to be met for the additional population. Therefore, no adverse or significant impacts on accident prevention or emergency response are anticipated. Crime rates depend, in part, on economic conditions and, therefore, predictions are speculative.

<u>Safety</u>

Existing safety conditions related to motor vehicles, pedestrians, and bicyclists would not change under the No Project Alternative. With the exception of the new grade separation at G Street and the BNSF tracks in Merced, emergency responders would continue to experience delays throughout the study area at numerous at-grade crossings of the UPRR and BNSF when trains block crossings. The demand for law enforcement, fire, and emergency services would change commensurate with anticipated population growth and implementation of the development projects, which include residential subdivisions, quarries, and shopping centers (see Section 3.19, Cumulative Impacts).

<u>Security</u>

Under the No Project Alternative, existing emergency response plans and procedures would not be affected. Emergency responders and evacuees would continue to experience delays at numerous at-grade crossings of the UPRR and BNSF when trains block crossings. Conditions related to airports, critical facilities, state prisons, and high-risk facilities in the study area would not change as a result of planned future projects.

3.11.5.3 High-Speed Train Alternatives

<u>Construction Period Impacts</u>

Construction of an HST alternative could result in accidents at construction sites and in temporary increases in risks to motor vehicle, pedestrian, and bicycle safety from traffic detours, as well as increased response times by law enforcement, fire, and emergency services personnel.

Common Safety Impacts

Accident Prevention during Construction

Safety of construction workers and the public could be compromised during construction, potentially resulting in accidental injuries and deaths. Standard implementation of a construction safety and health plan during construction would reduce risks to human health during construction and, therefore, impacts would have negligible intensity under NEPA and would be less than significant under CEQA under all alignment and HMF alternatives.

Detours around Construction Sites

As discussed in Chapter 2, Alternatives, and shown in Appendix 2-A, roads would either be closed or grade-separated where they cross the HST alignment. Grade separations would typically be road overcrossings. In some locations, a detour would be built around the section of road to be rebuilt, and the overcrossing would be constructed on the existing roadway alignment. After completion of construction, traffic would be routed back to the overcrossing, and the detour would be removed.

In other locations, the overcrossing would be built adjacent to the existing roadway and, when completed, traffic would be routed to the overcrossing and the original roadway segment would be removed. In these cases, lane closures would be required but would only last a few hours when the final connections to the road overcrossing or detour were made. Because the lane closures would be only a few hours, traffic would not be hampered and emergency response times would not increase; therefore, the resulting effects would have negligible intensity under NEPA and would be less than significant under CEQA.

In some cases, it would be necessary to build an overcrossing at the same location as the existing road and to detour traffic onto other roads. The realignment of SR 99 in Fresno between Ashland and Clinton Avenues would also require some road closures and detours. Road closures would typically last 8 to 10 months, and in some cases up to 18 months. Lane closures and detours could distract automobile drivers, pedestrians, and cyclists. Distraction and unfamiliarity with detours could lead to accidents. In addition, the road closures, detours, and localized automobile congestion could increase the response time for law enforcement, fire, and emergency services personnel. Emergency evacuation times could also increase.

The project design features would include development of a detailed construction transportation plan that would involve coordination with local jurisdictions on emergency vehicle access. The plan would also include a traffic control plan that addresses temporary road closures, detour provisions, allowable routes, and alternative access. Because the project would implement a construction transportation plan and associated traffic control plan, resulting effects would have negligible intensity under NEPA and would be less than significant under CEQA under all alignment and HMF alternatives.

Accidents and detours during construction could occur as described below.

UPRR/SR 99 Alternative

The UPRR/SR 99 Alternative would affect motor vehicle, pedestrian, and bicycle safety during construction, as described above. Several modifications to SR 99 interchanges and overcrossings, as listed in Section 3.2, Transportation, may result in lane closures or detours. As noted in Section 3.2, Transportation, the duration of these impacts could range from several hours in the case of a freeway closure to months in the case of lane-width reductions or detours. Because the project would implement a construction transportation plan and associated traffic control plan, resulting effects would have negligible intensity under NEPA and would be less than significant under CEQA under all alignment and HMF alternatives.

BNSF Alternative

Because the BNSF Alternative would pass through smaller urban areas outside of Merced and Fresno than those identified for the UPRR/SR 99 Alternative, there would be slightly fewer drivers, pedestrians, and bicyclists who would experience safety risks related to detours around construction areas. The Mission Ave East of Le Grand and Mariposa Way East of Le Grand design options would present the smallest safety risk because they would avoid Le Grand entirely. Because the project would implement a construction transportation plan and associated traffic control plan, resulting effects would have negligible intensity under NEPA and would be less than significant under CEQA under all alignment and HMF alternatives.

Hybrid Alternative

The Hybrid Alternative would avoid urban areas such as Chowchilla and Madera, but would travel through the cities of Merced and Fresno. Therefore, the safety risks for drivers, pedestrians, and bicyclists would be similar to those associated with the BNSF Alternative. Because the project would implement a construction transportation plan and associated traffic control plan, resulting effects would have negligible intensity under NEPA and would be less than significant under CEQA under all alignment and HMF alternatives.

Heavy Maintenance Facility Alternatives

Construction of an HMF would not result in any safety-related impacts beyond those already discussed under the UPRR/SR 99, BNSF, and Hybrid alternatives.

Common Security Impacts

Criminal activity around HST construction sites would be typical of the types of crimes that occur at other heavy construction sites, such as theft of equipment and materials or vandalism after work hours. Construction contractors would institute security measures common to construction sites, including securing equipment and materials in fenced and locked storage areas and the use of security personnel after work hours. Because of these construction security measures, resulting effects would have negligible intensity under NEPA and would be less than significant under CEQA for all alignment and HMF alternatives.

