3.11 Safety and Security

3.11.1 Introduction

As described in the 2005 Statewide HST Program EIR/EIS (Authority and FRA 2005) and the 2010 Final Bay Area to Central Valley HST Program EIR/EIS (Authority and FRA August 2010), safe operation of the HST is of utmost importance. 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 (e.g., mainline tracks and maintenance and storage facilities) would be designed to prevent access by unauthorized vehicles, people, animals, and objects. 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.

Overall safety and reliability of the California HST system would be achieved by 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 aspects of the California HST System.

This section of the Fresno to Bakersfield 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.

The automobile is by far the most used and dangerous transportation mode when comparing automobile, 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 2008a, 2008b). 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 2010). The potential for automobile 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.

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 HST trains (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 2011). 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 (National Aeronautics and Space Administration 2007 and North East Wales Institute of Higher Education 2004). German ICE trains carry more than 66 million passengers a year.

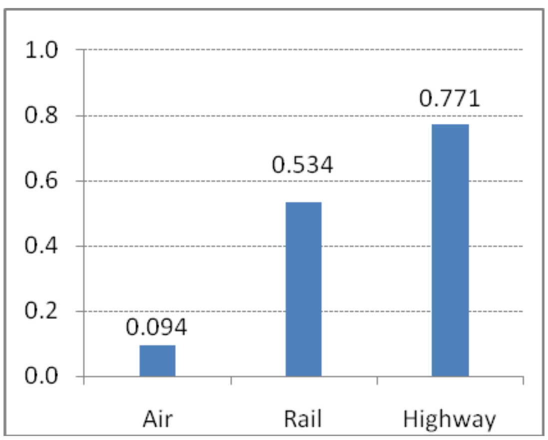


Figure 3.11-1
Fatalities (per 100 million passenger miles in 2008)

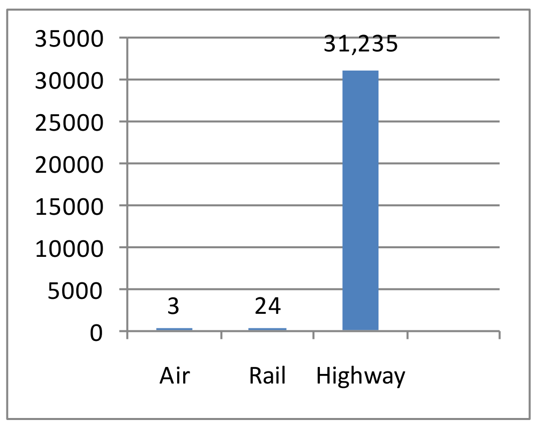


Figure 3.11-2
Total Passenger Fatalities in 2008

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 fatalities per 100 million miles traveled.

Source: FRA 2010a.

In addition to the safe operation of 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 Regulatory Requirements

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

A. FEDERAL

The Federal Railroad Administration (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 the 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 is 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 trains, whereas PTC shifts the safety emphasis to crash-avoidance.

Federal Railroad Administration (49 CFR Volume 4, Chapter 2, Part 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 of the act 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 Directive RAILPAX-04-01 and RAILPAX-04-02 require rail transportation operators to implement certain protective measures, report 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.

B. STATE

California Public Utilities Code (Sections 7710 to 7727)

The California Public Utilities Code Sections 1201 to 1220 cover railroad crossings of roads. The Public Utilities Commission must approve plans for all railroad crossings, construction work at railroad crossings, and grade separations.

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.

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 *Airport Land Use Planning Handbook* (Caltrans 2002) be used as a technical resource to assist in the preparation of an EIR for any project situated within the boundaries of an airport land use compatibility plan. The *Airport Land Use Planning Handbook* supports the State Aeronautics Act (California Public Utilities Code, Section 21670 et seq.), 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.

C. 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, as those items relate to identified fire and geologic hazards. The general plans for Fresno, Kings, Tulare, and Kern 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 police and fire department master plans. Table 3.11-1 lists safety and security plans by jurisdiction. Section 3.10, Hazardous Materials and Wastes, outlines hazardous waste response plans.

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, Affected Environment, which also contains information on emergency medical services. The following local plans and policies were identified and considered in the preparation of this analysis.

Table 3.11-1
General Plans and Other Plans Considered

Jurisdiction	Safety Plan
Fresno County	• Fresno County General Plan (2000a) • Fresno County Municipal Code, Chapter 2.44: Emergency Organization • Fresno County Operational Area Master Emergency Services Plan (1998)
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
Kings County	• 2035 Kings County General Plan (adopted 1993, as amended) • Kings County Multi-Jurisdictional Multi-Hazard Mitigation Plan (2007) • Kings County Municipal Code, Chapter 6.8: Emergency Organization
City of Hanford	• Hanford General Plan (2002) • Hanford Municipal Code, Chapter 2.44.090: Emergency Organization
City of Corcoran	• 2025 Corcoran General Plan (2007) • Corcoran Municipal Code, Chapter 4, Section 2-4-9: Emergency Organization
Tulare County	• Tulare County General Plan (2008) • Tulare County Code, Chapter 15: Civil Defense and Disaster
Kern County	• Kern County General Plan (2007) • Kern County Emergency Operations Plan (2008) • Kern County Municipal Code, Chapter 2.66.050: Emergency Organization
City of Wasco	• Wasco General Plan (2002) • Wasco Municipal Code, Chapter 2.32: Emergency Organization
City of Bakersfield	• Metropolitan Bakersfield General Plan (2009) • Bakersfield Municipal Code, Chapter 2.40.070: Emergency Organization—Constitution

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. These airport plans were also considered in the preparation of this analysis.

Table 3.11-2
Airport Plans Considered

Jurisdiction	Safety Plan
Fresno County	• Land Use Compatibility Plan (Fresno County Airport Land Use Commission 2010) • Fresno-Chandler Downtown Airport Master and Environs Specific Plan (1999)
Kings County	• Land Use Compatibility Plan (Kings County Airport Land Use Commission 1994) • Hanford Municipal Airport Master Plan (2010)
Kern County	• Land Use Compatibility Plan (Kern County Airport Land Use Commission 2008) • Meadows Field Airport Master Plan (2006)

D. OTHER REQUIREMENTS

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

3.11.3 Methods of Evaluation of 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 existing 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 the following:

- Train travel.
- Vehicle, bicycle, and pedestrian access at stations.
- 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.

A. 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 consideration of context. Beneficial effects are identified and described. When there is no measurable effect, impact is found not to occur. Intensity of adverse effects are summarized as the degree or magnitude of a potential adverse effect where the adverse effect is thus determined to be negligible, moderate, or substantial. It is possible that a significant adverse effect may still exist when on balance the impact is negligible or even beneficial.

Negligible effects on public safety are defined as impacts that would not increase emergency response times or risk of accidents beyond existing conditions. *Moderate* effects 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. *Substantial* effects on public safety are defined as impacts that would increase emergency response times or risk of accidents on a regional scale.

Negligible effects on security are defined as effects that would not increase the risk of criminal or terrorist acts beyond existing conditions. *Moderate* effects on security are defined as effects that would increase the risk of criminal or terrorist acts in localized areas but that would not have wide-ranging effects. *Substantial* effects on security are defined as effects that would increase the risk of criminal or terrorist acts on a regional scale.

B. CEQA SIGNIFICANCE CRITERIA

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 (e.g., sharp curves or dangerous intersections) or incompatible uses.
- Result in a safety hazard for people residing or working in the project vicinity (for a project 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.

C. STUDY AREA

For the evaluation of direct safety and security effects, the Fresno to Bakersfield 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 Fresno, Kings/Tulare Regional, and Bakersfield HST stations. The indirect effects study area is made up of the cities and counties between Fresno and Bakersfield. Since 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 (e.g., fire departments, police departments, 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 project footprint.

3.11.4 Affected Environment

This section discusses the affected environment related to safety and security in the study area. There are no applicable regional plans or policies pertaining to safety and security within the Fresno to Bakersfield Section study area.

A. EMERGENCY SERVICES

Fire

Table 3.11-3 summarizes the fire departments and the types of equipment operated within the Fresno to Bakersfield Section. Fire stations in the vicinity of HST alternatives are shown on Figures 3.11-3 through 3.11-7. All of the fire departments consist of paid employees, and the Kings County, Tulare County, and Kern County fire departments also have volunteers. The City of Corcoran contracts fire protection through the Kings County Fire Department. The cities of Wasco and Shafter contract fire protection through the Kern County 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. None of the fire departments have specialized heavy rescue equipment.

Table 3.11-3
Fire Departments and Equipment in the Fresno to Bakersfield HST Study Area

Fire Department	Service Area	Equipment
City of Fresno	City of Fresno	7 ladder trucks—at least 85 feet tall Hazmat truck Hazmat decontamination trailer 2 brush rigs for vegetation fires Rescue truck
Fresno County Fire Department	Unincorporated Fresno County and cities of Joaquin, Parlier, Mendota, and Huron	Ladder at least 85 feet tall 18 engines Rescue truck Hazmat truck Containment trailer
Hanford Fire Department	City of Hanford	Ladder truck 50 feet tall Hazmat truck Containment trailer
Kings County Fire Department	Unincorporated Kings County and cities of Avenal and Corcoran	Ladder truck at least 85 feet tall 26 engines Water tanker Helipad at Station #4

Table 3.11-3
Fire Departments and Equipment in the Fresno to Bakersfield HST Study Area

