3.12 SAFETY AND SECURITY

3.12.1 Regulatory Setting

3.12.1.1 State and Federal

Federal Railroad Administration

The Federal Railroad Administration (FRA), under the umbrella of the U.S. Department of Transportation (USDOT), was created by the *Department of Transportation Act of 1966* (49 United States Code [USC] 103, Section 3[e][1]). The FRA was created primarily to promulgate and enforce rail safety regulations, administer railroad assistance programs, and conduct research and development in support of improved railroad safety and national rail transportation policy.

The FRA Office of Safety promotes and regulates safety throughout the nation's railroad industry. FRA inspectors specialize in five safety disciplines and numerous grade-crossing and trespass-prevention initiatives (e.g., track, signal, and train control; motive power and equipment; operating practices; hazardous materials; and highway-rail crossing safety). The office trains and certifies State of California safety inspectors to enforce federal rail safety regulations. Central to the success of the rail safety effort is the ability to understand the nature of rail-related accidents and analyze trends in railroad safety. To do this, the Office of Safety collects rail accident or incident data from the railroads and converts this information into meaningful statistical tables, charts, and reports.

Public Transportation Safety Act of 2010

The Public Transportation Safety Act of 2010 implemented a comprehensive approach to transportation safety by establishing a national public transit safety plan, improving State and federal oversight, requiring local public transportation agency safety plans, empowering USDOT with new enforcement authority, and implementing a system to monitor the safety and condition of the nation's transit infrastructure and equipment. Details regarding these strategies include the following:

- **Improve Safety by Establishing a National Public Transportation Safety Plan**—*The Public Transportation Safety Act of 2010* establishes a national public transportation safety plan to improve the safety of all public transportation systems that receive federal funding.
- **Focus on Safety by Requiring Public Transportation Agencies to Establish Comprehensive Safety Plans**—A focus on safety at public transportation agencies encourages a "culture of safety" in which each employee completes a safety training program that includes continuing safety education and training.
- **Improve the Effectiveness of State Safety Oversight Agencies and Increase Federal Funding**—States submit proposals for state safety oversight programs for rail fixed-guideway public transportation systems to the secretary and, upon approval, receive funding at an 80 percent federal share.
- **Provide New Enforcement Authority over Public Transportation Safety to the Secretary of Transportation**—In the event that a public transportation agency violates federal safety law, the Secretary of Transportation has the authority to require more frequent oversight, impose more frequent reporting requirements, impose conditions on grants, withhold grant funds, and impose civil penalties.

- **Establish a System to Monitor and Manage Transit Assets to Improve Overall Safety**—As public transportation systems age, the likelihood of accidents increases. The Secretary of Transportation is required to define the term "state of good repair," including objective standards for measuring the condition of capital assets. Recipients are required to establish and use an asset management system to develop capital asset inventories and condition assessments and report on the condition of their system as a whole, including a description of the change in overall condition since the last report.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) has regulatory and safety oversight responsibilities pertaining to railroads and rail transit systems in California. The CPUC, which coordinates with FRA, is the largest participating state agency in the nation that ensures railroad compliance with federal railroad safety regulations resulting from the 1970 Federal Railroad Safety Act, as codified in Part 49 of the Code of Federal Regulations (CFR).

The CPUC's regulatory and safety oversight responsibility is divided among three branches within the Consumer Protections and Safety Division: 1) Railroad Safety, 2) Highway-Rail Crossing Safety, and 3) Rail Transit Safety. The Railroad Safety branch oversees heavy freight and passenger railroads. The Highway-Rail Crossing Safety branch is responsible for implementing the CPUC's Highway-Rail Crossing Program, which oversees the safety for all public and private highway-rail crossings in California. The CPUC authorizes the construction of new at-grade highway-rail crossings and the construction of underpasses and overheads. CPUC staff review proposals for crossings, investigates deficiencies related to warning devices or other safety features at existing at-grade crossings, and recommends engineering improvements to prevent accidents. Other activities include developing and enforcing uniform safety standards, analyzing data for crossing closures, reviewing grade-crossing warning devices, and analyzing rail accident data for the CPUC's *Annual Report of Railroad Accidents Occurring in California*. The Rail Transit Safety branch covers light rail, rapid rail, and cable cars. The CPUC's authority over transit agencies is based in State law and delegated by FRA through CFR 49, Part 659. The Rail Transit Safety branch oversees the safety of public transit guideways and ensures that transit agencies have and follow system safety programs that integrate safety in all facets of transit system operations.

The State of California, through Section 99152 of the Public Utilities Code, requires the CPUC to develop an oversight program that establishes safety criteria, guidelines, safety standards, and safety procedures to be met by operators in the design, construction, and operation of guideways. To implement this mandate, the CPUC has issued several general orders that address the requirements for the construction and operation of light-rail transit (LRT) lines. At-grade or grade-separated LRT crossings cannot be constructed or operated unless there is an approval from the CPUC, as provided in General Order 164-D.

With respect to safety issues, the CPUC has adopted General Order 143-B, Safety Rules and Regulations Governing Light-Rail Transit in California. The order describes all the general requirements for LRT, including braking, lighting, operating speeds, right-of-way standards, and the requirements for maintenance of light-rail vehicles (LRV). In accordance with General Order 143 B, all LRV equipment will be maintained in safe proper working condition.