State Prisons

Construction of the BNSF Alternative with the Ave 24 Wye and the Hybrid Alternative with the Ave 24 Wye would be on CDCR property and, therefore, near the secure perimeter of the VSPW and the CCWF. CDCR has expressed concerns about potential effects from dust, utility relocation, and noise on the prison facilities and operations during construction (CDCR 2011). Although construction activities would be taking place in close proximity, they would present little potential to disturb the prisons' daily operational stability and security protocol because construction activities would not require access through the secure perimeter of the prisons. Construction activities would be occurring approximately 1,000 feet from the nearest building of the VSPW and 2,000 feet from the nearest building at the CCWF. Construction activities would be coordinated with CDCR to reduce the risk of upsetting prison operations. Because of the distances involved, construction operations are considered to have a low potential to disrupt prison operations and, therefore, the effect is considered to have negligible intensity under NEPA and to be less than significant under CEQA.

<u>Project Impacts</u>

Common Safety and Security Impacts

As described in Chapter 1, Purpose & Need, and Section 3.2, Transportation, projected growth in the movement of people and goods by automobile, air, and rail over the next two decades underscores the need for improved travel safety. With travel demand projected to outpace future highway capacity, there are likely to be increased travel delays. Roadway congestion, limited airport capacity, passenger train delays, and a growing intercity travel market will adversely affect the travel-time reliability of all modes of travel. In addition, poor weather conditions (such as rain, wind, and dense Central Valley fog) also adversely affect the reliability of highway travel times.

Operating on a fully grade-separated, dedicated track alignment using contemporary safety, signaling, and automated train control systems, the HST System would provide a safe and reliable means of intercity travel. Design of the system also would prevent conflicts with other vehicles, pedestrians, and bicyclists and allow the trains to operate year-round under different types of weather conditions. Overall, the HST would provide a safety benefit.

Although there would be many benefits, HST operation also could result in impacts on public, passenger, and employee health and safety, such as increased response time by law enforcement, fire, and emergency services personnel. As discussed in Section 3.11.6, Project Design Features, project design would reduce the risks to human health. Some system safety and security measures, such as fencing along the track, also would reduce the risk of non-accidental events, such as suicide attempts.

Safe and efficient HST System operation would include the establishment of an Operations Control Center (OCC), which would retain operational control of all train movements along tracks and to stations, maintenance, and storage facilities at all times. The OCC would operate and maintain a comprehensive communications system that would allow for wireless communications between the OCC, trains, and system staff for routine operations and in emergency situations.

Train Accidents

The types of accidents that could be associated with an HST can be broken down into train-to-train collisions, collisions between an HST and objects entering the HST corridors such as vehicles from adjacent highways or trains from adjacent freight lines, and HST derailments. These types of accidents are discussed below.

Train-to-train Collisions

Current practice in the United States to ensure safety of passengers in the event of a conventional train-to-train collision is to provide locomotives with sufficient weight and strength to protect the trailing passenger cars. This approach is sometimes referred to as *crashworthiness* because both of the lead vehicles or locomotives are designed to withstand the impact of a collision. If applied to all trains, this approach ensures that trains would be of like weight and strength and the impact would be distributed equally to the two trains involved in a collision. The result is a safer operating environment with a very heavy lead vehicle.

Design of HST systems takes a different approach for ensuring safety of passengers from a train-to-train collision. This approach is known as *collision avoidance*. HST systems take advantage of a *system design approach* in which the HST, the automatic train control system, the electrification system, and the rail infrastructure includes automation that can control or stop the trains without relying on human involvement. The general approach for the automatic train control system is to monitor the location and speed of all trains on the high-speed network and to coordinate and maintain enough physical separation to allow safe braking. If a fault occurs (such as an intrusion, derailment, or significant natural event) within the HST network, the automatic train control system can slow or stop the train and minimize or eliminate a potential hazard. In areas of high risk, the system design approach can also provide protection from other intrusions into the HST corridor, such as errant automobiles, trucks, or other unauthorized entry, by the use of intrusion detection and other monitoring equipment to detect a fault and initiate action as needed (Authority 2008; U.S. Department of Transportation and FRA 1993).

The system design approach using a collision avoidance philosophy has proven to be very effective in maintaining passenger safety in both Asian and European HST systems. In more than 40 years of operation in Japan and more than 25 years of operation in Europe, there have been no reported passenger fatalities resulting from a train-to-train collision on an HST dedicated track network that has applied a system design approach to provide passenger and worker safety. As a result of implementing this system design approach, the direct effects from train-to-train collisions are not expected to occur, and there would be no impact under NEPA and less than significant under CEQA (Rao and Tsai 2007).

Collisions with Vehicles or Other Trains Entering the HST Corridor

Safety considerations are also included in the design of the HST alignments with regard to proximity of the HST line to other transportation facilities, including other railways or highways. The primary safety concern is a derailed train or errant vehicle entering the HST corridor and fouling the line. Because a portion of the Merced to Fresno Section of the HST System would operate adjacent to either the UPRR or the BNSF railways, depending on the alternative selected, there is a risk of a conventional passenger or freight train derailing, entering the HST trackway, and obstructing or colliding with an HST. Safety can be achieved where there is sufficient horizontal or vehicle separation between these facilities, or by use of a physical barrier to separate the facilities (Authority 2008 and FRA 1994).

As described in Chapter 2, Alternatives, there would be either (1) a minimum separation between the HST and adjacent UPRR or BNSF trackways (i.e., 100 feet between HST trackway centerline and UPRR edge of right-of-way or 102 feet between the centerlines of HST and BNSF trackways), or (2) where a railroad line is less than the minimum separation from an HST track and both are at ground level, additional protection may be required, including the use of earthen berms, swales, or a physical barrier. The minimum separation distance (i.e., 102 feet between centerlines of tracks) includes the distance of the maximum practical excursion of the longest U.S. freight rail car from the center of track, plus an allowance for overhead catenary system (OCS) masts. A car body length of 89 feet for the freight rail car displacement plus an allowance of 12.5 feet to include an OCS mast foundation results in a minimum separation distance, without an intrusion protection barrier, of 101.5 feet, rounded to 102 feet. As stated in Chapter 2, when separations are less than 102 feet, the barrier would include a swale, and separations of less than 73 feet would require a barrier or engineered wall to withstand train intrusions.

