

3.7 Cumulative Impacts

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act (CEQA) Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under the National Environmental Policy Act (NEPA) can be found in 40 *Code of Federal Regulations* (CFR) Section 1508.7 of the Council on Environmental Quality (CEQ) Regulations.

Affected Environment

Cumulative impacts identified for the HDC are those impacts that result from past, present, and reasonably foreseeable future actions within the cities of Palmdale, Adelanto, Victorville, and Apple Valley, as well as unincorporated Los Angeles and San Bernardino counties in the High Desert region. The study area for each of the resources potentially affected by the cumulative projects is defined below. The affected environment for each of these resources has been previously discussed in their respective portions of Chapter 3.

Long-term growth projections are also considered because they help identify future actions that could contribute to potential cumulative impacts; the project design year (2040) is used as the planning horizon for considering future projects and actions. Table 3.7-1 summarizes the reasonably foreseeable projects considered in the cumulative impact analysis of this project. The table identifies regionally relevant projects, such as transportation and green energy projects located within 5 miles of the proposed alignment and all other development within 2 miles. Projects completed within 3 years, as well as projects within the planning or construction phases, were included in this list. The approximate locations of the cumulative projects are shown in Figure 3.7-1.

Table 3.7-1 Cumulative Projects

	Project Title	Project Description	Lead Agency	Project Status
Transportation Projects				
1	California High Speed Train System (HST)	The California High-Speed Rail Authority proposes a train system capable of operating at speeds in excess of 200 miles per hour (mph) on a fully grade-separated track serving the major metropolitan centers of California. Project segments relevant for the proposed project include Bakersfield to Palmdale and Palmdale to Los Angeles.	The California High-Speed Rail Authority and the Federal Railroad Administration (FRA)	The Bakersfield to Palmdale and Palmdale to Los Angeles segments are still in the environmental review phase. The statewide Environmental Impact Report (EIR)/ Environmental Impact Statement (EIS) is finalized.
2	State Route 138 Safety Improvement Project	State Route 138 Safety Improvement Project – Caltrans proposes to widen the shoulders from 2 to 8 feet, provide 2-foot-wide rumble strips near the edge of traveling roadway in each direction and provide 4-foot-wide median buffer with rumble strips on SR-138 between SR-138/SR-18 Junction (PM 69.3) and the San Bernardino County Line (PM 75.0).	Caltrans	The Mitigated Negative Declaration was issued in April 2013.
3	Route 395 Expressway	The project will reconstruct the existing US 395 to a four-lane expressway facility. It will also provide at-grade intersections for existing street crossings. Phase I is a project to widen US 395 from SR-18/Palmdale Road to Chamberlaine Way in Adelanto and install left-turn pockets at various intersections. Phase II is expected to be a similar widening operation from Chamberlaine Way to Desert Flower Road. Phase III will involve work from I-15 to SR-18.	Caltrans	Project planning is anticipated to be completed in 2017.
4	National Trails Highway Bridge Replacement Project	Replace the existing National Trails Highway Bridge over the Mojave River.	City of Victorville	Project is in the planning phase.
5	I-15/La Mesa/ Nisqualli Interchange	New full-service interchange between the Bear Valley Road and Palmdale Road interchanges.	San Bernardino Associated Governments (SANBAG)	Project completed in 2013.