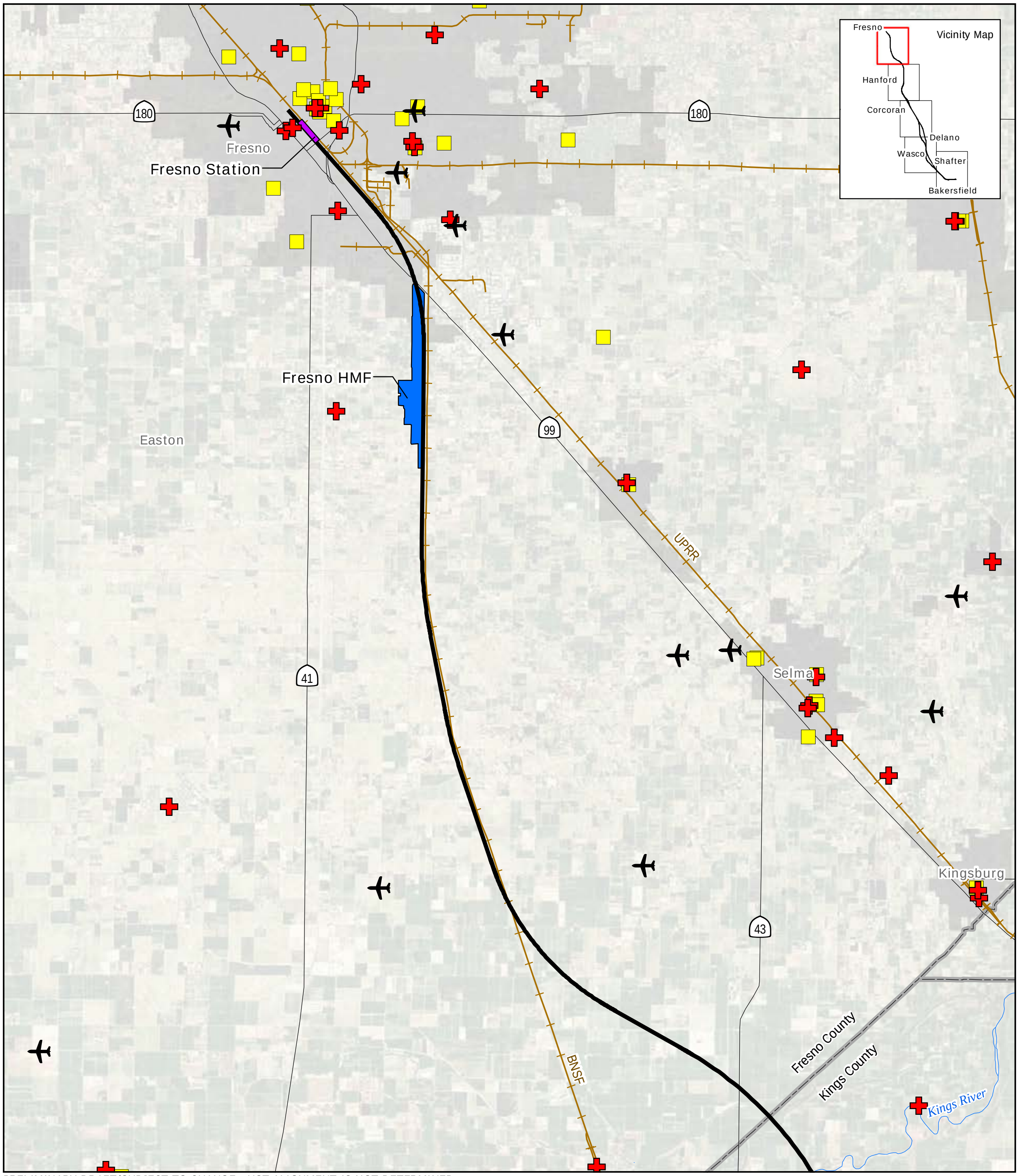
Fire Department	Service Area	Equipment
Tulare County Fire Department	Unincorporated Tulare County	2 ladder trucks at least 85 feet tall 33 engines Rescue truck 6 water tankers
Kern County Fire Department	Unincorporated Kern County and cities of Arvin, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi, and Wasco	3 ladder trucks 51 engines Hazmat truck 3 crash rescue vehicles Air van
Bakersfield Fire Department	City of Bakersfield	3 ladder trucks—100 feet tall 13 engines 4 type II engines for vegetation fires Light/air truck Hazmat truck USAR truck Technical rescue trailer Emergency medical service trailer Decontamination trailer

Sources: City of Fresno Fire Department 2010; Venegas 2010, personal communication; Sumaya 2010, personal communication; Sunderland 2010, personal communication; Kern County Fire Department 2010; Bakersfield Fire Department n.d.;

Response times for fire departments vary in the study area. The cities of Fresno, Hanford, and Corcoran have a goal of responding to calls within 5 minutes of receiving an alert 90% of the time or more. The Tulare County Fire Department goal is to respond to urban calls in 9 minutes 90% of the time and suburban calls in 10 minutes 80% of the time. The Kern County Fire Department goal is to respond to calls in Wasco and Shafter within 15 minutes. The City of Bakersfield has a call response goal of 7 minutes 90% of the time or more. Response goals in the rural areas of Fresno, Kings, Tulare, and Kern counties are approximately 15 minutes. Response times depend on how close the nearest stations are, and whether firefighters are responding to other emergencies (Fresno County 2000b; Kings County n.d.; Tulare County Fire Department 2008; Kern County 2009; City of Fresno Fire Department n.d.; Hanford Chamber of Commerce 2009; Bakersfield Fire Department n.d.).

At-grade railroad crossings hinder emergency response times when trains block the crossings. In such instances, emergency response teams must use 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.

The California Department of Forestry and Fire Protection (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 [1996] 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 2007). The project region is not in any of the Fire Hazard Severity Zones, and the area crossed by the project alternatives is not considered to pose a significant risk for wildland fires.



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

March 22, 2011

Data source: USGS Geographic Names Information System, 2009

Base map source: USGS National Elevation Dataset, 90-m hillshade

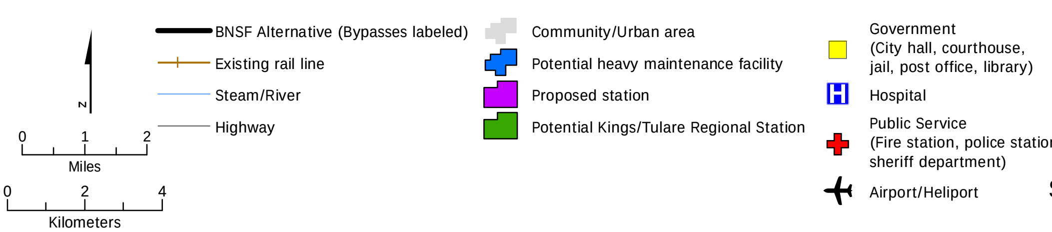
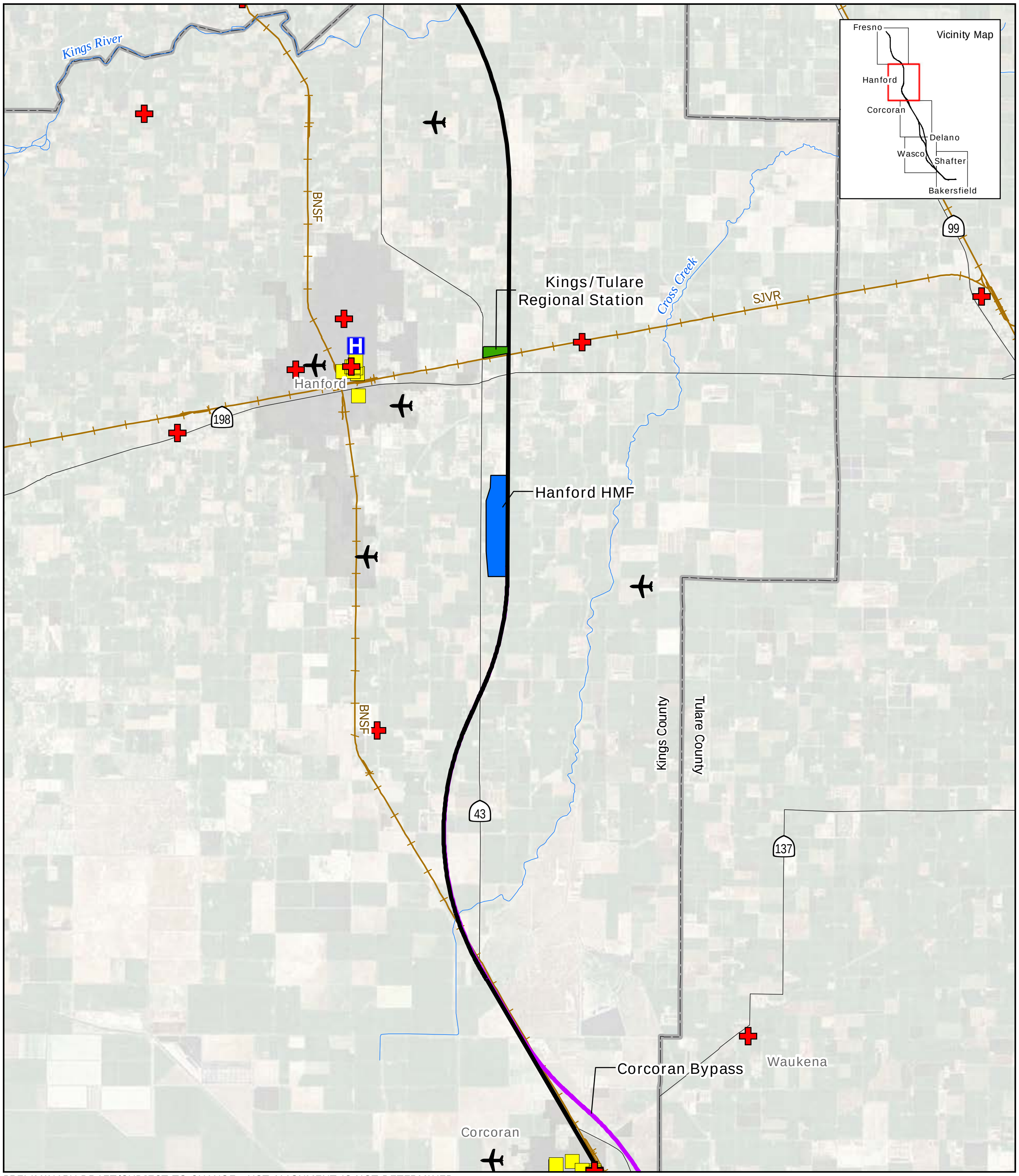