These separation requirements, described in Technical Memorandum 2.1.7 - Rolling Stock and Vehicle Intrusion Protection for High-Speed Rail and Adjacent Transportation Systems (Authority 2008), were developed specifically for the HST and do not directly adopt existing criteria for separation requirements. The guidance for intrusion protection generally follows the recommended practices described in the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual and the design standards developed specifically for the construction and operation of HSTs, based on international practices. This includes technical guidance from National French Railways for separation between HST system and roadway infrastructure and International Union of Railways Codes for Structures Built over Railway Lines. For intrusion from highways/roadways and protection of highway motorists, the design guidance follows FRA recommendations and was revised to be compliant with Caltrans Highway Design Manual, which was updated in 2011 to specifically address separation requirements for HST facilities adjacent to the state highway system.

The need for and type of protection is subject to the distance between tracks and the risk of a derailment. Barriers between the HST and freight rail lines are shown in Volume III, Alignments and Other Plans.

Historically, train derailments in the United States have generally occurred where there is special trackwork, such as turnouts and crossovers, or where a rail network may not have been adequately maintained at the authorized speed.

When an HST track is adjacent to a highway or roadway, a barrier is typically required where the roadway is less than 30 to 40 feet from the HST access control fence. Depending on the highway facility, the barrier can range from a standard concrete barrier to a taller barrier that protects against errant commercial trucks and trailers. Where the separation is greater than 30 to 40 feet, barriers may be considered, subject to a risk assessment.

Vertical separation—where one of the transportation facilities is on a viaduct and the other is at ground level—can also provide protection from intruding vehicles into the HST right-of-way. Consistent with standard railroad practice, where the HST track would be on a viaduct, the adjacent facilities should be at least 25 feet from the nearest supporting column face. Where 25 feet of clearance is not available, a barrier may be required to protect the supporting columns. As a result of implementing standard design practices, the potential intrusion of motor vehicles or trains into the HST corridor would have negligible intensity under NEPA and impacts would be less than significant under CEQA.

Train Derailment

A basic design feature of an HST system is to contain train sets within the operational corridor. Strategies to ensure containment include operation and maintenance plan elements that would ensure high-quality tracks and vehicle maintenance to reduce the risk of derailment. Also, physical elements, such as containment parapets, check rails, guard rails, and derailment walls, would be used in specific areas with a high risk of or high impact from derailment. These areas include elevated guideways and approaches to conventional rail and roadway crossings (Authority 2008). An overview of significant HST derailments worldwide found that most derailments resulted in trains maintaining their alignment with the track due to the types of system elements described above (Authority 2012).

Figure 3.11-7 shows an example of concrete derailment walls and containment parapets on an elevated section of an HST in Taiwan. The concrete derailment walls are like tall curbs that run close to the train wheels. In the event of a derailment, these walls keep the train within the right-of-way and upright. Figure 3.11-8 shows a derailed HST and how it is prevented from leaving the right-of-way. This photograph shows a train that derailed in Taiwan in March 2010 after an earthquake. The train was traveling 175 miles per hour when the railway earthquake sensors picked up seismic movements. The traction power supply was automatically cut, and the on-board automatic train protection system was instructed to bring the train to an emergency halt. As a result of the lateral seismic movements during the earthquake, the train jumped the track but as designed, the train bogies were contained by the derailment wall alongside the track.

Any derailment of an HST or a train on an adjacent freight rail corridor would trigger automatic shutdown of the HST. Because of the speed of the HSTs, a trainset could require up to 5 miles to stop, and could potentially stop next to a derailed train. The likelihood of this occurrence is low. However, if an HST set did stop next to a derailed train, the physical containment elements on the HST system, and the separation of the HST system from adjacent freight rail corridors, would prevent a derailed train from entering the HST track. As a result of implementing these standard design practices, the potential for HST derailments would have negligible intensity under NEPA and impacts would be less than significant under CEQA.

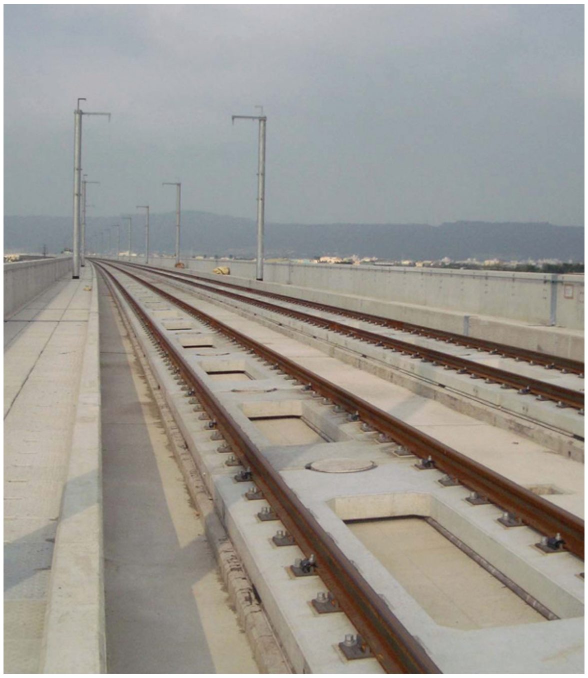


Figure 3.11-7
Derailment Wall and Parapet

As described in Section 3.11.1, an HST derailment in Germany in 1998 resulted in substantial deaths and injuries. The accident could have been prevented by proper maintenance of the train and installation of the containment elements described above (NEWI 2004, NASA 2007).

Motor Vehicle, Pedestrian, and Bicycle Safety

The project design accounts for motorist safety in several ways, including HST grade separation from automobile traffic. The HST tracks would be located in a dedicated right-of-way, eliminating potential conflict with other trains (such as freight trains) or other vehicles. Because the HST tracks would be located in dedicated right-of-way, the project would have no impact under NEPA and less than significant impacts under CEQA on motor vehicle safety.

Figure 3.11-8
HST Derailment

Roadway improvements included in the project, such as overpass construction (see Chapter 2, Alternatives), could improve vehicular safety through associated street widening, traffic restrictions, and/or new traffic signals. The HST tracks would be grade-separated, and the roadway improvements near the stations and along the alignment would comply with design standards for pedestrian and bicycle safety. As a result of HST grade separation and compliance with design standards, the project would have beneficial effects on pedestrian and bicycle safety.