Table 3.7-1 Cumulative Projects

	Project Title	Project Description	Lead Agency	Project Status
6	XpressWest (formerly DesertXpress)	The project involves construction, operation, and maintenance of a high-speed passenger train along the 200-mile corridor between Victorville and Las Vegas, Nevada. The project would include stations and maintenance facilities at each end of the rail alignment in Victorville and Las Vegas.	FRA	Completed the privately funded planning and engineering stages; in process of acquiring funding for construction.
7	SR-18 and Apple Valley Road Intersection Realignment Environmental and Civil Design Project	This project includes, but is not limited to, drainage improvements, road improvements, and traffic signal improvements where Apple Valley Road and SR-18 meet. The primary goal is to have shelf-ready plans for State or federal funding to be able to construct and realign the portion of Apple Valley Road that is north of SR-18 to line up directly with the portion of Apple Valley Road that is south of SR-18.	Town of Apple Valley	Project is in the design phase; however, there are no current plans for construction.
8	Yucca Loma Road/ Yates Road/Green Tree Boulevard Transportation Improvement	The proposed project will establish a new route across the Mojave River linking Apple Valley and Victorville. The project will widen Yucca Loma Road from Apple Valley Road to its current terminus east of Kasanka Trail, construct a new bridge crossing over the Mojave River extending to Yates Road, widen Yates Road, realign the Ridgecrest Road/Yates Road intersection, and construct an extension of Green Tree Boulevard from the new Ridgecrest Road/Yates Road intersection with a bridge over the BNSF to Hesperia Road.	Town of Apple Valley	Construction anticipated to be completed in 2015.
9	Rancherias Road Rehabilitation Project	This project will consist of the reconstruction of Rancherias Road between SR-18 and Zuni Road. The road will be widened to 44 feet and will add a center turn lane and bike lanes. Drainage improvements will include the installation of a drywell system and intersection improvements.	Town of Apple Valley	Construction is anticipated to begin in 2014.
Energy Projects				
10	Palmdale Hybrid Power Project (PHPP)	The PHPP is located near the Palmdale Airport, 0.33-mile south of Avenue M, east of Sierra Highway, adjacent to Air Force Plant 42. It is an innovative 570-megawatt (MW) electric generating facility. This “hybrid” facility combines the ultra-high efficiency clean burning natural gas technology with renewable solar equipment.	City of Palmdale	Awaiting Power Purchase Agreement (PPA) with Southern California Edison (SCE) before beginning construction.