California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for the design, construction, maintenance, and operation of the California State Highway System as well as that portion of the Interstate Highway System within the state's boundaries. Alone and in partnership with Amtrak, Caltrans is also involved in the support of inter-city passenger rail service in California and is a leader in promoting the use of alternative modes of transportation. In 1972, Assembly Bill 69 set down the current framework of Caltrans.

Two Caltrans programs are specifically designed to improve railroad safety: 1) the Caltrans Rail Safety Program and 2) the California Operation Lifesaver Program. The Caltrans Rail Safety Program focuses on vehicular and pedestrian accidents involving passenger trains financed by Caltrans. The California Operation Lifesaver Program emphasizes education pertaining to safety issues, including highway-rail crossing-related accidents. A few educational programs offered by the California Operation Lifesaver Program include the "Highways or Dieways" campaign, which alerts the public to the dangers of vehicle and train accidents through television public service announcements, public service radio announcements, and magazine and newspaper advertising. Pedestrian safety is the California Operation Lifesaver Program's primary priority.

3.12.1.2 Regional

Los Angeles County Metropolitan Transportation Authority

The Los Angeles County Metropolitan Transit Authority (Metro) operates bus, light-rail, and heavy-rail lines for daily passenger service. Metro also owns a railroad right-of-way over which Metrolink trains are currently operating. As part of its responsibilities, Metro implements its System Safety Program Plan to maintain and improve the safety of commuter operations, reduce costs associated with accidents, and comply with State regulations. These safety measures have been established to ensure worker and passenger safety, crime prevention, adequate emergency response, and emergency procedures to be followed in the event of a natural disaster. Metro currently provides police surveillance (via contracts with the Los Angeles County Sheriff's Department [LASD]), non-uniformed police inspectors on transit buses and at major transit nodes, closed-circuit television surveillance in some locations, and an emergency radio response system.

Metro is responsible for compliance with all CPUC regulations governing the safe operation of the transit systems, both for patrons and its employees. The Metro Emergency Response Procedures are incorporated into Metro's standard operating procedures and address the potential for emergencies to occur and the ways in which Metro employees are to respond.

Section 12 of the Metro *Design Criteria Manual* identifies the methods by which Metro, along LRT lines, constructs, maintains, and monitors the relative safety of its facilities. It provides specific direction regarding the categorization of potential hazards and discusses the actions to be taken, including suspension of LRT operations, should a potential safety and security risk arise. The Metro *Design Criteria Manual* requires the preparation of a Functional Hazard Analysis, which determines the potential for a loss or malfunction for each and every LRT operation and categorizes the effect on equipment, personnel, patrons, and the general public to determine the associated hazard level (Category I, II, III, IV), as defined in the American Public Transportation Association's *Manual for the Development of Rail Transit System Safety Program Plans for Commuter Railroads*. The Metro *Design Criteria Manual* also

outlines four basic methods of resolving or addressing any potential safety and security concerns. These include the following:

- Elimination through design/redesign.
- Minimization through the provision of additional safety features.
- Installation of warning devices to detect the condition and generate an adequate warning signal to correct the hazard or provide for operating personnel/public reaction.
- Specialized procedures and training.

It should be noted that, to resolve a potential safety risk, a combination of any of the four methods may be used, as determined by the results of the Functional Hazards Analysis.

Metro's Fire/Life Safety Design Criteria address specific fire protection requirements for the design and construction of LRT systems and equipment. The criteria establish minimum requirements, which provide a reasonable degree of safety from fire and related hazards. The criteria identify and discuss fire safety as it corresponds to the following specific design criteria: station and guideway facilities; passenger vehicles; vehicle yard and maintenance facilities; system fire/life safety procedures; communications; rail operations control; and inspection, maintenance, and training.

Over the last 10 years, Metro has established several transit-specific projects and programs to enhance safety for its passengers, employees, and the community. These include the following:

- Installing photo equipment on vehicles to permit live video surveillance and recording.
- Direct communication between drivers and the LASD Transit Dispatch/Emergency Response Center.
- The Transit Safety Awareness Program, which communicates safety information to motorists and pedestrians through transit user aids, bus stop information signs, and the Internet.
- The "Safety Begins With Me" campaign, which promotes safety around Metro trains and buses through newspaper and outdoor advertisements, and a community safety outreach program to remind citizens of their responsibilities and make them aware of their own safety when riding Metro rail lines and buses.
- The "Metro Experience" mobile safety theater, which educates the public about rail safety through the use of advanced video and 3-D effects that simulate the true operation of a Metro train. It provides an opportunity to make a compelling and lasting impression on children and adults about rail safety.
- Metro's Injury and Illness Prevention Program, which addresses workplace safety procedures, communication with employees regarding health and safety issues, the identification and resolution of unsafe conditions, procedures for investigating workplace injuries and illnesses, and occupational health and safety training.
- Community Emergency Response Training, in collaboration with the Los Angeles City Fire Department, in which employees are trained in earthquake awareness, disaster medical procedures, and rescue operations.
- Installing four-quadrant gates at highway-rail grade crossings to deter motorists from driving around the lowered gates.
- Installing pedestrian swing gates and pedestrian automatic gates at pedestrian crossings of LRT trackways to control pedestrian movement.

- Photo enforcement of grade-crossing violations (e.g., at various crossings along the Blue Line) to discourage motorists from driving around lowered gate arms.
- The "See Something Say Something" program has been adopted by LASD and Metro as part of a national approach to encouraging passengers to participate in the security process by reporting suspicious items or activity.
- Metro's Community Relations Rail Safety Education programs that engage all nearby schools and other public groups who may be impacted by the operation of a rail transit line in their community.