The site design for the HMF would follow safety design standards, and onsite traffic routing would comply with federal and state rules for vehicular movement. As a result of compliance with design standards and federal and state rules, HMF operations would have less than significant impacts related to motor vehicles, pedestrians, and bicycles.

Seismic Safety

Sections of the HST alignment and infrastructure would be located in seismically sensitive areas, and therefore would be constructed to specifications capable of withstanding defined levels of seismic activity without incurring structural failure. As discussed in Section 3.9, Geology, Soils, and Seismicity, because the project design features would meet specifications contained in AASHTO guidance, FHWA guidance, the AREMA manual, Caltrans design standards, California Building Code, and International Building Code accounting for seismic activity, the resulting potential effects would have negligible intensity under NEPA and would be less than significant under CEQA.

In addition to structural design features, the HST System would implement operational procedures to protect passenger and employee safety. The HST would also have a seismic monitoring system of sensors that would automatically stop trains approaching areas of seismic activity in order to minimize the possibility of a derailment due to a seismic event. The monitoring system would be connected to an alert warning system at the OCC, so that OCC staff and train crews could take action to reduce the impact of a seismic event (Authority 2010). Following a seismic event, inspections of track, structures, bridges, and other system elements would be a priority, and the necessary repairs and operational precautions, such as service suspension or speed restrictions, would be implemented as necessary and prudent.

Fire Safety

The HST alternatives would include project elements that have a potential risk of fire and related hazards: station facilities, passenger vehicles, maintenance facilities with fuel storage, traction power and paralleling stations, and the OCC. These elements have electrical equipment and/or combustible materials and thus represent a fire and explosion risk. The project design includes fire warning and suppression systems, such as sprinklers, as well as emergency exits and notification systems, consistent with the requirements of the NFPA Life Safety Code and Standard for Fixed Guideway Transit and Passenger Rail Systems, the California Building Standards Code, and the International Building Code. With implementation of these design features and the standard operating provisions listed in Section 3.11.6, Project Design Features, the risks to human health resulting from fire and explosion would have negligible intensity under NEPA and would be less than significant under CEQA.

Fire, Rescue, and Emergency Services – Permanent Road Closures and Increased Response Times

Road closures and modified traffic routing along HST tracks could result in increased response times for emergency responders. As discussed in Section 3.2, Transportation, existing roads would either remain unchanged where elevated tracks would cross them or would be modified into overcrossings where at-grade tracks would conflict with them. Road crossings in rural areas would occur approximately every 2 miles. Section 3.2.5, Transportation Environmental Consequences, states that limited traffic impacts are expected as a result of the closures and diversion of traffic. Because the project design would include coordination with emergency responders to incorporate roadway modifications that maintain existing traffic patterns and fulfill response route needs, effects on the response times by service providers would have negligible intensity under NEPA and would be less than significant under CEQA.

Fire, Rescue, and Emergency Services – Emergency Access to Elevated Track

The HST design would include elevated tracks as high as 85 feet above ground level (see Chapter 2, Alternatives), which could be difficult to evacuate and difficult to reach by emergency responders in case of emergencies during which a train is stopped. The elevated track portion would include a walking surface and a lateral safety railing, in accordance with standard engineering design requirements (NFPA 2001). The design also would include ground access from the elevated tracks, allowing for emergency passenger evacuation if needed, as well as for routine track maintenance.

As discussed in Section 3.11.6, Project Design Features, the emergency response along elevated tracks would be conducted swiftly and efficiently. Incorporation of design features, including tracks designed to facilitate safe evacuation of individuals, would reduce the potential for delayed or hampered response to emergencies on elevated track portions to negligible intensity under NEPA and to less than significant under CEQA.

UPRR/SR 99 Alternative

Because the UPRR/SR 99 Alternative would travel directly through south Merced County, Chowchilla, and Madera, it would require more aerial structures than the BNSF or Hybrid alternatives.

BNSF Alternative

The BNSF Alternative would require fewer aerial structures in south Merced County than would be necessary for the UPRR/SR 99 Alternative. The BNSF Alternative would avoid the urban areas of Chowchilla and the City of Madera.

Hybrid Alternative

The total length of elevated track for the Hybrid Alternative would be less than for the UPRR/SR 99 and BSNF alternatives. Like the latter, it would avoid the urban areas of Chowchilla and the City of Madera.

Heavy Maintenance Facility Alternatives

The HMF tracks accessing the far main track would be elevated to cross the near track (see Chapter 2.4.6, Proposed Heavy Maintenance Facility Locations).

Fire, Rescue, and Emergency Services – Need for Expansion of Existing Facilities

As discussed above, project design features have minimized the potential for train accidents; therefore, local response to accidents is not expected to be required because any incident would be extremely rare. As noted in Section 3.11.1, HST systems are one of the safest modes of passenger travel in the world. For emergency preparedness, however, the Authority would collaborate with local responders to develop a Fire and Life Safety Program for emergency response in case of an accident or other emergency (see Section 3.11.6, Project Design Features). Because the project has been designed to avoid accidents, average response times are not expected to change, and new or physically altered government facilities that would create physical impacts on the environment are not anticipated, resulting in no impact under NEPA or CEQA.

As described in Section 3.12, Socioeconomics, Communities, and Environmental Justice, and Section 3.13, Station Planning, Land Use, and Development, the Downtown Merced and Downtown Fresno stations would introduce new activity centers into the downtown areas. These economic impacts would be beneficial because the stations would help implement local goals for downtown redevelopment and revitalization. In this manner, however, the associated redevelopment and economic activity that would indirectly result from the presence of the HST stations could increase demand for local emergency responders and require new or physically altered government facilities (such as police or fire stations) that might affect the environment. Any redevelopment near the Downtown Merced or Downtown Fresno stations would follow the cities' site development and building permitting processes, including the payment of impact fees that support capital costs for new or expanded government facilities. Any new or expanded government facilities would be designed and constructed to be consistent with local land use plans, and would be subject to separate site-specific analysis under CEQA. The indirect effects of redevelopment in station areas would have negligible intensity under NEPA and would be less than significant under CEQA, because redevelopment and expanded facilities would comply with local site development and permitting processes, including impact fees and CEQA analysis.