Figure 3.11-3
Fresno area:
Safety and security
existing conditions



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

March 22, 2011

Data source: USGS Geographic Names Information System, 2009

Base map source: USGS National Elevation Dataset, 90-m hillshade

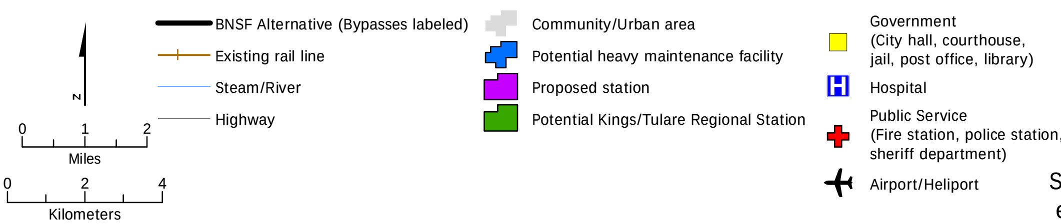
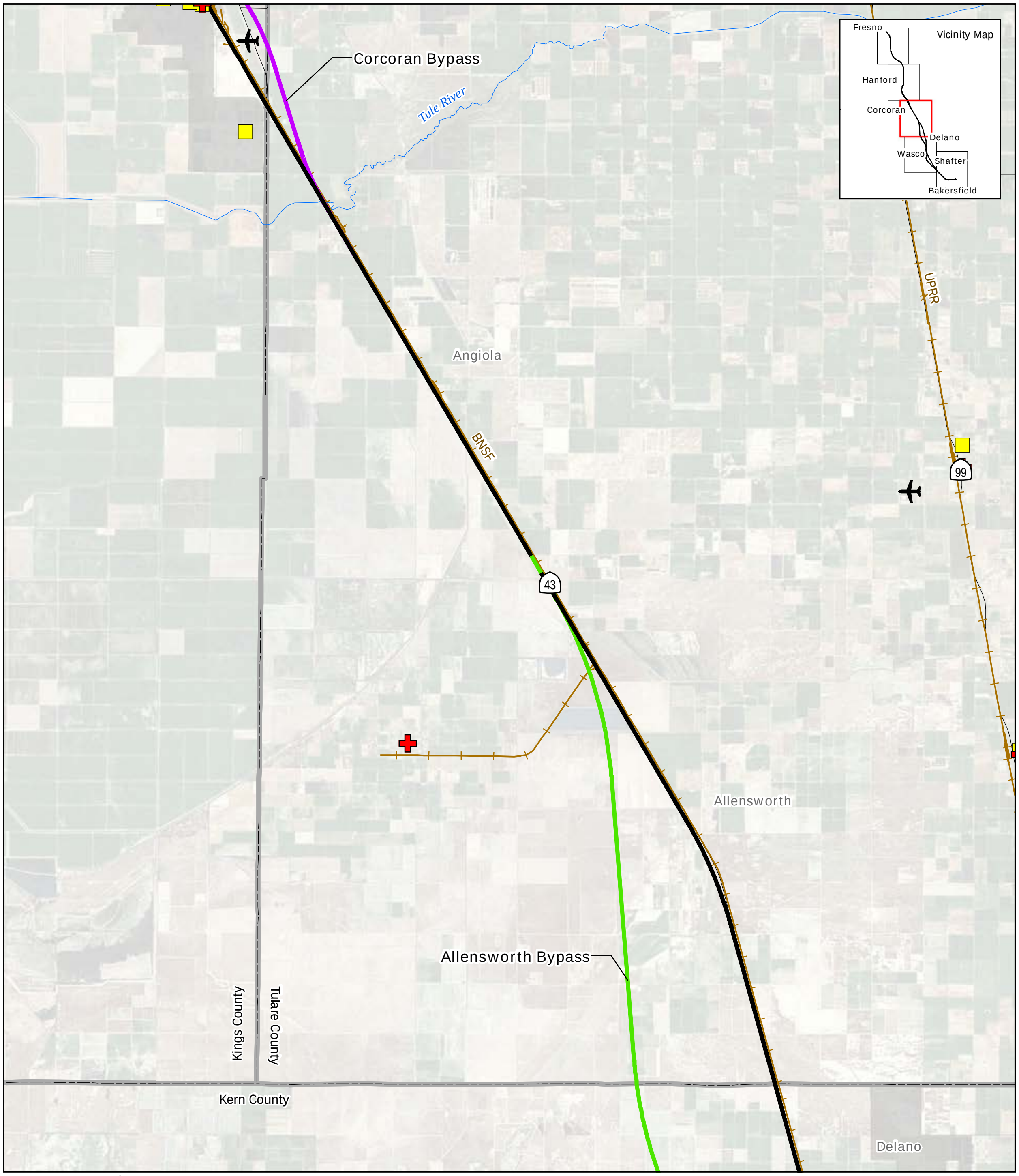


Figure 3.11-4
Hanford area:
Safety and security
existing conditions



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
March 22, 2011
Data source: USGS Geographic Names Information System, 2009
Base map source: USGS National Elevation Dataset, 90-m hillshade

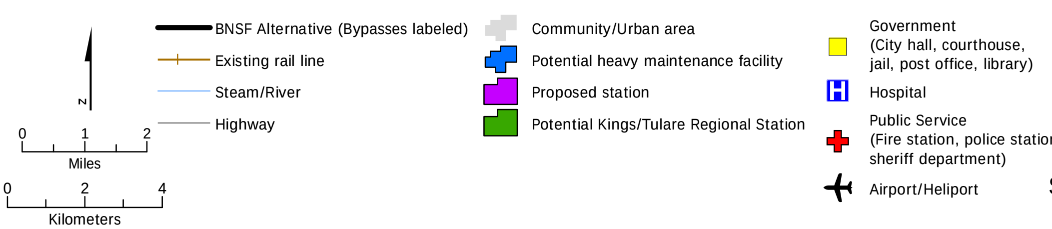
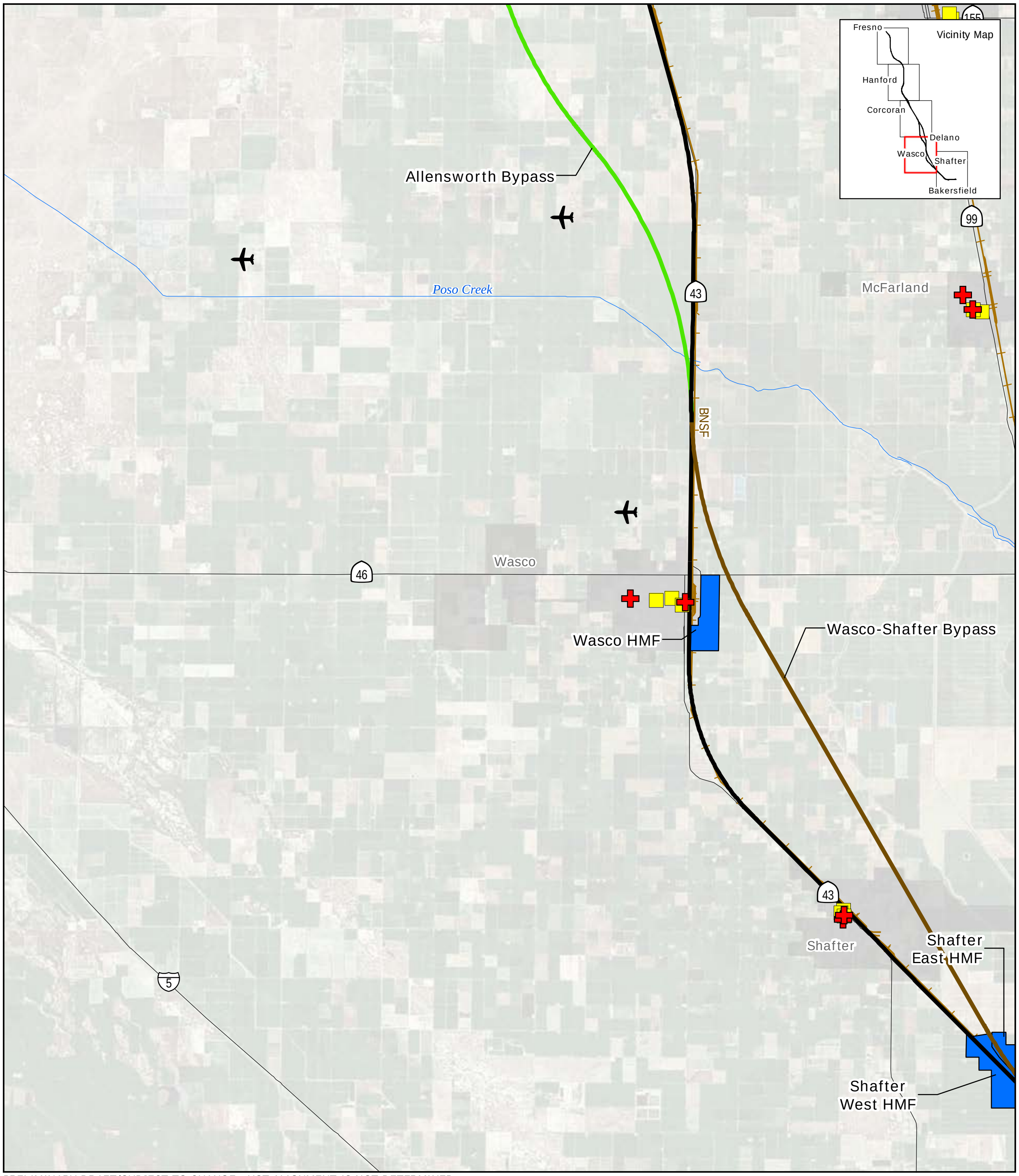