Table 3.7-1 Cumulative Projects

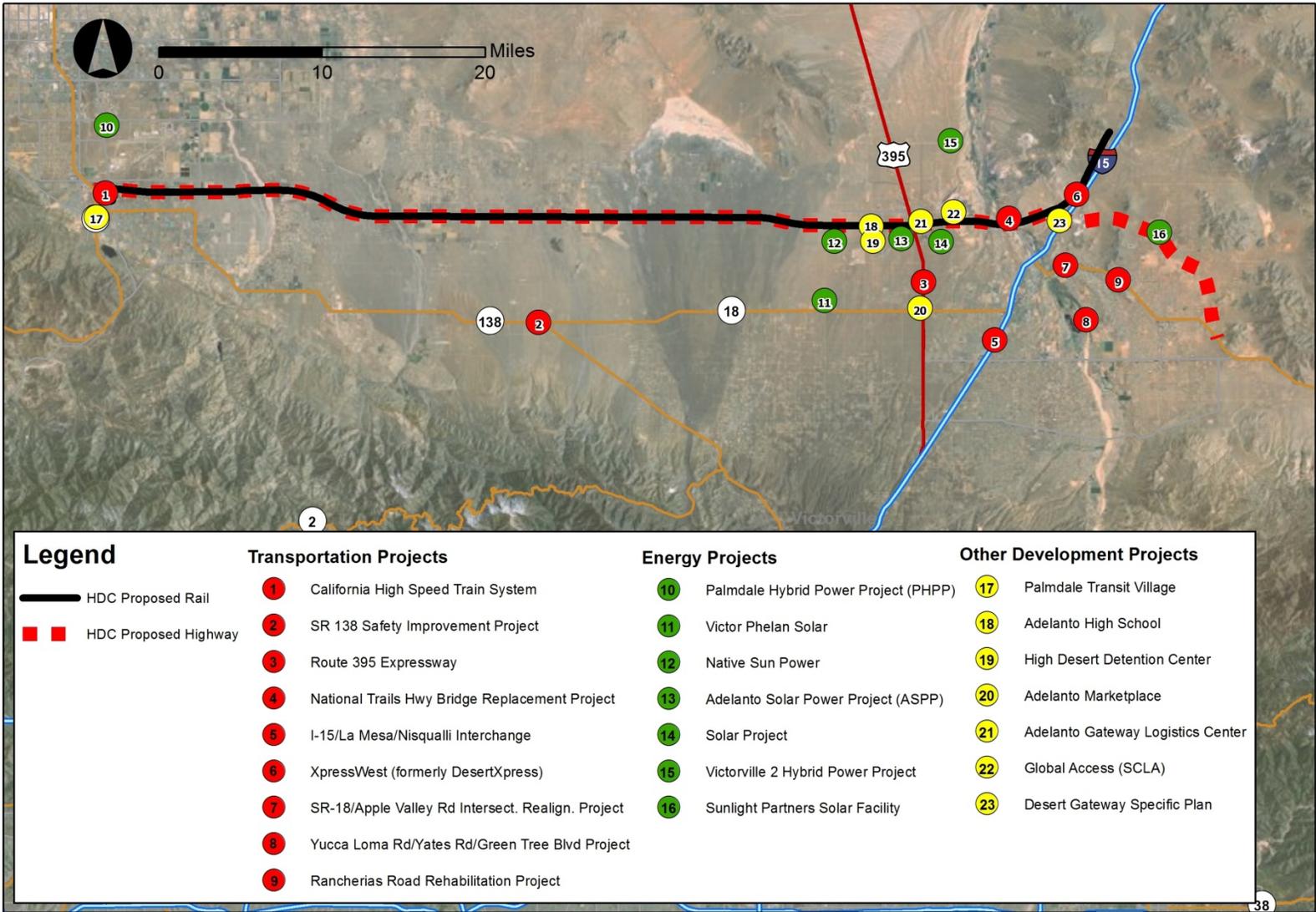
	Project Title	Project Description	Lead Agency	Project Status
11	Victor Phelan Solar	This project is an 18-MW generating solar facility on 160 acres. Located in Adelanto at the east corner of Seneca Road and Caughlin Road.	SCE	Project completed in 2013.
12	Native Sun Power	Native Sun Power has proposed a 4-MW photovoltaic (PV) plant on 35 acres near Rancho and Vinton roads, Adelanto. The plant aims to provide discounted electricity to nearby correctional facilities.	City of Adelanto	Project is in the planning phase.
13	Adelanto Solar Power Project (ASPP)	This solar PV project is located at Los Angeles Department of Water and Power's (LADWP) existing Adelanto Switching Station. The 10-MW utility-scale solar array is owned and operated by LADWP. It is located in Adelanto at Bellflower Street and Rancho Road.	LADWP	Project completed in 2012.
14	Solar Project	27-MW PV facility proposed for 205 acres of land at the southeast corner of Rancho and Emerald roads.	City of Adelanto	Project was approved in 2014.
15	Victorville 2 Hybrid Power Project	The project would consist of a hybrid natural gas-fired and solar thermal power plant in Victorville, San Bernardino County. Construction of the proposed Victorville 2 would require three areas that total 388 acres, located immediately north of the Southern California Logistics Airport (SCLA).	City of Victorville	Project is in the planning phase.
16	Sunlight Partners Solar Facility	This solar power facility is located in Apple Valley at the southeast corner of Navajo Road and Papago Road.	Town of Apple Valley	Project is in the planning phase.
Other Development Projects				
17	Palmdale Transit Village Specific Plan	Development of 156 apartment units and 122 townhomes. Located at the north side of Avenue Q and 4 th Street East, Palmdale.	City of Palmdale	Phase 1 is complete. Phase 2 is expected to be completed in 2014.
18	Adelanto High School	The project is Adelanto's first public high school. The 60-acre property is located on Mojave Drive between Raccoon Avenue and Joshua Road.	City of Adelanto	Project completed in 2014.
19	High Desert Detention Center (formerly Adelanto Detention Center)	Construction of a 2,200-bed correctional facility. Located at the northeast corner of Rancho Road and Raccoon Avenue.	City of Adelanto	Phase 1 constructed in 2014. Phases 2 and 3 are anticipated to be constructed by 2017.