3.12.2 Existing Conditions

3.12.2.1 Metro Station Design and Operation Standards

Metro facilities are safeguarded by security cameras and law enforcement personnel dedicated to the Metro system. Criminal reports or arrests, other than those made by special enforcement officers, remain the jurisdiction of the local law enforcement agency where the activity occurs.

The design of existing Metro fixed-rail facilities (including vehicles, stations, parking lots, etc.) is intended to provide a safe, secure, and comfortable transit system. Included among these features are station and platform amenities, park-and-ride lots, and security lighting. Some locations may include an Advanced Traveler Information System, bike lockers, map cases, and ticket vending machines. Security-related design features may include emergency telephones at station platforms, public announcement systems, open sightlines, graffiti-resistant material, crosswalks, and a contract for security patrol.

The LASD Transit ~~Police~~ Services Bureau (TSB) provides security services for Metro patrons, employees, and facilities. In addition, the TSB is responsible for reviewing the security and law enforcement aspects of the Metro Design Criteria and the design and construction of new projects. Both special officers and deputies are assigned to Metro to provide law enforcement services, including field response at minor incidents involving Metro vehicles, as well as regular patrols of Metro property. ~~LASD~~ The TSB also provides special enforcement deputies who work both in uniform and plain clothes, depending on the type of enforcement conducted. Sheriff's are on duty during system hours of operation, with detective support 10 hours per day, Monday through Friday. ~~LASD~~ The TSB also oversees the Metro security force, which patrols Metro headquarters and Metro bus and rail yards, as well as a Metro counter-terrorism and threat assessment team.

Also, in an effort to reduce the number of "S-turns" (which describe the maneuvers motorists make to drive around closed traffic gates), Metro installed four-quadrant gates rather than the conventional two at historically accident-prone at-grade crossings. This program applies to the Metro Blue Line and Metro Gold Line Phase I (Los Angeles – Sierra Madre Villa), as well as the recently opened Metro Exposition (Expo) Line. It would also apply to all phases of the Metro Gold Line Foothill Extension. Metro attributes most accidents involving Metro Blue Line trains or motor vehicles to the growing number of motorists who make illegal left turns into the path of trains along streets where rail lines run down the middle of the street. The four-gate intersection is designed to prevent illegal left turns.

3.12.2.2 Metro Blue Line Grade-Crossing Safety Improvement Program

Metro has adopted the Metro Blue Line Grade-Crossing Safety Improvement Program. This program is designed to reduce the number of accidents and enhance public safety at crossings. It includes

engineering, enforcement, education, and legislation to effectuate this improvement. Specifically, this program:

- Established a traffic detail with the Los Angeles Sheriff's Department (LASD) for increased enforcement of traffic violations at Metro Blue Line at-grade crossings. In a 90-day trial, traffic detail deputies wrote 7,760 citations. During the length of the detail, deputies wrote more than 14,000 citations.
- Installed photo enforcement cameras to photograph motorists who drive under or around railroad crossing gates. Two photographs, one of the vehicle's license plate and the other of the driver's face, are taken as the basis for issuing a citation. The camera equipment is mounted in a 12-foot-high, bullet-resistant cabinet.

The result of these efforts was a 92 percent reduction in the number of violations occurring at the at-grade crossings. The success of LASD's enforcement and photo enforcement programs at Metro indicates that these same programs can be applied to any urban LRT system that has at-grade railroad crossings.

Pedestrian and transit patron safety, as well as the safety of train operations, is a major concern, especially with trains that operate on city streets during weekday peak hours. In response to this concern, the possible number of LRT accidents that might occur in the Foothill Extension corridor was estimated using Metro Blue Line data gathered from Metro's Corporate Safety Department. The decision to use Metro Blue Line data to estimate the number of potential Foothill Extension accidents stems from the similarities between the Metro Blue Line and the Foothill Extension. Similar to the Metro Blue Line, the Foothill Extension would run through dense urban environments with numerous at-grade crossings, and heavy freight trains may use the tracks alongside the LRT alignment.

Most train accidents fall into two categories: railroad-only accidents and accidents at at-grade crossings. The causes of railroad-only accidents include human error, equipment failure, or track failure. Accidents at at-grade crossing are caused by vehicles or pedestrians attempting to cross the tracks before a train passes through. These include derailments, head-on collisions, and rear-end collisions.

According to Metro Blue Line data, the overall accident rate, based on a five-year average, has declined from 4.09 per 100,000 train miles in the first five years of Metro Blue Line operations (1990–1995) to 1.09 in the past five years (2005–2010). The number of train-vehicle accidents has also declined. Furthermore, the number of fatalities from those types of accidents has fallen from 21 in the 1990s to five in the 2000s. The decline in the number of accidents is attributed largely to recent Metro Blue Line safety improvements.

Since the Metro Blue Line opened, Metro has made several safety improvements. These include installing four-quadrant crossing gates at six intersections, reducing the height of fencing along the tracks so that train operators have a better view of cross traffic, installing a "cyclops" light on trains to improve their visibility, and adding pedestrian gates at several crossings. In addition, light-emitting diode (LED) "TRAIN" signs have been installed to deter motorists from making illegal left turns in front of the train and running red lights.