Figure 3.11-5
Corcoran area:
Safety and security
existing conditions



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

March 22, 2011

Data source: USGS Geographic Names Information System, 2009

Base map source: USGS National Elevation Dataset, 90-m hillshade

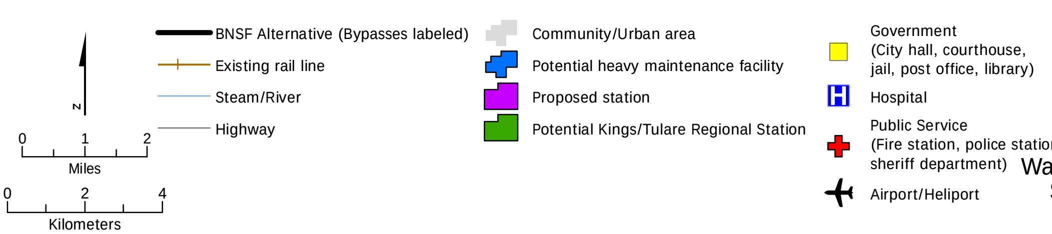
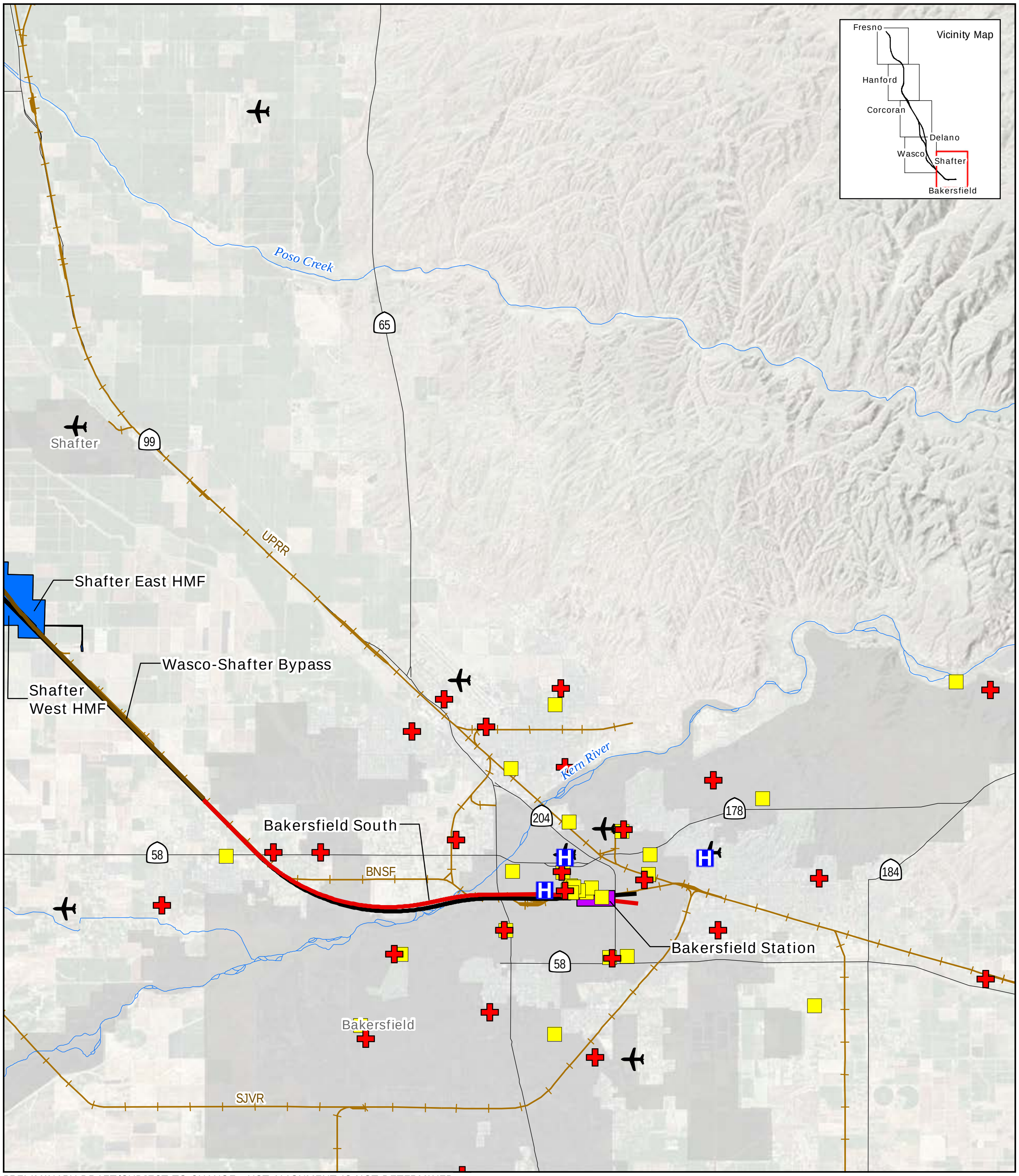


Figure 3.11-6
Wasco - Shafter area: Safety and security existing conditions



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

March 22, 2011

Data source: USGS Geographic Names Information System, 2009

Base map source: USGS National Elevation Dataset, 90-m hillshade

N

0 1 2
Miles

0 2 4
Kilometers

- BNSF Alternative (Bypasses labeled)
- Existing rail line
- Steam/River
- Highway
- Community/Urban area
- Potential heavy maintenance facility
- Proposed station
- Potential Kings/Tulare Regional Station
- Government (City hall, courthouse, jail, post office, library)
- Hospital
- Public Service (Fire station, police station, sheriff department)
- Airport/Heliport

Figure 3.11-7
Bakersfield area:
Safety and security
existing conditions

Law Enforcement

Response times to calls for law enforcement vary in the project area. City of Fresno police officers respond to the most urgent calls in about 6.5 minutes on average (Brogdon 2010, personal communication). City of Bakersfield police officers respond to the most urgent calls in about 9 minutes on average (Stein 2010, personal communication).

Crime rates in Fresno and Bakersfield, where the stations would be located, were compared to crime rates in the state. The violent crime rate in Fresno is higher than the state average (14 crimes per 1,000 inhabitants in Fresno versus 5 crimes per 1,000 inhabitants in California as a whole), while the violent crime rate in Bakersfield is only slightly higher than the state average (5.7 crimes per 1,000 inhabitants). Property crime in Fresno and Bakersfield (35 and 40 crimes per 1,000 inhabitants, respectively) is higher than the state average (29 crimes per 1,000 inhabitants) (Federal Bureau of Investigation 2008).

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

Emergency medical services are provided by the local fire departments, emergency medical service agencies, and independent ambulance services. Five hospitals provide medical service to the study area, one of which is a Level I trauma center (Fresno Community Regional Medical Center). Three air ambulance services operate in the study area: out of the Fresno Community Regional Medical Center, the San Joaquin Community Hospital, and the Kern Medical Center.

Emergency Response Plans

In addition to emergency operations requirements set forth in the county and city general plans, all the 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 3.11-7 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. Thirteen regionally significant roads cross the BNSF Railway (BNSF) tracks at grade along the alternative alignments, resulting in the potential for delays to emergency response and evacuation if trains block these roads.

Emergency Services for Heavy Maintenance Facility Alternatives

Safety conditions at the proposed HMF sites are similar for the project alignment 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.

Table 3.11-4
Fire, Law Enforcement, and Emergency Medical Services Locations
by Heavy Maintenance Facility Site

Heavy Maintenance Facility Site	Closest Fire Station	Closest Police/Sheriff Office	Closest Hospital
Fresno Works–Fresno	1.25 miles, Fresno Fire Department, Battalion 17 Station 87, Fresno	1.75 miles, Fresno Police Department, Southeast Policing District, Fresno	2.2 miles, Valley Medical Center, Fresno
Kings County–Hanford	0.1 mile, Kings County Fire Department, South Hanford Station, Hanford	3.1 miles, Hanford Police Department, Hanford	3.0 miles, Central Valley General Hospital, Hanford
Kern Council of Governments–Wasco	1.2 miles, Kern County Fire Department, Wasco Station 31, Wasco	0.1 mile, Kern County Sheriffs Department, Wasco Substation, Wasco	6.1 miles, Delano Regional Medical Center, Delano
Kern Council of Governments–Shafter West and Shafter East	0.1 mile, Kern County Fire Department, Wasco Station 32, Shafter	0.1 mile, Shafter Police Department, Shafter	1.4 miles, Mercy Southwest Hospital, Bakersfield

B. COMMUNITY SAFETY

Vehicular Safety

As described earlier, the automobile is the most used and hazardous transportation mode. In 2008, the California Highway Patrol reported there was over 3,400 fatalities and approximately 242,000 nonfatal injuries on California's highways (California Highway Patrol 2008a, 2008b). 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 (e.g., wind, rain, fog, darkness, and sun glare), and driver distractions and interferences.

Vehicular safety issues associated with the three 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 (Operation Life Saver, Inc. 2009). There were a total of 25 highway-rail grade crossing collisions in Fresno, Kings, Tulare, and Kern counties in 2009. These collisions resulted in four fatalities (FRA 2010b).

Additional details on existing vehicular traffic conditions, including congestion and accident patterns, within the station areas for the Fresno to Bakersfield HST Section are included in Section 3.2, Transportation, and in the *Fresno to Bakersfield Section Transportation Technical Report* (Authority and FRA 2011).

Rail and Airports

The study area includes the BNSF, Union Pacific Railroad (UPRR), and San Joaquin Valley Railroad (SJVR) railways. Within the study area, Amtrak provides passenger service on its *San Joaquin* trains that operate on the BNSF Railway tracks from Fresno to Bakersfield with stops in Hanford, Corcoran, and Wasco. The BNSF Railway, UPRR, and SJVR operate only freight trains.

Except for a few grade separations in Fresno and Bakersfield, all road crossings of the BNSF Railway, UPRR, and SJVR are at-grade. There are 104 at-grade crossings of the BNSF tracks and 76 at-grade crossings of the UPRR tracks in the project study area. The BNSF tracks are adjacent to State Route (SR) 43 from north of Corcoran to SR 58 near Bakersfield in the study area. Neither the highway nor BNSF rights-of-way is fenced in this region, and there are no barriers between the highway and the railway. In many places, the BNSF tracks are on embankments up to about 8 feet above SR 43. Stormwater drainage ditches also provide a topographic separation between rail operations and vehicular traffic.