Table 3.7-1 Cumulative Projects

	Project Title	Project Description	Lead Agency	Project Status
20	Adelanto Marketplace	Adelanto Marketplace is a multitenant retail center consisting of 27,489 square feet. Tenants include Stater Bros. Market, Starbucks, Rubio's, Denny's, and Bank of America.	City of Adelanto	Project completed in 2013.
21	Adelanto Gateway Logistics Center	This 400-acre industrial project is located across from the SCLA at Air Expressway and Adelanto Road. The center will consist of 10 to 15 industrial buildings ranging from 0.5 to 1.5 million square feet each.	City of Adelanto	Project is in the planning phase.
22	Global Access (SCLA Development)	Under Phase 1, more than 2.8 million square feet will be constructed with 6.4 million square feet of industrial space (360 acres) planned in Phase 1. (SCLA – 43.5 million square feet, Southern California Logistics Centre – 65 million square feet, Southern California Rail Complex – 60 million square feet).	City of Victorville	Phases 1 and 2 completed. Phase 3 in planning phase.
23	Desert Gateway Specific Plan	The Desert Gateway Specific Plan represents a vision for a new 10,203-acre community in the High Desert with transit-oriented development principles central to its character. Desert Gateway would be located at the interchange of the proposed project and I-15. It is projected the plan will create 26,100 housing units for 82,900 residents. Land uses would include a mixture of residential, commercial, mixed-use, industrial, and open space.	City of Victorville	Specific Plan was approved in 2010.

Source: Cities of Palmdale, Adelanto, Victorville, Apple Valley 2014.

Figure 3.7-1 Cumulative Projects



Source: Data collected by Parsons, 2014.

Environmental Consequences

This section discusses potential impacts to various resources that could occur as a result of the HDC Project together with the other related projects listed in Table 3.7-1.

Cumulative transportation, energy, and other development projects identified above indicate that most development occurred, is planned, or is occurring within the Victor Valley area surrounding US 395. Rural communities within the project area have witnessed limited development and are not expected to significantly expand in the near future; however, the desert area is becoming an important location for furthering green energy strategies, as shown by the large number of solar projects located within 5 miles of the proposed project alignment. Other than transportation improvement projects, the predominant development within the High Desert region is solar energy.

There are almost as many solar energy projects in planning, construction, or completion phases as there are other types of development, including transportation within the study area. Most of these solar projects are located in or near Adelanto. By taking advantage of the sustainable, natural resource and vacant land in the area, these projects will be able to create a substantial offset of power usage in the area. Two of the projects in the area are already completed and beginning to offset electricity usage.

The two other major transportation projects proposed in the project area consist of the California High Speed Train (HST) System and XpressWest. Other transportation projects include the realignment and widening of US 395 and the Yucca Loma Road/Yates Road/Green Tree Boulevard Transportation Improvement (Yucca Loma) project, which will provide a new link between Victorville and Apple Valley over the Mojave River. Developments associated with the rail projects include rail stations in Palmdale and Victorville to connect the HST with the HDC in Palmdale, and the HDC with XpressWest in Victorville.

Other types of development projects geared toward transit-oriented development (TOD) consist of the Desert Gateway Specific Plan, which would be a mixed-use, high-density, new community associated with the future site of the new rail station in Victorville. Another TOD project proposed for the study area is the Palmdale Transit Village, which will create new multi-family residential opportunities at the west end of the proposed project. Commercial projects are proposed in Adelanto, and there is an addition proposed for the High Desert Detention Center in Adelanto, which will create more space for the prison. In addition, Adelanto's first public high school opened this year.

Located immediately adjacent to the proposed HDC, the City of Victorville and Stirling, a Foothill Ranch, California-based development company, have partnered to redevelop the former George Air Force Base (GAFB) into Global Access. Global Access in Victorville combines air, ground, and rail connections within a master-planned 8,500-acre multimodal freight transportation hub. Global Access is comprised of the SCLA, Southern California Logistics Centre, and Southern California Rail Complex. The airport and logistics centre are constructed, while the rail complex is still in the planning phase.