In the past two decades (1990 through 2010), 26 motorists have been killed in collisions with the Metro Blue Line; 51 pedestrians have been struck and killed by the train. Another 22 died, including 14 in the past decade, in incidents ruled suicides by the Los Angeles County Coroner. All told, there have been 99 fatalities involving the Metro Blue Line in the first two decades of its operation. Many of these accidents

might have been prevented if four-quadrant gates had been installed at high-risk intersections to reduce the number of illegal left turns by impatient or confused motorists. Also, well-maintained, demarcated pedestrian crosswalks and large, clearly written bilingual instructional signs would have reduced the number of confused pedestrians around at-grade crossings.

Four-quadrant gates are a design standard for this project, and all pedestrian crosswalks would be designed in accordance with CPUC and Metro requirements; therefore, because the Foothill Extension would implement these safety features, the potential for accidents is estimated to correspond to the recent lower accident rates of the Metro Blue Line. However, the Metro Gold Line has not had any fatalities resulting from accidents, according to Metro officials.

Metro's incident rate and fatality rate are on par with other agencies, according to data provided by FTA. It should be noted that Metro offers considerably more "passenger miles" of LRT service than other agencies, and that all fatalities have been on the Metro Blue Line. The Metro Green Line, which is completely grade-separated, and the Metro Gold Line have not had any fatalities resulting from accidents, according to Metro officials.

3.12.2.3 Security

The analysis of security issues focuses on the potential for violent crimes, property theft, fare evasion, and vandalism. To assess impacts, project design features are reviewed in the context of Metro procedures and prior experiences of other rail systems. Crime data from the LASD Transit Services Bureau related to Metro operations were examined. The statistics compiled by the Bureau for 2007 through 2009, which include train, bus, and rights-of-way, are shown in Table 3.12-1. Larceny theft, robbery, grand theft auto, aggravated assault, and vandalism on Metro property occur more than other crimes.

Table 3.12-1. LASD Transit Services Bureau, Incident Detail for Metro Train/Bus Facilities and Rights-of-Way

Crime	2009	2010	2011
Larceny Theft	528	583	576
Robbery	285	292	261
Grand Theft Auto	126	144	123
Aggravated Assault	160	237	237
Burglary	15	12	13
Arson	4	3	5
Forcible Rape	5	1	3
Homicide	0	2	2
TOTAL *(minus vandalism)*	**1,123**	**1,274**	**1,220**
Vandalism	1,065	454	357

Source: LASD Transit Services Bureau 2009, 2010, 2011; ICF International, 2012.

3.12.2.4 Emergency Response

Station and track design (e.g., access, layout, exits, alarms, and evacuation infrastructure) and operational procedures (e.g., interagency agreement, training, and evacuation) are pertinent to the effectiveness and timeliness of emergency response. Section 3.5 has a more in-depth discussion about emergency response during construction and operation of the project.

City of Glendora

There would be ~~eight~~ nine at-grade crossings located in Glendora. The crossing with the highest volume of grade crossings is at Foothill Boulevard and Grand Avenue. LRT and freight tracks would run diagonally through this intersection.

Police protection services are provided by the Glendora Police Department. The police station is located 0.15 miles from the proposed corridor. Fire protection services are provided by LACOFD Station 151, which is located 0.25 miles from the project alignment in Glendora.

City of San Dimas

The proposed LRT alignment in San Dimas would be surrounded ~~entirely~~ mostly by residential, mixed use, industrial or commercial development. East of Gladstone Avenue, there is a small cluster of single-family homes. Single-family and apartment units are also present on the north side of the Metro right-of-way between SR 57 and Eucla Avenue. There is a third cluster of residences along the north side of the Metro right-of-way, approximately 1,000 feet west of San Dimas Canyon Road.

There would be ~~seven~~ six at-grade crossings in San Dimas. The highest volume crossing would be at Bonita Avenue and Cataract Avenue. LRT and freight tracks would run diagonally through this intersection.

Police protection services are provided by LASD. The San Dimas substation is adjacent to the proposed corridor. Fire protection services are provided by the Los Angeles County Fire Department (LACOFD) Station 64, which is located 0.10 miles from the alignment in the San Dimas.

City of La Verne

Aside from one residential area along the north side of the Metro right-of-way (between Wheeler Avenue and B Street) and one residential area along the south side of the Metro right-of-way (west of Fulton Road), the LRT alignment in La Verne is ~~entirely~~ mostly within an industrial or commercial area. There would be five at-grade crossings in La Verne.

Police protection services are provided by the La Verne Police Department, which is located 0.10 miles from the alignment. Fire protection services are provided by La Verne Fire Department Station 1, which is located 0.2 miles from the corridor.

The City of La Verne General Plan specifically mandates the City to, "conduct a survey of traffic accidents to identify dangerous intersections and railroad grade crossings (both existing and proposed) and develop improvements for identified intersections." The plan also decrees that the City will educate its residents so they can protect themselves against avoidable accidents, patrol its neighborhoods for dangerous activity, and provide a fully staffed and properly equipped police and fire force. In addition, the plan states that the City will "continue to fund Neighborhood Watch programs" and "apply standards for defensible space as part of the City design review process."