The stations themselves would introduce new passengers into the cities, especially in Merced during Phase 1 operation, which could increase the demand for fire and ambulance services. Because the stations would have onsite security patrols, no increased demand for police protection is anticipated. Increased economic activity around stations would result in increased property and sales tax revenues to help offset costs of additional service demands. However, the impact on emergency response could have moderate intensity under NEPA and could be significant under CEQA.

Development of an HMF alternative in the project vicinity (including the OCC) could increase the demand for fire and ambulance services. Because the HMFs would have controlled access with onsite security, no increased demand for police protection is anticipated. These emergency services are expected to be provided from existing facilities, as follows:

- Castle Commerce Center HMF Alternative: Existing services provided by the City of Atwater at Castle Commerce Center and in the City of Atwater, and by the City of Merced in the Franklin area
- Harris-DeJager, Fagundes, and Kojima Development HMF Alternatives: Existing services provided by the City of Chowchilla
- Gordon-Shaw HMF Alternative: Existing services provided by the City of Chowchilla and the City of Madera

This is an impact with moderate intensity under NEPA and a potentially significant impact under CEQA. If new fire and/or ambulance emergency response facilities are needed, the Authority and the local providers could agree to develop emergency response capacity at the HMF sites.

Security Deterring Criminal Acts and Terrorist Attacks

Criminal activity, such as theft and violence, could occur on trains and at station facilities. Terrorists could target the stations, tracks, or trains for the potential to inflict mass casualties and disrupt transportation infrastructure. The HST design would include access control and security monitoring systems, which would deter such acts and facilitate early detection. These systems would also help to prevent suicide attempts. The system features include sensors on perimeter fencing, closed-circuit television, and security lighting where appropriate (Authority 2008; Authority 2011a). These system features would reduce the potential for successful criminal and terrorist acts to effects with negligible intensity under NEPA and to less than significant impacts under CEQA.

Airports and Private Airstrips

Proximity of the HST facilities to an existing airport or airstrip could endanger human health if an airplane crashed into the HST facilities or if the HST Project interfered with airport operations. Therefore, if conflicts with airports and private airstrips occurred, they would be effects with substantial intensity under NEPA and a significant impact under CEQA. The safety impacts of the alternatives in relation to adjacent airports have been analyzed considering the guidance provided in the *Airport Land Use Planning Handbook* (Caltrans Division of Aeronautics 2002). The potential of electromagnetic interference from the HST System with adjacent facilities is discussed in Section 3.5, Electromagnetic Fields and Electromagnetic Interference.

HST Alternatives

The UPRR/SR 99 Alternative and the Hybrid Alternative in combination with the Ave 24 Wye would cross the UPRR track just over 1 mile south of the Chowchilla airport. The project design would avoid penetrating the land use zones associated with the airport (Madera County Airport Land Use Commission 1993). The BNSF and Hybrid alternatives with the Ave 21 Wye would require acquisition of a private airstrip. Because the airstrip would be acquired, there would be no safety impacts under NEPA, and impacts under CEQA would be less than significant.

Heavy Maintenance Facility Alternatives

Two HMF sites would be located within 2 miles of an airport or private airstrip. The Castle Commerce Center HMF site would be immediately adjacent to the Castle airport, and the Gordon-Shaw site would be approximately 1 mile south of a private airstrip. Even though it is adjacent to the Castle airport, the Castle Commerce Center HMF site is outside of any airport land use zones that have height or land use restrictions found in the *Merced County Airport Land Use Compatibility Plan* (Merced County Airport Land Use Commission 1999). Because no airports would be affected by any of the HMF alternatives, there would be no safety impacts under NEPA, and impacts under CEQA would be less than significant.

Hazards from Nearby Facilities

The height and type of industrial facilities near HST facilities may pose a safety hazard because they include silos and distillation columns that are several hundred feet in height. Tall structures pose a safety hazard because of their potential to topple onto HST facilities, or to affect them because of explosions resulting from accidents, severe weather, or terrorist acts.

Building codes and safety regulations are in place to ensure the safe construction and operation of industrial facilities in the Central Valley. For these reasons, the probability is low of a catastrophic industrial accident resulting in substantial offsite consequences occurring adjacent to the HST alignment as a train is passing by. Many tall structures, such as silos and elevators, are adjacent to railroads and highways throughout the Central Valley, including those along the HST alternative alignments described above. No information is available that indicates that any of these facilities have undergone a catastrophic failure in the past several decades, let alone a failure that toppled the structure onto a transportation corridor. Propane, bulk fuel, and bulk chemical storage facilities are also located throughout the industrial portions of communities in the Central Valley, many of which are adjacent to railroads and highways. There have been no recent incidents from these facilities involving explosions or catastrophic failures that have resulted in offsite injuries or property damage. Because the likelihood of a catastrophic industrial accident adjacent to the HST alignment is low, the hazards from nearby facilities are considered to have negligible intensity under NEPA and to be less than significant under CEQA. Sections 3.10, Hazardous Materials and Waste, and 3.6, Public Utilities and Energy, provide additional information on nearby facilities. Should an incident occur adjacent to the HST alignment, appropriate measures would be taken to minimize risk to passengers and employees.

State Prisons

Implementation of the BNSF Alternative with the Ave 24 Wye would affect the VSPW and the CCWF by encroaching on the prison property. CDCR expressed safety concerns regarding the proximity of HST facilities and a proposed overpass on the prison facilities' security (CDCR 2011).

BNSF Alternative

The roadway overpass of the at-grade HST alignment at Road 21, near the VSPW property boundary, is associated with the northbound leg of the BSNF Alternative with the Ave 24 Wye. The overpass would provide an elevated vantage point for anyone intending to disrupt prison operations and security. The distance between the overpass (including public access to it) and the prison operations provide challenges for prison security personnel for monitoring activities on the overpass and to prevent any disrupting activities. Threats to prison security would be effects with substantial intensity under NEPA and significant impacts under CEQA.