According to the Southern California Association of Governments (SCAG), the greater Antelope Valley and Victorville areas have grown significantly in the last 20 years and are projected to continue to grow in the future, despite the economic slowdown since 2008. Implementation of the proposed project would accommodate long-range development proposed in the project vicinity by improving traffic circulation and relieving anticipated future traffic congestion.

If multiple projects are built during the same general time frame, it would likely result in increased localized construction-related traffic congestion and construction air emissions and noise impacts. The Route 395 Expressway Project, XpressWest, the HST, and development associated with the rail stations in Palmdale and Victorville are examples of other actions that would occur immediately adjacent to the HDC and have the potential to contribute to cumulative construction impacts if they are constructed within the same time frame. Caltrans would work together with other lead agencies to ensure overlapping construction from multiple projects in the same vicinity would be managed to avoid or lessen cumulative impacts.

Timing of the HST and XpressWest, which would connect to the HDC Project at the west and east ends, respectively, is uncertain at this time. If the HST and XpressWest projects were to be in construction at the same time as the HDC, there would be cumulative impacts for construction air quality, noise, and traffic. Both projects would generate these types of impacts and, because the construction areas overlap, the surrounding areas would experience the impacts of the projects at the same time.

The analysis concludes that there may be cumulative impacts for several resources:

- Community Resources, including land use, parks and recreation, growth, farmland/grazing land, community character and cohesion, relocation and property acquisition, and environmental justice
- Utilities/Emergency Services
- Traffic and Transportation/Pedestrian and Bicycle Facilities
- Visual/Aesthetics
- Cultural Resources
- Water Quality and Stormwater Runoff
- Geology/Soils/Seismic/Topography
- Paleontology
- Hazardous Waste or Materials
- Air Quality
- Noise
- Biological Resources

Hydrology and floodplain is not considered in the cumulative impact analysis because any impacts would be fully mitigated with implementation of stormwater best management practices (BMPs).

Analysis of cumulative impacts for these resources is presented below. The affected environment for each of these resources has been previously discussed in its respective portion of Chapter 3. Analysis focuses on the cumulative impacts of the build alternatives.

Community Resources

As stated above, the community resources analysis includes the following topic areas: land use, parks and recreation, growth, farmland/grazing land, community character and cohesion, relocation and property acquisition, and environmental justice.

Resource Study Area

The HDC Project is located in the Antelope and Victor valleys of Los Angeles and San Bernardino counties. The HDC would pass through larger and smaller cities and rural communities between Palmdale and Apple Valley. The effects to land use were considered by evaluating consistency with policy plans and identifying the property acquisitions that would be required as a result of the proposed project.

Jurisdictions covered in the analysis include the City of Palmdale, City of Adelanto, City of Victorville, Town of Apple Valley, and communities within unincorporated areas within Los Angeles and San Bernardino counties.

Current Condition and Historical Context

The HDC study area is largely rural and undeveloped with larger cities flanking the endpoints of the proposed project corridor. Existing land uses throughout the project corridor consist of a mix of uses from agricultural to industrial to residential to resource conservation areas. The Mojave River, a major natural resource, flows between Adelanto and Victorville within the study area.

In its existing condition, there is no direct route between Palmdale and Victorville and Apple Valley. The HDC would improve mobility in the area and create more opportunities for development along the proposed corridor.

Project Impacts

Land Use

Construction of the HDC Project would result in conversion of a varied mix of existing land uses, including farmland, industrial, commercial, resource conservation, airport, and residential. The proposed freeway would provide greater access to existing areas, which may provide economic benefits for those particular industries. The increased accessibility created by the HDC would allow existing land uses located adjacent to the proposed interchange locations within Victorville and Palmdale to shift towards greater commercial and industrial use. The existing rural character within the unincorporated areas would likely be maintained in unincorporated Los Angeles County, as businesses would be drawn to the existing business activity in the urban areas.

Parks and Recreation

Construction of the proposed HDC alignment, except for Variation E, would require minor acquisition of Westwinds Golf Course, but no substantial impact was determined. In addition, indirect impacts to Rockfield Nature Park in Victorville may result from the acquisition of right-of-way (ROW) for the HDC alignment, in which a segment of the Los Angeles Department of Water and Power (LADWP) parking lot that serves the park may be acquired as part of the project. No impact would occur to the park use feature since the project would replace the parking area for LADWP.