City of Pomona

Aside from a residential area on the north side of the Metro right-of-way, just west and east of Carnegie Avenue (approximately 600 feet) and a residential area on the south side of the Metro right-of-way just west of Towne Avenue, the proposed LRT alignment in Pomona would be ~~entirely~~ mostly within an

industrial or commercial area. Metrolink's San Bernardino Line would abut the south side of Metro's right-of-way for the entire LRT alignment through the City of Pomona.

There are two at-grade crossings in Pomona. One grade crossing would be at Fulton Road. The other grade crossing would be at Garey Avenue, which serves as one of Pomona's major north-south arterials to I-210. According to the Milestone 1 Grade Crossing analysis, the traffic volume at this crossing is below the threshold needed to merit grade-separation.

Police protection services in Pomona are provided by LASD from the San Dimas substation, which is located 3.15 miles from the project alignment. Fire protection services are provided by LACOFD Station 186, which is located 0.15 miles from the alignment.

The City of Pomona General Plan states that, "traffic safety is also an important consideration when rail lines cross public streets. Grade-separated crossings have been used at major rail crossings in the central-core area and have greatly improved traffic circulation and safety there."

City of Claremont

~~Aside from residential areas along the north side of the Metro right-of-way, between Carnegie Avenue and Indian Hill Boulevard and between Claremont Boulevard and the Los Angeles county line, t~~The LRT alignment in Claremont would be bordered ~~entirely~~ mostly by residential, industrial, commercial, and university-owned properties. Metrolink's double-track San Bernardino Line runs parallel to and south of the proposed LRT alignment.

Configuring the LRT tracks within the confined area around the historic Atchison, Topeka and Santa Fe railroad station would require relocating most of the Metrolink tracks within the city. BNSF freight service shares the Metrolink tracks just west of Cambridge Avenue. It should be noted that there is a residential area south of the Metrolink tracks, between Claremont Boulevard and the boundary for Los Angeles County.

Four at-grade crossings are located in Claremont. The highest volume crossing is Indian Hill Boulevard, which is the main north-south arterial through Claremont, connecting the downtown district to I-10.

Police protection services are provided by the Claremont Police Department. The police station is located 0.2 miles from the project alignment. Fire protection services are provided by LACOFD Station 101, which is located 0.2 miles from the alignment.

The City of Claremont General Plan mandates that, "the City shall encourage the use of design concepts facilitating defensible space and other means of inhibiting crime."

City of Montclair

There would be no at-grade crossings in Montclair. Throughout Montclair, the Metro right-of-way abuts residential, industrial and commercial uses. A pedestrian tunnel that crosses under the westbound Metrolink track connects surface parking lots to Metrolink platforms. As part of the project, this pedestrian tunnel would be extended northward to cross under the Metro Gold Line tracks and connect with the LRT platform.

Police protection services in the City of Montclair are provided by the Montclair Police Department. The police station ~~is located 1.5 miles~~ abuts~~from~~ the project alignment at 4870 Arrow Highway. Fire

protection services are provided by the Montclair Fire Department. The closest station is located 0.2 miles south ~~from~~ of the alignment at 8901 Monte Vista Avenue.

3.12.3 Environmental Impacts

3.12.3.1 Evaluation Methodology

The evaluation of pedestrian, bicyclist, and motorist safety along the project alignment takes into account the safety records of construction and operation of LRT systems in the region, including Metro's Blue Line, Gold Line, Green Line, and Orange Line Bus Rapid Transit. Data for this section are from LASD and other law enforcement agencies, LACOFD, other participating city fire departments, and the regulations identified in Section 3.12.1.

3.12.3.2 Impact Criteria

Impact on safety and security is considered significant if the project would:

- Create the potential for increased pedestrian and/or bicycle safety risks
- Create substantial adverse safety conditions, including station, boarding, or disembarking accidents; right-of-way accidents; collisions; fires; or major structural failures
- Substantially limit the delivery of community safety services, such as police, fire, or emergency services, to locations along the proposed alignment
- Create the potential for adverse security conditions, including incidents, offenses, and crimes

3.12.3.3 Short-Term Construction-Impacts

No Build Alternative

Under the No Build Alternative, the project would not be constructed. The No Build Alternative would maintain current Metro and Foothill Transit routes in the Study Area; therefore, there would be no change from existing safety and security conditions within the existing Metro right-of-way and the surrounding Study Area cities. No new impacts to safety and security would occur under this alternative.

Transportation Systems Management (TSM) Alternative

The TSM Alternative would reconfigure existing Metro and Foothill Transit bus operations to enhance service to cities within the Study Area. It would require no major construction to implement. Safety requirements for construction of any Metro or Foothill Transit facilities that might be required, such as additional or larger bus stops, would be adhered to. Typical of construction sites, concrete barriers with fencing would be placed around the perimeter of the site to restrict access and eliminate the threat to safety and security of anyone not directly involved in construction activity. These barriers would minimize theft of construction materials and/or trespassing onto the construction site. Construction sites located near schools could pose an additional risk to students who pass on their way to or from school. Any additional related activity would be implemented in accordance with all federal and State requirements and permits during the construction process. Under the TSM Alternative, construction impacts would be less than significant.

Build Alternative

Construction of the Build Alternative may have temporary significant impacts on public safety and security within the cities in the Study Area. During construction, motorists, pedestrians, and bicyclists would experience additional safety hazards. This would result from the number and proximity of vehicles and people adjacent to LRT construction, as well as right-of-way improvements. Relocation of the railroad tracks and construction of the project would take place directly next to the active train operations, creating increased potential risks for train accidents. The potential for such significant safety and security impacts would be minimized by compliance with Occupational Safety and Health Administration (OSHA), California Occupational Safety and Health Administration (Cal/OSHA), and Metro safety and security programs, which are designed to reduce potential impacts during construction to less than significant levels.