The southbound leg of the BNSF Alternative with the Ave 24 Wye would be approximately 2,000 feet from the nearest CCWF building. At this distance, the potential for disruption of prison operations from train accidents is lower. The placement of the alignment would affect a portion of the agricultural property operated by the prison and could affect the prison's ability to expand adjacent wastewater treatment facilities and operations in the future. Because the potential for disruption of prison operations from train accidents is low, the impact on security is considered to have negligible intensity under NEPA and to be less than significant under CEQA. The Authority would compensate the CDCR for any acquisition of CCWF property by following the requirements of the Uniform Act and/or through the provision of additional land adjacent to the existing CCWF property.

Hybrid Alternative

The Hybrid Alternative with Ave 24 Wye would follow the same alignment as the southbound leg of the BNSF Alternative with the Ave 24 Wye; therefore, the security risk is the same as described for the BNSF Alternative.

Hazards to Schools and Residences

As indicated in Table 3.11-6, 13 schools are located within 0.25 mile of the BNSF Alternative alignment; 15 schools are located within 0.25 mile of the UPRR/SR 99 Alternative alignment; and 11 schools are located within 0.25 mile of the Hybrid Alternative alignment. The alignments also are within one to two blocks of residential areas in Atwater, Merced, Le Grand, Chowchilla, Fairmead, Madera, Madera Acres, and Fresno. Derailment of a train during a seismic event or other natural disaster could be a substantial safety hazard to these schools and residential neighborhoods if the train were to leave the HST right-of-way and collide with other structures or people on adjacent properties.

As discussed above, a basic design feature of an HST system is to contain trainsets within the operational corridor. Therefore, if a derailment were to occur adjacent to a school or in a residential area, the train would remain within the HST right-of-way. Because the train would be contained within HST right-of-way, the proposed project would not substantially increase hazards to nearby schools, and resulting impacts would have negligible intensity under NEPA and would be less than significant under CEQA.

Hazards from Flooding

The western portion of the Sierra Nevada is the site of many large dams that impound the waters of most of the west-flowing rivers that enter California's Central Valley. These dams provide water for irrigation, drinking, recreation, and flood control. As discussed in Section 3.9, Geology, Soils, and Seismicity, failure of dams located on Bear Creek, on Owens Creek, near Deadman Creek, on the Chowchilla River, on the Fresno River, and on the San Joaquin River could inundate the HST alignment, putting people traveling on the train at risk.

The California Water Code entrusts the regulation of large dams to the Department of Water Resources (DWR). DWR created the Division of Safety of Dams (DSOD) to administer the dam safety program. DSOD's mission is: "To protect people against loss of life and property from dam failure." DSOD imposes dam safety guidelines on all large dams within California, including all the dams mentioned previously. DSOD engineers inspect more than 1,200 dams each year to ensure they are performing and being maintained in a safe manner. These inspections include a thorough review of operational records as well as site inspections of the dams and abutments, outlet works, spillways, and other critical structures. If deficiencies or potential problems are identified, interim remedial measures are typically directed, such as lowering the lake level until permanent repairs, if needed, can be designed and implemented. Dam owners must submit any proposed structural or operational changes to DSOD for review and approval before they can be implemented. Because of this dam safety program, the potential risk of inundation of the HST due to dam failure is considered to be small. Therefore, the effects of this hazard are considered to have negligible intensity under NEPA and impacts would be less than significant under CEQA.

3.11.6 Project Design Features

Project design would incorporate engineering measures and best management practices based on federal and state regulations and on Program EIR/EIS documents. The standard engineering design guidelines and regulatory requirements include the following:

- Final design includes development of a detailed construction transportation plan that would involve coordination with local jurisdictions on emergency vehicle access. The plan would also include a traffic control plan that addresses temporary road closures, detour provisions, allowable routes, and alternative access.
- Engineering design and construction phases include preliminary hazard analysis, collision hazard analysis, and threat and vulnerability assessment methods.
- Preliminary hazard analyses follow the U.S. Department of Defense's System Safety Program Plan Requirements (MIL-STD-882D) (U.S. Department of Defense 2000) to identify and evaluate the facility hazards and vulnerabilities so that the design can address and either eliminate or minimize them.
- Threat and vulnerability assessments establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations. Provisions include security education and employee training specific to terrorism awareness, right-of-way

fencing, intrusion detection, closed-circuit televisions, and other design features to reduce criminal and terrorist activities. Intrusion detection technology could also alert to the presence of inert objects, such as toppled tall structures or derailed freight trains, and could stop HST operations to avoid collisions.

- Construction Safety and Health Plans (CSHPs) establish the minimum safety and health guidelines for contractors of, and visitors to, construction projects. CSHPs require contractors to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites.

- Fire/Life Safety Programs (FLSPs) implement the requirements set forth in the Federal Rail Safety Act. FLSPs address the safety of passengers and employees during emergency response. The FLSP also would address the needs of disabled persons. An FLSP is coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes.

- System Security Plans address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections. Adequate space would be provided along at-grade sections of the alignment to allow emergency response access. Ground access would be available from elevated tracks where access to ground equipment is required. This ground access could be used in the event of an emergency. Additional ground access would be considered, consistent with fire and rescue procedures and where practical operational standards include a system-specific police force.

- Standard operating procedures and emergency operating procedures include industry best practices, such as the FRA-mandated Roadway Worker Protection Program. They address the day-to-day operation and emergency situations to maintain the safety of employees, passengers, and the public.

- System Safety Program Plans (SSPPs) incorporate FRA requirements and are implemented upon FRA approval. These plans are based on the principles outlined in *The Manual for Development of System Safety Program Plans for Commuter Railroads* (American Public Transportation Association 2006) and address project design, construction, testing, and operation.

- Rail systems must comply with *Highway-Rail Grade Crossing Guidelines for High-Speed Passenger Rail* (FRA 2009b) and future safety regulations the FRA develops for high-speed passenger rail.

- Worker safety in the workplace is generally governed by the Occupational Health and Safety Act of 1970, which established the Occupational Safety and Health Administration (OSHA). The State of California, under an agreement with OSHA, operates an occupational safety and health program in accordance with Section 18 of the Occupational Safety and Health Act of 1970.In California, OSHA enforcement of workplace requirements is performed by Cal OSHA. Under Cal OSHA regulations, as of July 1, 1991, every employer in California must establish, implement, and maintain an injury and illness prevention program.