Growth

The HDC Project would tend to shift some future development toward the new interchanges in Palmdale and Victorville/Adelanto. The alternatives with HSR would tend to change current low-density development patterns to higher density and mixed uses near the proposed rail stations in Palmdale and Victorville. The tolled alternatives would tend to spread some residential development along the toll-free highway network, but they would still attract commercial and industrial development near the interchanges in the eastern and western ends of the project. Conversely, the HDC is not expected to shift development to the proposed interchanges to be located in the undeveloped areas in the central and somewhat isolated rural region of the corridor, largely due to the lack of utilities, market demand, and supportive public land use policies.

Farmland/Grazing Land

The HDC would directly affect farmland by converting approximately 252 acres of Important Farmland and approximately 2,965 acres of Grazing Land to nonagricultural use, which could be a substantial impact. Alternatives that include rail would affect an additional 650 acres of sheep grazing land. The farmland and grazing lands would be acquired for the new transportation facility ROW.

Community Character and Cohesion

The proposed project may include changes to existing access and circulation, increased urbanization, growth, and quality of life. Proposed community enhancements as a result of the project include construction of a bike path/lane adjacent to the HDC, which would provide the community with additional mobility options and promote community character by improving connectivity within communities.

Relocation and Property Acquisition

Implementation of any of the build alternatives would result in property acquisitions, with differences identified for the highway-only alternatives and highway and rail alternatives. Depending on the highway alternative/variation that is selected, there could be up to 95 residential units and 68 nonresidential properties that may be acquired. For the rail alternatives, there could be up to 49 residential units and up to 53 nonresidential units that may be acquired depending on the alternative/variation that is chosen. Further, if Option 1 is chosen, there would be 17 additional nonresidential acquisitions; and if Option 7 is selected, there would be 18 additional residential acquisitions and 14 additional nonresidential acquisitions. Most of the

residential acquisitions would occur in Victorville and Apple Valley, while most of the nonresidential acquisitions would be in Palmdale.

Environmental Justice

Implementation of the build alternatives would not cause disproportionately adverse effects on any minority or low-income populations; however, for the alternatives that include the tollway, toll pricing may be considered a deterrent for lower income populations to use the tollway. These issues need to be considered when determining toll prices.

Reasonable Foreseeable Actions

Increased mobility in the High Desert region would lead to changes in land use and an increase in development projects in the area. Planned roadway and infrastructure projects would also change existing land uses as a more developed roadway system is built. Roadway and infrastructure projects that require ROW acquisition could also lead to potential demolition and displacement. TOD proposed for the Palmdale Transit Village Specific Plan and the Desert Gateway Specific Plan projects would also create changes to land use and circulation patterns in the study area. The Yucca Loma Project would require 26 partial or full property acquisitions, as well as partial acquisition of the Mojave Narrows Park; however, the improved access would be considered a beneficial impact.

Cumulative Impacts

Land Use

Cumulative projects and planned growth in the High Desert region would lead to changes in land use and an increase in development intensity in the area. With this growth, there would be pressure for urbanized areas to expand to vacant lands and agricultural lands next to existing urban development. Historically, this has happened in San Bernardino County, in particular, but future development would be managed to be consistent with adopted General Plans, which encourage development in the urbanized portions of the city.

The proposed project would provide support to the existing and planned developments in the study area. All of the relevant projects planned for the project area are consistent with land use policies; thus, no cumulative impacts to resources are anticipated. Therefore, the project would not cumulatively contribute to considerable cumulative land use impacts.

Parks and Recreation

A review of cumulative projects indicates that planned projects that are mainly related to transportation would not result in new demand for recreational services but would instead facilitate access to recreational facilities. Mixed-use projects identified in the cumulative projects list would create additional demand for recreational services. As required by the Quimby Act, future land development projects would be required to provide additional parkland based on the population generated by the project. Implementation of the project would affect some parkland, but mitigation would be

provided to mitigate the impacts; therefore, the project would not contribute to cumulative effects on parkland.