The FRA defines a train accident as a safety-related event involving on-track equipment, whether standing or moving (FRA 2005). 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, 208 train accidents, including Amtrak accidents, occurred in Fresno, Kings, Tulare, and Kern counties on the UPRR and BNSF tracks between January 2007 and September 2009, including 8 accidents that resulted in 8 fatalities and 18 that resulted in 71 injuries. These accidents comprise all train accidents in the four counties, including accidents outside of the study area. Most accidents (approximately 70%) were associated with derailments, and approximately 17% of the accidents were highway/rail impacts (FRA 2010b). Faulty tracks, human error, and highway-railroad crossings were the primary cause of these accidents. The following accidents occurred in the study area (FRA 2010b):

- Along the BNSF tracks, 29 accidents occurred on at-grade highway/railroad crossings between January 2004 and October 2009. Three incidents were pedestrian accidents in Fresno, one of which was a fatality. There were 15 vehicle collisions on at-grade highway crossings of the BNSF tracks in the study area that resulted in 17 injuries and 6 fatalities.
- A total of 23 accidents occurred on at-grade highway/railroad crossings along the UPRR tracks between January 2004 and October 2009. Five incidents were pedestrian accidents in Fresno and Kings County at 11th Avenue. There were 6 vehicle collisions on at-grade highway crossings of the UPRR tracks in the study area that resulted in 7 injuries and 1 fatality.
- Along the SJVR tracks, 15 accidents occurred on at-grade highway/railroad crossings between January 2004 and October 2009. There were 5 vehicle collisions on at-grade highway crossings of the SJVR in the study area that resulted in 6 injuries.
- Amtrak trains, which use the BNSF tracks in the study area, were involved in 26 accidents on at-grade highway/railroad crossings between January 2004 and October 2009. Two incidents were pedestrian accidents at Divisadero Avenue in Fresno and Armona Road in Kings County, one of which was a fatality. There were 15 vehicle collisions on at-grade highway crossings of Amtrak in the study area that resulted in 55 injuries and 7 fatalities. An accident at a crossing on Kansas Avenue in Kings County in 2008 accounted for 32 of these injuries, and another accident at a crossing on Los Angeles Avenue in 2007 accounted for 10 injuries.

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

There are four public-service airports, three private airports, and four heliports within 2 miles of project alternatives (Table 3.11-5; Figures 3.11-3 through 3.11-7). 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. None of the project alternatives encroach on areas covered by airport land use compatibility plans (City of Fresno Planning Department 2009, Kings County Airport Land Use Commission 1994, Kern County Planning Department 2008).

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

Facility	Distance from Centerline (miles)	County	Alternative Alignment
Fresno-Chandler Downtown Airport	0.80	Fresno	BNSF Alternative
Valley Medical Center Heliport	1.83	Fresno	BNSF Alternative
PG&E-Fresno Service Center Heliport	0.79	Fresno	BNSF Alternative
Turner Field (private airport)	1.61	Fresno	BNSF Alternative
Swanson Ranch Number 1 Airport (private airport)	1.36	Kings	BNSF Alternative
Hanford Municipal Airport	1.81	Kings	BNSF Alternative
Kings County Fire Department South Hanford Station #4	0.16	Kings	BNSF Alternative
Corcoran Airport	1.83 2.63	Kings	BNSF Alternative Corcoran Bypass Alternative
Salyer Farms Airport (private airport)	0.56 0.18	Kings	BNSF Alternative Corcoran Bypass Alternative
Wasco Airport	0.98 1.33	Kern	BNSF Alternative Wasco-Shafter Bypass Alternative
San Joaquin Community Hospital Heliport	0.88	Kern	BNSF Alternative, Bakersfield South Alternative
Kern Medical Center Heliport	0.90	Kern	BNSF Alternative, Bakersfield South Alternative

Note:
Distance is given in approximate miles from the centerline of each alternative.
Source: U.S. Geological Survey 2009.

Pedestrian and Bicycle Safety

According to the 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, 10 at-grade crossing accidents occurred within the study area. Two resulted in pedestrian fatalities in Fresno and Kings County, and seven resulted in seven pedestrian injuries in downtown Fresno, rural Kings County, and rural Kern County (FRA 2010b). Appendix 3.11-A, Safety and Security Data, provides information on the at-grade crossing accidents.

With regard to cyclist safety, 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. Pedestrian and cyclist safety issues associated with the BNSF, UPRR, and SJVR tracks in the study region primarily result from the conflict between pedestrians and cyclists and trains on at-grade crossings. Some 70 at-grade crossings occur in the study area. In the cities of Fresno, Corcoran, Wasco, Shafter, and Bakersfield, intersections near the at-grade crossing are generally signalized or stop-controlled. Many of these intersections have marked crosswalks for safe pedestrian movement. Generally, sidewalks are available on both sides or on one side of the street and meet the standards for the Americans with Disabilities Act (ADA). At-grade crossings of roads and highways outside these urban areas are often not stop-controlled and do not have marked crosswalks for safe pedestrian or bicycle movement. There are no Class I (paved bikeways physically separated from the roadway) or Class II (lanes for cyclists adjacent to the outside travel lane of the roadway, with special lane markings, pavement legends, and signs) bikeway facilities near the at-grade crossings. Class III (signed for bike use but with no separate or exclusive right-of-way or lane striping on the roadway) bikeway facilities are on or are proposed for several streets with at-grade crossings in Fresno, Wasco, Shafter, and Bakersfield. Tulare County is planning to establish a bike path along Sierra Avenue that would cross the BNSF tracks in the Allensworth area.

Schools

Table 3.11-6 lists the schools within 0.25 mile of the alternatives for the Fresno to Bakersfield Section. Several schools in Bakersfield are close to the alternative alignments. The BNSF Alternative would acquire the Industrial Arts building on the Bakersfield High School campus. The Bakersfield South Alternative is approximately 300 feet north of Bakersfield High School and is separated from the high school by the BNSF rail yard. Our Lady of Guadalupe School is almost 0.25 mile from the BNSF Alternative in Bakersfield but only about 420 feet from the Bakersfield South Alternative. Homes and light industry separate the Bakersfield South Alternative from Our Lady of Guadalupe School. Franklin Elementary School is approximately 600 feet north of the Bakersfield South Alternative. The school is separated from the HST alternatives by a residential block.

Table 3.11-6
Schools Within 0.25 Mile of Alignment Alternative Centerlines

Facility	Distance from Centerline (miles)	City	Alternative Alignment
Pacific Union Elementary School	0.18	Fresno	BNSF Alternative
Riverdale School	0.21	Corcoran	BNSF Alternative
Richland Senior Elementary School	0.22	Shafter	BNSF Alternative
Bakersfield High School	0 0.07	Bakersfield	BNSF Alternative Bakersfield South Alternative
Franklin Elementary School	0.20 0.11	Bakersfield	BNSF Alternative Bakersfield South Alternative
Our Lady of Guadalupe School	0.25 0.08	Bakersfield	BNSF Alternative Bakersfield South Alternative
Vista East Continuation School	0.14 0.15	Kings	BNSF Alternative Bakersfield South Alternative

Note:
Distance is given in approximate miles from the centerline of each alternative.
Source:
U.S. Geological Survey 2009.

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 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 BNSF Alternative Alignment:

- Modern Custom Fabrication (2421 California Avenue, Fresno, CA): Bulk propane and fuel tanks.
- Western Manufacturing (Corner of Railroad Avenue and South E Street, Fresno, CA): Bulk propane storage.
- Jack Frost Ice (2003 S. Cherry, Fresno, CA): Bulk chemical tanks.
- CAHFS (2797 S. Orange Avenue, Fresno, CA): Propane recycling with burn apparatus.
- KBK Oils, Inc. (Corner of Golden State and Cedar Avenue, Fresno, CA): Bulk propane and fuel tanks.
- Pacific Pride Commercial Fueling (Gateway Avenue, Fresno County): Bulk fuel tanks.
- Kinder Morgan Energy (4073 S. Maple Avenue, Fresno County): Petroleum storage tanks.
- Silvan Oil (4073 S. Maple Avenue, Fresno County): Bulk fuel tanks.
- Chevron (4021 S. Maple Avenue, Fresno County): Bulk fuel tanks.
- Valley Pacific Petroleum (4073 S. Maple Avenue and 4149 S. Maple Avenue, Fresno County): Bulk fuel distribution.
- Kinder Morgan Energy (Across from 2109 Malaga Avenue, Fresno County): Bulk fuel storage.
- Fowler Packing (Near Manning Avenue and Chance Avenue, Fresno County): High-pressure gas pipeline.
- Unnamed propane storage facility (Near Bowles Avenue and Chance Avenue, Fresno County).
- VIE-Del Company (11903 S. Chestnut Avenue, Fresno County): Food processing plant, with bulk chemical storage.
- Baker Commodities (7480 Hanford-Armona Road, Hanford, CA): Bulk chemical storage.
- Union 76/Pacific Pride (Near corner of SR 135 and Ottis Avenue, Hanford, CA): Bulk fuel storage.
- Exxon (Corner of SR 46 and SR 43, “F” Street, Wasco, CA): Bulk fuel storage/distribution.
- Unnamed fuel distribution facility (Next to 1524 “G” Street, Wasco): Bulk fuel storage/distribution.
- Unnamed facility (1868 “G” Street, Wasco, CA): Bulk Chlorine storage tank.
- Helena Chemical Company (751 E. Ash Avenue, Shafter, CA): Bulk chemical storage tanks.

- Wilbur-Ellis (925 Gold Avenue, Shafter, CA): Bulk chemical storage tank.
- QDC/Industrial/Chemicals (32535 7th Standard Road, Kern County. S.E. Corner of Nord Avenue and 7th Standard Road): Bulk chemical storage tanks.
- Verdugo Ozone Treatment Facility (Corner of Verdugo Avenue and Glenn Avenue, Bakersfield, CA): Ozone tank.
- Flying J Refinery (Off of Rosedale Highway [SR 58] and Mohawk Street, Bakersfield, CA). Refinery process equipment and petroleum storage.
- Industrial Chemical Storage (West of Road 204 and North of Hayden Street, Bakersfield, CA): Bulk chemical storage.
- GEO Drilling Fluids (1431 Union Avenue, Bakersfield, CA): Bulk chemical storage.