Incidents of crime adjacent to the project alignment would not likely increase during construction of the Build Alternative. Incidents of property crime could occur at construction sites (e.g., theft of construction machinery and materials), but they would be minimized through implementation of standard site security practices by contractors. These practices have been shown to reduce potential impacts to less than significant levels.

3.12.3.4 Long-Term Impacts

No Build Alternative

The No Build Alternative would not result in any long-term pedestrian, bicyclist, or motorist impacts because it would maintain existing transit service and roadway conditions. The No Build Alternative would also not result in any security impacts because present security conditions would be maintained. In addition, it is not expected that increased traffic congestion within the corridor in future years would have a direct effect on pedestrian, bicyclist, or motorist safety, other than possible increases in cut-through traffic in residential areas (i.e., where vehicles attempt to bypass congested intersections by cutting through residential areas). See Chapter 2.0 for forecasted traffic conditions for the No Build Alternative.

Transportation Systems Management (TSM) Alternative

Safety

Under the TSM Alternative, existing Metro and Foothill Transit bus operations would be reconfigured to enhance service to cities within the Study Area. This would not result in any significant safety impacts on pedestrians, bicyclists, or motorists.

Security

Under this alternative, the reconfiguration of existing Metro and Foothill Transit bus operations would not result in any adverse security impacts. Any new Metro or Foothill Transit bus line would have the same level of security as current Metro and Foothill Transit bus lines.

Build Alternative

Pedestrian and Bicyclist Safety

The Build Alternative could have various safety impacts. A review of data from prior research and safety oversight authorities and recent surveys of LRT employees in the western United States reveals that pedestrian or bicyclist collisions with LRTs can be divided into two general types. The first type involves

collisions that occur along the LRT right-of-way, including collisions at crossings and incidents where pedestrians/bicyclists cross the tracks and intrude on the right-of-way (trespassing). Statistics from Metro's accident history records reveal that a high percentage of pedestrian and bicyclist accidents occur at crossings. The second type involves collisions that occur at station platforms. Because of the inherent purpose of a station platform, large numbers of people will converge near the LRTs and cross the adjacent tracks before or after riding the trains. This second type of collision occurs when pedestrians see a train at a station platform and run to catch it, often ignoring warning signals along the way. In some cases, they are hit by a train that was approaching from the opposite direction. These types of accidents are often referred to as "second train" accidents.

The low number of past pedestrian/bicyclist collisions and their unique circumstances do not allow for a valid quantitative projection of future collisions along the proposed LRT alignment. However, some distinct trends are present in the data. For example, collisions with pedestrians/bicyclists are more likely to occur near stations where large numbers of pedestrians cross the tracks. Inattention to pedestrian/bicyclist warning devices, whether because of distractions or other causes, is a factor in many of these collisions. The low number of pedestrian/bicyclist collisions with LRTs can be attributed to safe station design, operator training, and public education programs that teach people about potential hazards.

The project would be constructed as a mostly at-grade LRT system, with 26 at-grade crossings. Traffic signal phasing at intersections would be changed to accommodate LRT operations. When LRTs are present, movements that would conflict with the trains would be prohibited. Pedestrians and bicyclists would be permitted to cross the street only when LRTs are not present.

The evaluation of pedestrian and bicyclist safety along the project's right-of-way can be separated into three categories: safety along the tracks, safety at designated grade crossings, and safety at stations.

Safety Along Tracks. At 21 of the 26 at-grade crossings, four-quadrant gates that would restrict pedestrian, bicyclist, and motorist movements when Light Rail Vehicles are present would be installed. The five crossings (Bonita/Cataract Avenues, San Dimas Avenue, E Street, White Avenue, Claremont Boulevard) that do not have full quadrant gates, would have equivalent safety/prevention features, such as a long median to prevent wrong-way traffic at the crossing. Items for pedestrian safety would be the same as for quadrant gates. This approach is acceptable to the CPUC. However, at locations where crossings are not allowed, pedestrians could still attempt to cross the alignment. In adherence to CPUC guidelines, fencing would be provided along the alignment where LRTs travel at speeds in excess of 35 miles per hour. As more detailed design plans are completed, it is anticipated that fencing also will be specified at other locations. This additional fencing would reduce the likelihood of pedestrian crossings at non-designated locations.

Designated Grade Crossings. Pedestrian and bicyclist safety at designated grade crossings would be a key factor in project design. All of the pedestrian crossings would be located where motorists also would cross the tracks. Pedestrian signal heads would be placed at locations where LRT operations would be controlled by traffic signals, and automatic pedestrian gates would be placed at other locations. The type of treatments and warning devices would be based on the LRT alignment type, grade crossing geometry, train operating speed, and pedestrian volumes.

There are 18 educational facilities located within 0.25 miles of the project alignment, including preschools, public schools, private schools, and colleges/universities. At designated pedestrian crossings where the LRT alignment is located within a school zone, automatic gates for pedestrians would be used.

Four-quadrant gates would be implemented at 21 of the 26 at-grade crossings to increase safety. The exact safety measures will be determined through consultation with and approval by the CPUC. Figure 3.12-1 shows at-grade LRT crossings with safety features.