Growth

Cumulatively, it is anticipated that the planned HST, extending from northern California to Los Angeles via the Palmdale Transportation Center, would have a transformational effect on growth. The HST would greatly improve access to the High Desert region and decrease travel times into the Los Angeles Basin and beyond. With superior accessibility and considering lower housing prices compared with the Los Angeles Basin, HST should attract new residents to the Palmdale/Lancaster metropolitan area because commutes to jobs in the Los Angeles Basin and San Fernando Valley would be much quicker than under present conditions. Moreover, this increased accessibility and substantial investment in public transportation infrastructure, coupled with lower land costs and increased market demand, would be expected to also attract new commercial, industrial, and other employment opportunities within the High Desert region, thus helping address the current housing/jobs imbalance. Also from a cumulative perspective, the rail alternatives for the HDC Project would facilitate connections into Palmdale for passengers on XpressWest, a privately proposed HSR project between Las Vegas and Victorville. This would add to the transformational effect on development. Given these considerations, the cumulative impacts of new growth in the High Desert region would be considerable, much more than the HDC Project alone.

Another beneficial cumulative impact of the proposed project together with the other cumulative projects is job creation. Cumulative construction jobs could create economic benefits for the communities and jurisdictions in which the construction occurs. The XpressWest project would bring up to 463 permanent positions with implementation of the project.

The rail service would make it possible to work in the higher paying Los Angeles Basin and live in the less expensive HDC region with an easy commute; however, this transformation may eventually lead, among other things, to more environmental benefits. The principles of TOD could initiate a more compact form of mixed-use, pedestrian-oriented development that does not currently exist in the High Desert region. The proposed project, combined with other related projects, would contribute to cumulative effects on growth.

Farmland/Grazing land

According to the San Bernardino County General Plan EIR, San Bernardino County ranks in the top 15 agricultural-producing counties in California; however, agricultural use within the county continues to decline with urban expansion. As mentioned in the land use section, when urban expansion encroaches into agricultural areas, remaining agricultural lands become surrounded by urban uses, further exacerbating the conversion of farmland to nonagricultural use. The decreasing air quality, increasing water costs, and decreasing viability also contribute to the conversion of farmland to other uses.

The proposed project, in combination with the transportation improvements around the east end of the project, the implementation of the Desert Gateway Specific Plan, the HST project, and the solar energy projects, as well as other projects and development in San Bernardino County, would continue the regional trend of converting farmland to nonagricultural uses. Indirect cumulative farmland impacts could occur due to improved access and desirability of land adjacent to the HDC alignment and interchanges and its subsequent impacts to open space and natural resources and infrastructures. Due to improved access, farmland could be under pressure for conversion to a higher-value residential and commercial land use. Smaller-size farmland properties are at higher risk of conversion because they are more affordable to purchase and may require an easier process for obtaining environmental clearances and permits. The Desert Gateway Specific Plan would also encourage development surrounding the proposed Victorville rail station, which could further affect agricultural resources in the area.

Based on SCAG's adopted 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), future growth is anticipated and planned to be sustainable and context-sensitive (i.e., directed toward protecting open space and agricultural resources).

The proposed project would have a considerable contribution to cumulative impacts related to farmland.

Relocation and Property Acquisition

Implementation of any of the alternatives would result in property acquisitions. Cumulative impacts may result from the replacement properties that would need to be acquired for various projects located within the cumulative impact study area.

Compliance with the California Relocation Assistance Act, the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act, regarding fair compensation and relocation assistance for displaced individuals and businesses would minimize cumulative impacts as a result of ROW acquisition, but, combined, these projects would add to the demand for residential units and business properties in the High Desert region. The timing of the property acquisition process would be important in phasing the impact on replacement housing.

ROW acquisition required for the HDC Project would slightly diminish the property tax base of the project area, resulting in minor losses of property tax revenue. Several public projects listed above would also result in the acquisition of private property, further diminishing the local property tax base. Taken altogether, however, this potential cumulative impact would likely be offset by the ongoing and expanding residential, industrial, and commercial property development identified in the cumulative projects list.