The Bakersfield South Alternative Alignment has the same explosive threats as the BNSF Alternative in Bakersfield. Those threats are Verdugo Ozone Treatment Facility, Flying J Refinery, Industrial Chemical Storage, and GEO Drilling Fluids.

There are no explosive threats along the Corcoran Elevated, Corcoran Bypass, Allensworth Bypass, and Wasco-Shafter Bypass alternative alignments.

The following high-risk facilities that pose explosion threats are in the vicinity of the Fresno Works–Fresno Heavy Maintenance Facility (HMF) site:

- Kinder Morgan Energy (4073 S. Maple Avenue, Fresno County): Petroleum storage tanks.
- Silvan Oil (4073 S. Maple Avenue, Fresno County): Bulk fuel tanks.
- Chevron (4021 S. Maple Avenue, Fresno County): Bulk fuel tanks.
- Valley Pacific Petroleum (4073 S. Maple Avenue and 4149 S. Maple Avenue, Fresno County): Bulk fuel distribution.
- Kinder Morgan Energy (Across from 2109 Malaga Avenue, Fresno County): Bulk fuel refinery storage.

No explosion threats are present in the vicinity of the other alternative HMF sites.

The fire and rescue agencies follow their own standard emergency response protocols for industrial sites when responding to emergencies at high-risk facilities (Hall 2010, personal communication; Maletta 2010, personal communication).

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, distillation columns, and multistory buildings that 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 BNSF Alternative Alignment include the following:

- Jensen & Pilegard (1068 G Street, Fresno, CA): Feed, seed, farm and garden supply; tall grain elevators.
- Warehouse (Corner G Street and Kern Street, Fresno, CA).
- Jack Frost Ice (2003 S. Cherry Street, Fresno County): Multistory building.

- Cell tower (Near California and Cherry Street, Fresno County).
- KBK Oils Inc. (Near Golden State and Cedar Avenue, Fresno County): Silo/elevator.
- SS Seeds (Near Golden State and Cedar Avenue, Fresno County): Water tank, elevators.
- Fambro (3600 South Cedar Avenue, Fresno County): Water tank.
- Calaveras Heidelberg Cement Group (2095 S. Central Avenue, Fresno County): Elevator.
- VIE-Del Company (11903 S. Chestnut Avenue, Fresno County): Food processing plant, with silo/elevator.
- Cextis (Near SR 43, F Street, and 5th Street, Wasco, CA): Chemical storage tank.
- Cell tower (Northeast side of 7th Standard Road and Nord Avenue, Kern County).
- Water tower (Near D Street and 16th Street, Bakersfield, CA).

The Bakersfield South alternative alignment has the same safety hazards from tall structures as the BNSF Alternative in the Bakersfield Metropolitan Area. No tall structures are present in the vicinity of the Corcoran Bypass, Allensworth Bypass, and Wasco-Shafter Bypass alternative alignments.

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.

A. OVERVIEW

Safety and security areas of concern include the potential for accidents to passengers, the public, and property. With the exception of the proximity of a private airstrip to the Corcoran Bypass Alternative, and the proximity of Bakersfield High School to the BNSF Alternative, there would be similar, negligible safety and security effects under NEPA among the six HST alternatives. Project features, plans, and protocols developed as part of the HST project would avoid or mitigate adverse effects. Under CEQA, these impacts would be less than significant.

B. NO PROJECT ALTERNATIVE

The No Project Alternative is based on existing conditions and the funded and programmed transportation improvements and land use projects that are 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. Increased vehicular traffic volumes over the next 25 years would be expected to result in increased traffic accidents. However, planned roadway capacity expansions would improve operations. These programmed roadway projects would incorporate design features that would reduce the potential for automobile and truck accidents. For these reasons, it is expected that existing accident trends in the study area would continue into the future. Counties and cities have the financial mechanisms in place to meet service level goals for emergency responders with the population growth planned for the study area. For these reasons, no adverse or significant impacts to accident prevention or emergency response are anticipated. Crime rates depend, in part, on economic conditions and, therefore, predictions are speculative.

Safety

Existing safety conditions related to motor vehicles, pedestrians, and bicyclists would not change under the No Project Alternative. Emergency responders would continue to experience delays throughout the study area at numerous at-grade crossings of the UPRR, BNSF, and SJVR 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).

Security

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 BNSF, UPRR, and SJVR when trains block crossings. Conditions related to airports, critical facilities, and high-risk facilities in the study area would not change as a result of planned future projects.

C. HIGH-SPEED TRAIN ALTERNATIVES

Construction Period Impacts

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, effects would be negligible under NEPA and impacts would be less than significant under CEQA for all alignment and HMF alternatives.

Detours around Construction Sites

As discussed in Chapter 2, Alternatives, and shown in Appendix 2-A, a few roads would be closed where they cross the HST alignment, but most public roads crossing the HST alignment would be grade separated, typically with a road overcrossing. In rural areas where the alignment is not parallel to the BNSF Railway tracks, a detour would be built around the section of road to be rebuilt, the overcrossing would be constructed, and traffic would be routed back to the overcrossing and the detour would be removed. Where the HST alignment is parallel to the BNSF Railway tracks, 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 only last a few hours when the final connects to the road overcrossing or detour are made and traffic should not be hampered and emergency response times should not increase. Therefore, the resulting effects would be negligible under NEPA and less than significant under CEQA.

In some cases, it would be necessary to build the overcrossing at the same location as the existing road. In those cases, the road would have to be closed and traffic would have to be detoured onto other roads. These closures would typically last 8 to 10 months, and in a worst-case, the road could be closed 18 months. At these sites, lane closures and detours could potentially create a distraction to 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. However, 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 be negligible under NEPA and less than significant under CEQA under all alignment and HMF alternatives.

BNSF Alternative Alignment

Table 3.11-7 lists the roads that would be closed during construction of the BNSF Alternative. 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 be negligible under NEPA and less than significant under CEQA.

Table 3.11-7
Road Detours for BNSF Alternative Construction

Location	Road	Detour Length (miles)
City of Fresno	Stanislaus Street	0.5
	Tuolumne Street	0.5
	Fresno Street	0.6
	Tulare Street	0.4
	Ventura Street	0.6
	East Central Avenue	1.5
Fresno County	East Lincoln Avenue	1.5
	East Adams Avenue	1.5
	East Manning Avenue	1.5
	East Springfield Avenue	1.5
	East Mountain View Avenue	5.5
City of Corcoran	Patterson Avenue	0.5
City of Wasco	Kimberlina Road	2.0
	Poplar Avenue	2.5
City of Shafter	Fresno Avenue	2.5
Kern County	Kratzmeyer Road	4.5
	Reina Road	2.5

Corcoran Elevated Alternative Alignment

The Corcoran Elevated Alternative would not result in road closures during construction. There would be no effects under NEPA and no impacts under CEQA.

Corcoran Bypass Alternative Alignment

The Corcoran Bypass Alternative Alignment would require the closure of Waukena Avenue during construction, resulting in a 7.5 mile temporary detour onto South Peach Avenue. 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 be negligible under NEPA and less than significant under CEQA.

Allensworth Bypass Alternative Alignment

The Allensworth Bypass Alternative Alignment would not result in road closures during construction. There would be no effects under NEPA and no impacts under CEQA.

Wasco-Shafter Bypass Alternative Alignment

The Wasco-Shafter Bypass Alternative Alignment would require the closure of Kratzmeyer Road and Reina Road during construction. 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 be negligible under NEPA and less than significant under CEQA.

Bakersfield South Alternative Alignment

The Bakersfield South Alternative would not result in road closures during construction. There would be no effects under NEPA and no impacts under CEQA.

Heavy Maintenance Facility Alternatives

Construction of a HMF at any alternative site would not result in road closures and therefore would not pose safety risks to motor vehicles, pedestrians, or bicyclists. There would be no effects under NEPA and no impacts under CEQA.

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. Resulting effects would be negligible under NEPA and less than significant under CEQA for all alignment and HMF alternatives.

Project Impacts

Common Safety Impacts

As described in Chapter 1, Project Purpose & Need and Objectives, 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 for travelers in the Central Valley.

While there would be many benefits, HST operation could result in inadvertent impacts on public, passenger, and employee health and safety, such as increased response time by law enforcement, fire, and emergency services personnel. As discussed below 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) that 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 corridor 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*, as both of the lead vehicles, or locomotives, are designed to withstand the impact of a collision (Aldrich 2006). If applied to all trains, this approach ensures that the 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* (Wyre 2011; Rao and Tsai 2007). 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 (i.e., intrusion, derailment, 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.

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 over 25 years of operation in Europe, there have been no reported passenger fatalities resulting from a train-to-train collision on a HST 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 under NEPA and impacts would be less than significant under CEQA.

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 railroads or highways (Authority 2010). The primary safety concern is that a derailed train or errant vehicle would enter the HST corridor and foul the line. Because a portion of the Fresno to Bakersfield Section of the HST system would operate adjacent to either the BNSF Railway or UPRR, there is a risk of a conventional passenger or freight train derailing, entering the HST trackway, and obstructing or impacting 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.

A horizontal separation of approximately 100 feet between the centerlines of adjacent conventional and HST trackways has been determined to be a distance sufficient to require no additional protection (FRA 1994). Where a railroad line is less than 100 feet from a HST track and both are at ground level, additional protection may be required, including the use of earthen berms and swales or a physical barrier. The need and type of protection is subject to the distance between tracks and the risk of a derailment. Historically, train derailments in the U.S. have generally occurred where there is special trackwork, such as turnouts and crossovers, or where a rail network may not have been adequately maintained to the authorized speed.