- HST urban design guidelines (Authority 2011b) require implementing the principles of crime prevention through environmental design. This is a design method that focuses on reducing opportunities for crime through the design and management of the physical environment. Four basic principles of crime prevention through environmental design would be considered during station and site planning: territoriality (designing physical elements that express ownership of the station or site); natural surveillance (arranging physical features to maximize visibility); improve sightlines (provide clear views of surrounding areas); and access control (physical guidance of people coming and going from a space).

3.11.7 Mitigation Measures

The Authority has considered avoidance and minimization measures that are consistent with commitments in the Program EIR/EIS documents. The following mitigation measures will apply to reduce substantial adverse environmental impacts resulting from implementation of the HST Project.

S&S-MM#1: Revise design to avoid safety risk to correctional facilities from roadway overpass. The Authority will relocate the alignment as shown in Figure 3.11-9.

The following discussion describes the alternate modified alignment (alternate mitigation alignment) and compares it to the proposed alignment.

The alternate mitigation alignment would avoid CDCR property. Between Avenue 24 and Santa Fe Drive, the alternate mitigation alignment would extend adjacent to and northwest of the proposed alignment for an approximate distance of 5 miles, which is 0.75 mile shorter than the proposed alignment and uses approximately 100 fewer acres. The alternate mitigation alignment would traverse 182 acres of agricultural land and 9 acres of rural residential land compared to the 287 acres of agricultural land and 7 acres of rural residential land that the proposed alignment would affect. Both alignments would convert agricultural land uses to transportation use.

No new sensitive receptors or roadway closures would be associated with the alternate mitigation alignment, so the project impacts associated with air quality, noise, and visual resources would be similar to those of the project alignment. Because the alternate mitigation alignment is shorter and would affect fewer acres, construction effects on air quality would be slightly reduced. To maintain traffic flow, the alternate mitigation alignment would have two overpasses—one at Avenue 24 near Road 19½ and the other at Avenue 26 near Road 22. The overpasses are at a sufficient distance from the prison facilities so they would not pose a security threat. The revised alignment would traverse the same habitat associated with the Berenda Slough and Ash Slough because the alignment configurations converge with Santa Fe Drive at the same location. Project impacts associated with biological resources, water resources, and hydrology would be the same as those for the proposed alignment.

S&S-MM#2: Monitor response of local fire, rescue, and emergency service providers to incidents at stations and the HMF and provide a fair share of cost of service. Upon approval of the Merced to Fresno Section, the Authority will monitor service levels in the vicinity of the Merced and Fresno stations and, at such time as an HMF site is selected, at the HMF site, in order to establish baseline service demands. "Service levels" consist of the monthly volume of calls for fire and police protection, as well as city- or fire protection district-funded emergency medical technician/ambulance calls that occur within the station and HMF site service areas. Prior to operation of the stations for HST service, the Authority will enter into an agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services above the average baseline service demand level for the station and HMF service areas (as established during the monitoring period). The fair share will be based on projected passenger use for the first year of operations, with a growth factor for the first 5 years of operation. This cost-sharing agreement will include provisions for ongoing monitoring and future negotiated amendments as the stations are expanded or passenger use increases. Such amendments will be made on a regular basis for the first 5 years of station operation, as will be provided in the agreement. To make sure that services are made available, impact fees will not constitute the sole funding mechanism, although impact fees may be used to fund capital improvements or fixtures (for example, police substation, additional fire vehicles, onsite defibrillators) necessary to service delivery.

After the first 5 years of operation, the Authority will enter into a new or revised agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services. The fair share will take into account the volume of ridership, past record and trends in service demand at the stations and HMF site, new local revenues derived from station area development, and any services that the Authority may be providing at the station.