Source TAHA, 2009

Figure 3.12-1. At-Grade Light Rail Transit Crossing with Safety Features

As part of the grade crossing analysis process mandated by the CPUC, each grade crossing would be evaluated as part of an overall safety evaluation, which would encompass pedestrian, bicyclist, and motorist safety. The evaluation would result in a list of recommended design modifications or refinements to improve the level of safety at the crossings. The specific types of warning devices would be determined by preparing a hazard analysis and conducting joint field diagnostic reviews with all affected parties.

Station Locations. In addition to the safety measures described above for the pedestrian crossings, pedestrian safety would also be taken into account at station locations. Adequate pedestrian queuing and refuge areas would be provided, as well as wide crosswalks to facilitate pedestrian mobility. Parking and bus circulation within or around the station locations would also be integrated into a final design that avoids pedestrian conflicts. Stations would be designed to meet Metro's fire/life safety criteria.

Motorist Safety

Motorist safety along the LRT alignment was evaluated using the methodology described in Metro's *Grade Crossing Policy for Light Rail Transit*. Except for three grade separations (one existing and two new ones), the project would be constructed as an at-grade LRT system with 26 at-grade crossings along the alignment. Signal phasing at signalized intersections with grade crossings would be changed to accommodate LRT operations. When LRTs are present, movements that would conflict with the trains would not be prohibited. Pedestrians and bicyclists would be permitted to cross the street only when LRTs are not present. Additional safety features, such as dedicated left-turn lanes, photo enforcement cameras, and in-pavement lights, would be considered, as appropriate, along this segment. In addition, four-quadrant gates, which would restrict pedestrian, bicyclist, and motorist movements when LRTs are present, would be implemented at 21 of the 26 at-grade crossings. Five crossings that would not have full quad gates would have other equivalent safety and prevention measures, such as dual direction and single-direction gates and long medians, as approved by CPUC. This would largely minimize conflicts between LRTs and pedestrians, motorists, or bicyclists.

There would be three grade-separated crossings, one each at Lone Hill Avenue in Glendora, Towne Avenue in Pomona, and Monte Vista Avenue in Montclair. Because elevated structures at these crossings could affect sight distances for motorists, the spacing of the bridge support columns relative to vehicle movements from left-turn lanes would be considered during final design and developed in close coordination with the jurisdictional agencies.

Security

Rail facilities (such as vehicles, stations, parking lots) would be designed to provide a safe, secure, and comfortable transit system. Transit patrons would be provided with station amenities, such as covered platforms and adequate lighting. In addition, Metro would include security-related design features, such as emergency telephones, public address systems, and closed-circuit monitoring systems.

Elevated portions of the alignment at the three grade separations would require support columns. These columns, spaced approximately 80 to 120 feet apart, would create shadows and possible hiding places, which could add to crime problems in the area (e.g., graffiti). Because the Build Alternative would pass through low-density residential areas as well as industrial and commercial areas, pedestrian traffic near some of the stations could be relatively light during evening and nighttime hours, creating an "isolated environment" at some of the stations. Discussions would be held with local police departments to determine the level of crime activity near the proposed station locations and the best crime prevention practices. Designs for the columns within the elevated portions of the alignment would also be discussed.

The Build Alternative would incorporate all necessary crime prevention measures, including Metro's crime prevention policies, to deter criminal acts and protect passengers, employees, and the community.

The Cities Affected

For the purposes of this report, the safety and security impacts of the project alignment is analyzed below, by city.

City of Glendora

Within Glendora, the LRT alignment would run along the same corridor as Burlington North Santa Fe (BNSF) freight trains. The operation of LRTs would bring a new transportation element to the city, which could increase train collisions with pedestrians, bicyclists, and motorists. However, at-grade crossings would include four-quadrant gates, which would restrict the movement of pedestrians, bicyclists, and motorists when LRVs are present.

City of San Dimas

Seven grade crossings are in San Dimas. The crossing with the most traffic is at the intersection of Bonita Avenue and Cataract Avenue. At this crossing, LRT and freight tracks would run diagonally through the intersection. Crossing gates would be installed at these locations.

The operation of LRTs would bring a new transportation element to San Dimas, resulting in potential train collisions with pedestrians, bicyclists, and motorists. However, at-grade crossings would include four-quadrant gates, which would restrict the movement of pedestrians, bicyclists, and motorists when LRVs are present. The crossings at the intersection of Bonita Avenue and Cataract Avenue, as well as the crossing at San Dimas Avenue, would not have full quadrant gates, but would still have equivalent safety/prevention features The equivalent safety/prevention for a single-direction gate involves a long median to prevent wrong way traffic at the crossing. Items for pedestrian safety at these crossings would be the same as for quadrant gate crossings.

City of La Verne

There are five grade crossings in La Verne. The operation of LRT would bring a new transportation element to La Verne, resulting in a potential for train collisions with pedestrians, bicyclists, and motorists. However, at-grade crossings would include four-quadrant gates, which would restrict the movement of pedestrians, bicyclists, and motorists when LRVs are present. Within La Verne, only the E Street crossing and White Street crossing would not have full quadrant gates, but would have equivalent safety/prevention qualities. The equivalent safety/prevention for a single direction gate involves a long median to prevent wrong-way traffic at the crossing. Items for pedestrian safety at these crossings would be the same as for quadrant gate crossings. In addition, the closure of several existing at-grade crossings would further limit interaction between LRVs and motorists, pedestrians, and bicyclists.