When a 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 an aerial structure 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 aerial structure, the adjacent facilities would be at least 25 feet from the nearest supporting column face. Where 25 feet of clearance is not available, then 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 effects 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 (FRA 1993). Strategies to ensure containment include operational 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. Figure 3.11-8 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 3.11-9 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 at 175 miles per hour when the railway earthquake sensors picked up seismic movements. The traction power supply was automatically cut, and the on-board ATP 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. As a result of implementing these standard design practices, the potential for HST derailments would be negligible under NEPA and impacts would be less than significant under CEQA.

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

Motor Vehicle, Pedestrian, and Bicycle Safety

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 (e.g., freight trains) or other vehicles. Therefore, effects to motor vehicle safety would be negligible under NEPA and impacts would be less than significant under CEQA.

Roadway improvements included in the project, such as overpass construction (see Chapter 2 [Alternatives]), would improve vehicular safety through associated street widening, traffic restrictions, and/or new traffic signals. The HST tracks would be grade-separated and the roadways improvements near the stations and along the alignment would comply with design standards for pedestrian and bicycle safety. Therefore, effects to pedestrian and bicycle safety would be beneficial under NEPA and impacts would be less than significant under CEQA.

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. Therefore, effects related to motor vehicles, pedestrians, and bicycles are anticipated to be negligible under NEPA and impacts would be less than significant under CEQA.

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, the resulting potential effects would be negligible under NEPA and impacts would be less than significant under CEQA.

High-speed trains operate in highly seismic areas of Japan and Taiwan. Since HSTs have been built in those countries, substantial efforts have gone into the design and implementation of dynamic rolling stock and structures to prevent catastrophic accidents during seismic events (Kumagai 2008; Cheng et al. 2011). The Taiwan derailment during an earthquake described above is one example of how a severe accident was prevented through structural elements that kept the train upright and within the right-of-way.

In addition to structural design features, the HST system would implement operational procedures to protect passenger and employee health. 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. 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, including 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. 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 result in negligible effects under NEPA and less than significant impacts under CEQA.

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

Road overcrossings along the HST track would also cross over the existing BNSF railroad, resulting in fewer at-grade railroad crossings in the study area. This reduced number of at-grade crossings would result in decreased response times for emergency responders. As discussed in Section 3.2, Transportation, existing roads would either remain unchanged where elevated track would cross them or would be modified into overcrossings where at-grade track would conflict with them. Road segments that would be permanently closed are typically short (less than 1 mile) and access to properties adjacent to these closed roads would be readily available from other roads (see Section 3.2, Transportation). Road crossings in rural areas would occur approximately every 2 miles. Because the project design incorporates roadway modifications to maintain existing traffic patterns and removes many existing at-grade crossings of BNSF tracks, the response times of service provides would be improved. This improvement would be a beneficial effect under NEPA and no impact under CEQA.

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

The HST design would include elevated tracks as high as 45 feet above ground north of Bakersfield and as high as 80 feet above ground level in Bakersfield (see Chapter 2, Alternatives). These elevated sections 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 includes a walking surface and a lateral safety railing, in accordance with standard engineering design requirements (NFPA International 2001). The design also would include ground access from the elevated tracks at regular intervals along the elevated structure.

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

BNSF Alternative Alignment

The BNSF Alternative would have the largest number of aerial structures of any of the project alternatives. It would be elevated at the following locations: south end of the Fresno metropolitan area where the alignment crosses the UPRR and SR99; Conejo where the alignment crosses from the west to the east side of the BNSF; Kings River; Cross Creek; Tule River; Deer Creek; Poso Creek; Wasco; Shafter; and Bakersfield beginning between Jewetta and Calloway and extending to the terminus of the project.

Corcoran Elevated Alternative Alignment

The Corcoran Elevated Alternative would be elevated throughout the city of Corcoran.

Corcoran Bypass Alternative Alignment

The majority of the Corcoran Bypass Alternative would be at-grade. However, two short elevated structures would carry the HST over Cross Creek and the BNSF at the northern end of this alignment and the BNSF and Tule River at the south end of the alignment.

Allensworth Bypass Alternative Alignment

Most of the Allensworth Bypass Alternative would be constructed at-grade. An elevated structure would be built at the northern end of the alignment where it crosses the Alpaugh railroad spur.

Wasco-Shafter Bypass Alternative Alignment

All of the Wasco-Shafter Bypass would be at-grade.

Bakersfield South Alternative Alignment

The Bakersfield South Alternative would have the same length of aerial structure as the corresponding segment of the BNSF Alternative.

Heavy Maintenance Facility Alternatives

The HMF tracks accessing the far main track would be elevated to cross the near track (see Chapter 2, Alternatives).

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 as any incident would be extremely rare. 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 sections 3.11.6, Project Design Features and 3.11.7 Mitigation Measures). 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. Consequently, there would be no impact under NEPA or CEQA.

As described in Section 3.12 (Socioeconomics, Communities, and Environmental Justice) and Section 3.13 (Local Growth, Station Planning, and Land Use), the Fresno and Bakersfield HST 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. The potential Kings/Tulare Regional Station would be located immediately east of the City of Hanford sphere of influence. Kings County has zoned land in the vicinity of the station site for commercial development, and the station could help accelerate this development. The HST stations (and associated redevelopment and economic activity) may also increase demand for local emergency responders, which could increase response times and require new or physically altered government facilities that might impact the environment. This increased demand would be met by paying locally established development impact fees, which could be used to expand nearby facilities if necessary. This is a moderate effect under NEPA and a significant impact under CEQA. Any new or expanded government facilities near the HST stations would be designed and constructed to be consistent with local land use plans, and would be subject to separate site-specific analysis under CEQA.

Development of an HMF alternative in the project vicinity could increase the demand for fire and ambulance services. Because the HMFs would have control access with onsite security, no increased demand for police protection is anticipated. These emergency services are expected to be provided from existing facilities listed in Table 3.11-4.

For the HMFs, this is a moderate impact under NEPA and a 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. Therefore, impacts on the environment would be negligible under NEPA and less than significant under CEQA.

Airports, Private Airstrips, and Heliports

As indicated above, none of the project alternatives encroach on areas covered by airport land use compatibility plans. An analysis of airspace discussed below indicates that none of the project alternatives would intrude upon Part 77 airspace for public service airports. Some project alternatives would be close to a private airstrip. This could result in a substantial effect under NEPA and a significant impact under CEQA.

BNSF Alternative Alignment

As indicated in Table 3.11-5, the BNSF Alternative is within 2 miles of four public-service airports, three private airports, and four heliports. The project would not increase risks to people in the vicinity of the heliports because the HST facilities would not intrude on the flight paths to these heliports. The results of the analysis of Part 77 airspace surfaces are provided in Table 3.11-7. The analysis details are provided in Appendix 3.11-B, Airport Obstructions. As shown in the Table 3.11-7, the BNSF Alternative would not intrude on the Part 77 airspace surfaces of any public-service airport. Therefore, it would not increase risks to people in the vicinity of these airports.

Table 3.11-7
Location of High-Speed Train Facilities Relative to Airport Airspace

Airport	Project Alternative	Closest Vertical Distance from Part 77 Airspace Surfaces
Fresno-Chandler Downtown Airport	BNSF Alternative Alignment	64 feet below horizontal surface
Hanford Municipal Airport	BNSF Alternative Alignment	108 feet below conical surface, 109 feet below horizontal surface
Corcoran Airport	BNSF Alternative Alignment	296 feet below conical surface
Wasco Airport	BNSF Alternative Alignment	64 feet below conical surface
Wasco Airport	Wasco-Shafter Bypass	298 feet below conical surface
Note: A Part 77 airspace surface is an imaginary surface of a takeoff and landing area of an airport or any other imaginary surface established for the airport under 14 CFR Part 77.24.		

The BNSF Alternative would run within 1.61, 1.36, and 0.56 miles of Turner Field, Swanson Ranch Number 1 Airport, and Salyer Farms Airport, respectively. Because these are private airports, they do not have defined Part 77 airspace surfaces. The BNSF Alternative is far enough from these airports that the HST would not result in a safety hazard for people residing or working in the study area, and any potential effects would be negligible under NEPA and impacts would be less than significant under CEQA.

The BNSF Alternative is located approximately 845 feet east of the heliport at the Kings County Fire Department Station #4. In addition, the Houston Avenue overcrossing of the HST alignment is located about 320 feet south of the heliport at its closest point. The Part 77 approach and departure surface for a heliport has an 8 to 1 slope and extends 4,000 feet from the takeoff and landing area which is centered on the helipad. The HST would be at grade in the vicinity of the heliport which would put the top of the catenary system for the train at an elevation of about 35 feet above the ground surface. The helipad Part 77 approach and departure surface is about 105 feet above the ground surface at this location. The helipad Part 77 surface is about 40 feet above the ground surface at its closest point to the Houston Avenue overcrossing. At this location, the overcrossing would be approximately 12 feet above ground surface. None of the proposed HST facilities would penetrate the Part 77 surfaces for the Station #4 heliport. Therefore, the project would have no effect on the heliport under NEPA and there would be no impact under CEQA.

Corcoran Elevated Alternative Alignment

The Corcoran Elevated Alternative would be more than 250 feet below the Part 77 airspace surfaces of the Corcoran Airport. Therefore, it would not increase risks to people in the vicinity of this airport. The Corcoran Elevated Alternative would be 0.3 mile from Salyer Farms Airport. At this distance, the project would not increase risks to people in the vicinity of this airport. Therefore, there are no potential effects on public safety under NEPA and impacts would be less than significant under CEQA.

Corcoran Bypass Alternative Alignment

The Corcoran Bypass Alternative Alignment is not in proximity to any public service airport. It is within 0.07 mile of the Salyer Farms Airport. The location of the HST this close to the airport would be a hazard to aviation and therefore would pose a hazard for people residing or working in the project area. This would be a substantial effect under NEPA to the Salyer Farms Airport and would be a potentially significant impact under CEQA.

Wasco-Shafter Bypass Alternative Alignment

The Wasco-Shafter Bypass Alternative would not intrude on the Part 77 airspace surfaces of the Wasco Airport (Table 3.11-7). Therefore, it would not increase risks to people in the vicinity of this airport.