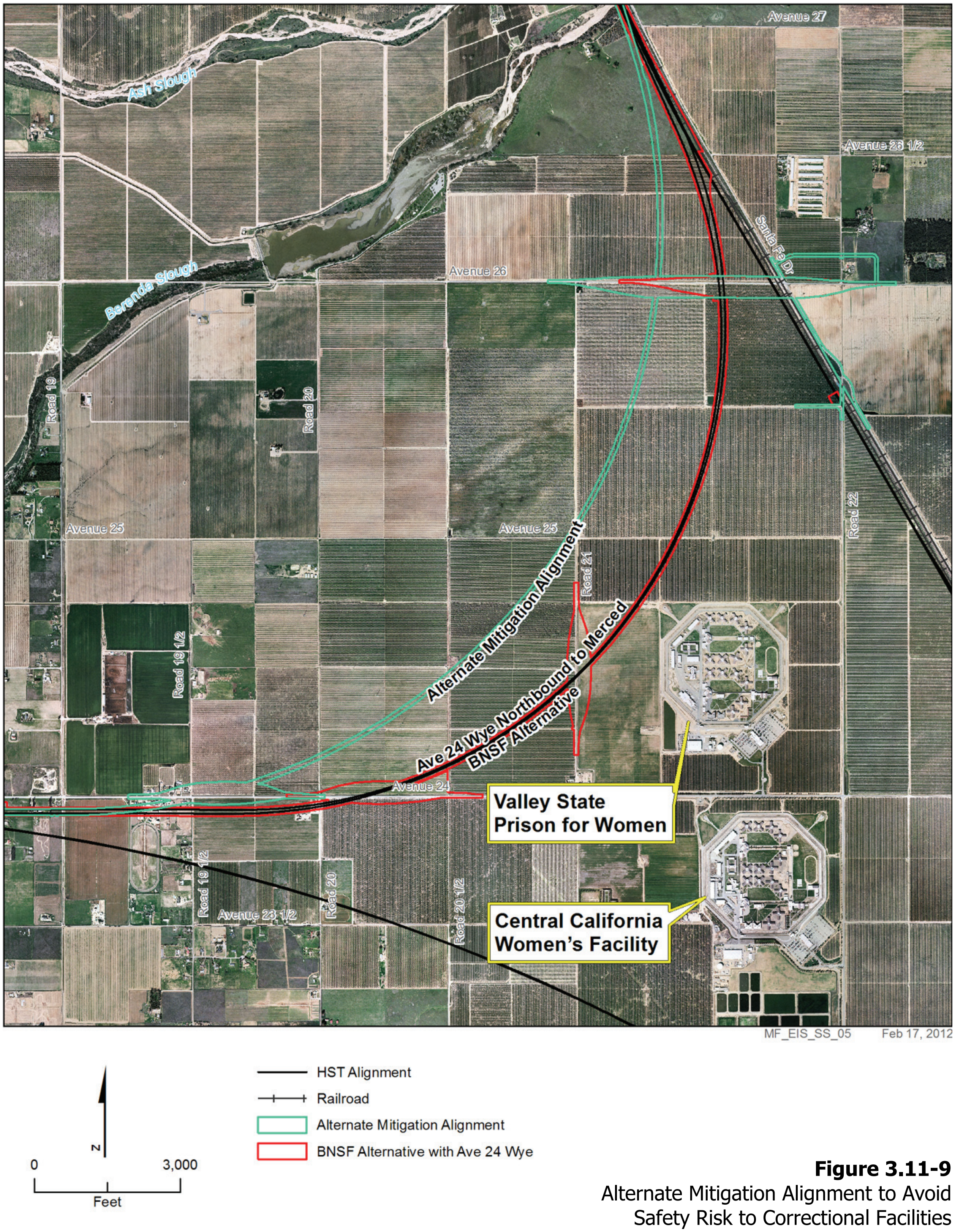


Figure 3.11-9
Alternate Mitigation Alignment to Avoid
Safety Risk to Correctional Facilities

The mitigation measures in for safety and security would avoid the potential for safety or security risks at correctional facilities through changes in project design and would maintain acceptable service ratios and response times for fire, rescue, and emergency services by providing fair share funding if needed.

3.11.8 NEPA Impacts Summary

Under the No Project Alternative, existing safety conditions related to motor vehicles, pedestrians, and bicyclists would not change and existing emergency response plans and procedures would not be affected.

Under the HST alternatives, direct and indirect effects have been identified under NEPA for the construction period as well as the operation of the proposed project. These effects are summarized below.

- Construction would result in effects with negligible intensity resulting from accident risk at construction sites with implementation of a standard CSHP; detours around construction sites on the number of accidents and emergency response times with implementation of the construction transportation plan and traffic control plan; and potential breach in security at state prisons because of the distance between the construction operations and the prisons. The majority of these effects are typical of transportation infrastructure projects, are local in scale, and affect only construction workers who are trained in safety and security measures; therefore they would not be considered significant under NEPA.

- An effect with negligible intensity from train-to-train collisions, collisions with vehicles or other trains entering the HST corridor, or train derailments with implementation of design standards. HST operations worldwide share the safest travel record of any mode of transportation, as supported in this section. With a commitment to the highest design standards, the potential of an accident with the HST would not be significant under NEPA.

- The HST alignment would have no effect on motor vehicle, pedestrian, and bicycle safety due to full grade separation and roadway improvements. Because the project involves replacement of at-grade crossings over existing railroad lines, the change of safety for the local communities would have a beneficial effect under NEPA.

- An effect with negligible intensity from seismic and fire risks with implementation of design features and standard operating and emergency response plans would not be significant under NEPA.

- An effect with negligible intensity on increased response times for emergency responders and their access to elevated tracks with implementation of standard design features and operating and emergency response plans. Considering the available emergency service equipment and staff in the region, response times, and safety record of the HST, this would not be significant under NEPA.

- A potential effect with moderate intensity on demand for local emergency responses in station areas and at the HMF. The number of people who may be present at a station may result in a concentration of additional emergencies in a localized area. Although emergency responses may be more frequent, the facilities and emergency responses can be achieved and therefore this would not result in a new service and would not be significant under NEPA.

- An effect with negligible intensity from criminal and terrorist activity with implementation of standard design features and operating plans. The probability for a criminal or terrorist activity in the project corridor is remote and therefore would not be significant under NEPA.

- An effect with negligible intensity from proximity to private airstrip along the BNSF Alternative with the Ave 21 Wye because the airstrip would be acquired. There are several semi-public and private airstrips in the region, so although this would change the patterns for a few private aircraft it would not reduce the accessibility in the local and regional areas. Therefore this would not be significant under NEPA.

- An effect with negligible intensity from nearby industrial facilities because of building codes and safety regulations.
- An effect with substantial intensity on the VSPW from the BNSF Alternative with the Ave 24 Wye resulting from proximity of an overpass to the secure perimeter. This impact would have substantial intensity because of the potential for security problems and disturbance to the facility. This effect would be significant under NEPA because the roadway would be permanent in duration and could result in a permanent security threat. To mitigate this effect, the alignment will be revised to avoid CDCR property, which would result in no impacts on the VSPW. The potential effects on security at the CCWF from the BNSF Alternative or the Hybrid Alternative would have negligible intensity and no new measures or staff would be required at the CCWF and therefore would not be significant under NEPA.
- An effect with negligible intensity on schools with implementation of standard design features would not be significant under NEPA.
- An effect with negligible intensity from dam failures because of the existing dam safety program would not be significant under NEPA.

Residual effects of the project on safety and security following mitigation would have negligible intensity. No significant impacts would remain after mitigation. The Authority will compensate fire, rescue, and emergency service providers for increased services required because of the project.

3.11.9 CEQA Significance Conclusions

Table 3.11-7 lists significant safety- and security-related impacts, associated mitigation measures, and the level of significance after mitigation. After mitigation, no impacts related to safety and security would be significant under CEQA.

Table 3.11-7
Summary of Significant Safety and Security Impacts and Mitigation Measures

Impact	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Project Impacts			
S&S #1: Ave 24 Wye north-bound leg connecting to the BNSF Alternative (Road 21 overpass) presents security risk to correctional facilities.	Significant	**S&S-MM#1**: Revise design to avoid safety risk to correctional facilities from roadway overpass.	Less than significant
S&S #2: Increased demand for fire, rescue, and emergency services at stations and HMF.	Significant	**S&S-MM#2:** Monitor response of local fire, rescue, and emergency service providers to incidents at stations and the HMF and provide a fair share cost of service.	Less than significant