City of Pomona

The two grade crossings proposed in Pomona would be at Garey Avenue and Fulton Road. Garey Avenue is a major north-south arterial that connects to I-210. The Milestone 1 grade crossing analysis found that, according to Metro criteria, the traffic volume at this crossing is below the threshold that would warrant grade-separation. The grade crossing analysis is conducted per Metro's Grade Crossing Policy to determine whether conditions at a crossing warrant grade separation or whether the crossing can be designed at-grade and maintain safe operation for trains, vehicles, pedestrians, and bicyclists.

The operation of LRVs would bring a new transportation element to the city, resulting in a potential for train collisions with pedestrians, bicyclists, and motorists. However, the at-grade crossings at Garey Avenue and Fulton Road would include four-quadrant gates, which would restrict the movement of pedestrians, bicyclists, and motorists when LRVs are present.

City of Claremont

Metrolink's double-track San Bernardino Line runs parallel to and south of the proposed LRT alignment.

There would be the same four grade crossings in Claremont as with Metrolink. The operation of LRT would bring a new transportation element to the city, resulting in a potential increase in train collisions with pedestrians, bicyclists, or motorists. However, three at-grade crossings would include four-quadrant gates, which would restrict the movement of pedestrians, bicyclists, and motorists when LRVs are present. At-grade crossings would either have full quadrant gates or equivalent safety/prevention features. The equivalent safety/prevention for a single direction gate involves a long median to prevent wrong-way traffic at the crossing. Items for pedestrian safety would be the same as for quadrant gate crossings.

City of Montclair

The Build Alternative would terminate at the proposed Montclair Station.

There would be no at-grade crossings in Montclair. The existing grade separation at Monte Vista Avenue would be retained for use~~, but with minor modifications~~.

3.12.3.5 Cumulative Impacts

The Southern California Association of Governments (SCAG*) 2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) Program Environmental Impact Report* provides a regional cumulative impact assessment for transportation improvement projects (including the project) through 2035. There is nothing inherent to the regional transportation plan or any of its specific projects, modes, or routes that would reasonably be expected to contribute to significant cumulative impacts.

Safety concerns for motorists, pedestrians, and bicyclists would increase locally, particularly if other development and transportation projects are constructed in the vicinity of the alignment proposed for the Foothill Extension. However, it is not expected that this would result in a considerable cumulative impact. With respect to security, the project's potential to increase cumulative security impacts would not be significant because the Foothill Extension's alignment and facilities would be protected by Gold Line security personnel and Metro's station design and operation standards would be implemented. The Los Angeles and San Bernardino Sheriff's Departments' Gold Line security personnel would coordinate security and protection activities with the corridor cities' local police departments.

3.12.4 Mitigation Measures

3.12.4.1 Short-Term Construction Mitigation Measures

The Build Alternative would be constructed in accordance with OSHA, Cal/OSHA, and Metro policies and practices. These practices have been shown to reduce potential impacts to less than significant levels. No additional mitigation measures are required.

3.12.4.2 Long-Term Mitigation Measures

- **SS-1**—All stations and parking facilities shall be equipped with monitoring equipment and/or be monitored by Metro Rail Operations Center staff/LASD TSB Desk Operations ~~Gold Line security~~ personnel on a regular basis.
- **SS-2**—A security plan for LRT operations shall be implemented. The plan shall include both in-car and station surveillance by Metro Rail Operations Center staff/LASD TSB Desk Operations ~~Gold Line security~~ personnel security or other local jurisdiction security personnel.
- **SS-3**—Lighting at all stations shall be to standards that minimize shadows, and all pedestrian pathways leading to/from sidewalks and parking facilities shall be well-illuminated in accordance with Metro Design Criteria.
- **SS-4**—Metro Rail Operations Center staff/LASD TSB Desk Operations ~~Gold Line security~~ personnel shall coordinate and consult with the Los Angeles and San Bernardino Counties sheriff's department and police departments of the cities adjacent to the alignment to develop and implement safety and security plans for the alignment, parking facilities, and station areas.
- **SS-5**—The station design shall not include design elements that obstruct visibility or observation or provide discrete locations favorable to crime, and pedestrian access to at-grade, below-grade, and above-grade station entrances/exits shall be accessible at ground level, with clear sight lines.
- **SS-6**—Metro Rail Operations Center staff/LASD TSB Desk Operations ~~Gold Line security~~ personnel shall monitor pedestrian crossing activity at all locations with adjacent schools and shall implement appropriate measures to ensure pedestrian crossing safety, as determined by the California Public Utilities Commission (CPUC).
- **SS-7**—The Construction Authority shall conduct a hazard analysis before the start of final design, using current safety analysis as a reference. The hazard analysis shall determine a design basis for warning devices, as required by the CPUC.
- **SS-8**—Traffic warning measures, such as signage, shall be provided at locations adjacent to stations to alert motorists to significant pedestrian activity in the area. Traffic warning measures will be per the California Manual of Uniform Traffic Control Devices (MUTCD) specifically Part 10 "Traffic Controls for Highway-Light Rail Transit Grade Crossing.

3.12.5 Level of Impact after Mitigation

With safety and security-oriented project design and the incorporation of mitigation measures SS-1 through SS-8, the Build Alternative project would not result in significant safety impacts.