Bakersfield South Alternative Alignment

The Bakersfield South Alternative is not in proximity to any public-service airport or private airstrip.

Heavy Maintenance Facility Alternatives

None of the HMF alternative sites are in proximity to any public-use airport or private airstrip.

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.

There are building codes and safety regulations that 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. There are many tall structures such as silos and elevators located adjacent to railroads and highways throughout the Central Valley, including those along the HST alternative alignments described above. There is no available information to indicate 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 negligible under NEPA and less than significant under CEQA. Should an incident occur adjacent to the HST alignment, appropriate measures would be taken to minimize risk to passengers and employees.

Hazards to Schools and Residences

As indicated in Table 3.11-6, the BNSF Alternative Alignment would encroach on the campus of Bakersfield High School and would be close to other schools. The HST alternative alignments are within one to two blocks of residential areas in Fresno, Corcoran, Wasco, and Shafter, and go through residential areas in Bakersfield. 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 left the HST right-of-way and collided with other structures or people on adjacent properties.

As discussed above, a basic design feature of an HST system is to contain train sets within the operational corridor. Thus, 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 in the HST right-of-way, the proposed project would not substantially increase hazards to nearby schools, and resulting effects are considered negligible under NEPA and impacts would be less than significant under CEQA.

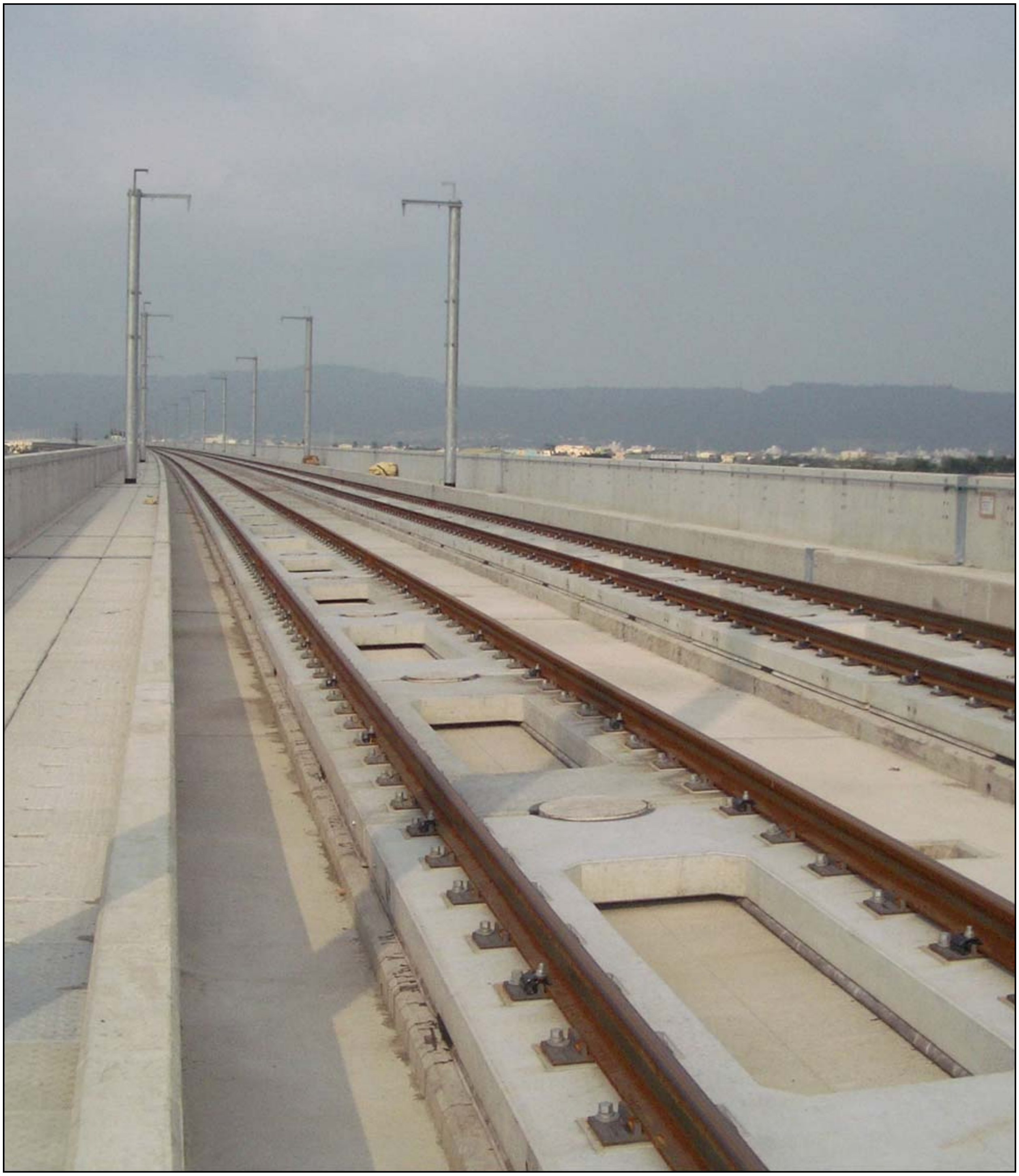
Hazards from Flooding

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 flow to California's Central Valley to provide water for irrigation, drinking, recreation, and flood control. As discussed in Section 3.9, Geology, Soils, and Seismicity, failure of Redbank, Fancher Creek, Pine Flat, Terminus, Success, or Isabella dams could result in inundation of 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 above. DSOD engineers inspect over 1,200 dams each year to ensure they are performing and are being maintained in a safe manner. These inspections include 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 negligible under NEPA and impacts would be less than significant under CEQA.

Common Security Impacts

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 could deter such acts and facilitate early detection. They would also help to prevent suicide attempts. The system features include sensors on perimeter fencing, closed-circuit television, and security lighting where appropriate. These system features would reduce the potential for successful criminal and terrorist acts to negligible effects under NEPA and less than significant impacts under CEQA.



Source: URS, 2010.

Figure 3.11-8
Derailment wall and parapet

Source: URS, 2010.

Figure 3.11-9
High-speed train derailment

3.11.6 Project Design Features

Project design would incorporate engineering measures and BMPs based upon federal and state regulations and on the Statewide Program EIR/EIS (Authority and FRA 2005). 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 (PHA), collision hazard analysis (CHA), and threat and vulnerability assessment (TVA) methods.
- PHAs follow the U.S. Department of Defense's System Safety Program Plan Requirements (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that the design can address and either eliminate or minimize them.
- TVAs 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 right-of-way fencing, intrusion detection, security lighting, security procedures and training, and closed-circuit televisions. Intrusion detection technology could also alert to the presence of inert objects, such as toppled tall structures or derailed freight trains, and 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 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 present along at-grade sections of the alignment to allow for 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 (SSPP) incorporate FRA requirements and are implemented upon FRA approval. SSPPs 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 FRA requirements for tracks, equipment, railroad operating rules, and practices, including the Passenger Equipment Safety Standards (49 CFR Part 238), *Highway-Rail Grade Crossing Guideline for the High-Speed Passenger Rail* (FRA 2009), and track safety standards (49 CFR Part 213). Requirements include warning systems and barrier systems to enhance track safety.

- 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). OSHA establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, OSHA enforcement of workplace requirements is performed by Cal OSHA. Under Cal OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program.

3.11.7 Mitigation Measures

- **S&S-MM#1: Compensation for Loss of a Private Airstrip.** Provide compensation to the property owner of a private airstrip where the airstrip could no longer be used because of the proximity of HST facilities. Compensation is provided when the property owner planned to otherwise continue airstrip operations. The choice of continued operation is based on use of the airstrip for 3 years prior to project construction.

- **S&S-MM #2: Pay Impact Fee to Local Fire, Rescue, and Emergency Service Providers for Services at Stations and at the HMF.** As the project is implemented and creates an increased demand for services, pay a fair share impact fee to local service providers for the increased services attributable to the project.

No secondary effects are anticipated with any of the above mitigation measures. These mitigation measures would substantially lower impacts of safety and security hazards.

3.11.8 NEPA Impacts Summary

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.

- Negligible effect resulting from accident risk at construction sites with implementation of a standard CSHP.

- Negligible effect from detours around construction sites on number of accidents and emergency response times with implementation of construction transportation plan and traffic control plan.

- No effect from train-to-train collisions with implementation of design approach.

- Negligible effect from collisions with vehicles with implementation of design standards.

- Negligible effect from train derailment with implementation of design standards.

- No effect on motor vehicle, pedestrian, and bicycle safety due to roadway improvements.

- Negligible effects from seismic and fire risks with implementation of design features and standard operating and emergency response plans.

- Negligible effect 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.
- Moderate effect on emergency services or facilities at stations and HMFs.
- Substantial effects from proximity to a private airstrip along the Corcoran Bypass Alternative.
- Negligible effect from flood hazards.
- Negligible effects from criminal and terrorist activity with implementation of standard design features and operating plans.
- Negligible effects from proximity to Bakersfield High School along the BNSF Alternative.

Residual effects of the project on safety and security following mitigation would be negligible. Risks associated with aviation accidents and HST operations would be foregone by closing private airstrips adjacent to HST facilities. The Authority would compensate fire, rescue, and emergency service providers for increased services required because of the project.

3.11.9 CEQA Significance Conclusions

Table 3.11-8 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 3.11-8
CEQA Significance Conclusions for Safety and Security

Impact	CEQA Level of Significance before Mitigation	Mitigation Measure	CEQA Level of Significance after Mitigation
Project Impacts - Security			
S&S#1: Proximity of a private airstrip to HST facilities along the BNSF Alternative with the Ave 21 Wye	Potentially significant	S&S-MM#1: Compensation for the Loss of a Private Airstrip	Less than significant
S&S # 2: Increased demand for fire, rescue, and emergency services at stations and HMFs	Significant	S&S-MM# 2: Pay Impact Fee to Local Fire, Rescue, and Emergency Service Providers For Services At Stations and at the HMF	Less than significant

This page left blank intentionally