Potential cumulative impacts associated with the proposed project, however, would likely be offset by the ongoing and expanding development identified in the cumulative projects list.

Utilities/Emergency Services

Resource Study Area

Potential impacts to public utilities and services were determined by inventorying those facilities that were within 0.5 mile of the HDC.

Current Condition and Historical Context

Public utilities analyzed for the HDC Project include electrical power, natural gas, telephone service, cable television services, and communication services. Emergency services include medical facilities, fire, and police stations.

Project Impacts

Public and Private Utilities

It is estimated that the proposed project would have an impact on utilities at approximately 300 locations for the highway alternatives and 500 locations for the alternatives with the HSR component within the different communities within the alignment.

Emergency Services

The proposed project would not result in direct impacts to medical facilities, fire, or police stations. It is likely the proposed project may improve response times for emergency services to other areas that do not currently have direct access to a major travel route, which would reduce congestion on existing local roadways. The project could create the need for additional personnel and equipment in the areas of California Highway Patrol (CHP) and possibly emergency services. This need would be mitigated by the fact that the project would increase the economic vitality of the region, and it is anticipated to improve the overall local and regional fiscal conditions.

Reasonable Foreseeable Actions

Reasonable foreseeable actions include construction of additional residential uses as part of the mixed-use developments. Specific Plans mentioned above and facilities associated with transportation development would result in an increase in demand for utility and emergency services.

Cumulative Impacts

Public and Private Utilities

The proposed project, in combination with the related projects, would place additional demand on the existing public utilities and emergency service providers. Projects in the cumulative study area collectively could result in adverse impacts to utilities related to increased demand for facilities, requiring new or expansion of facilities and/or the need to relocate or modify to accommodate proposed development. Buildout of the land uses assumed in development could require the upgrade/expansion of existing utilities to accommodate anticipated demand on the utility grid. Where feasible, appropriate minimization measures have been identified to reduce individual project impacts to utilities. These may include relocation or upgrading of facilities or payment of in-lieu fees.

The build alternatives would require utility relocation during construction; however, because the cumulative projects are not anticipated to adversely affect utilities, the impacts to utilities are not anticipated to contribute to a cumulative impact. Utility disruption due to highway construction would be minimized with the development of and implementation of a Utility Relocation Plan for the HDC alignment; therefore, the project's contribution to cumulative effects to utilities would not be adverse.

Emergency Services

Intensification of land uses associated with other related projects could result in the increased demand for emergency services and may affect response times. At the same time, the increased accessibility may also increase response times for fire and emergency service vehicles.

The build alternatives would involve construction that would contribute to short-term cumulative effects to emergency services in delayed response times. This could occur with the closure of some north-south streets but would be offset by construction of either new overcrossings and or undercrossings. The effect would also be minimized by implementation of a Traffic Management Plan (TMP) that would contain detailed plans of access routes and detours during construction. Because the cumulative projects are not anticipated to adversely affect emergency services, the impacts due to the proposed project are not anticipated to be cumulatively substantial.

Intensification of land uses indentified in the cumulative projects would serve to provide additional funds to increase law enforcement officers or facilities, offsetting the cost of any increased demand.

All of the build alternatives would require some level of demolition to accommodate the proposed HDC; therefore, all of the alternatives would create demolition and construction debris. These short-term impacts could potentially be adverse when considered with the waste disposal needs of the other cumulative projects in the area. Recycling of material either onsite or offsite would minimize the impacts of the build alternatives; however, these alternatives would not result in long-term cumulative impacts on solid waste disposal because it is a transportation facility and would result in only a minor increase in collection of roadside debris.

The projects in the study area would potentially increase solid waste demand due to intensification of land uses and could incrementally reduce capacity within the County of Los Angeles sanitary landfills. Application of State-mandated recycling requirements for construction and operational activities would reduce the total increase and minimize solid waste.

Several projects, including Desert Gateway and XpressWest, would create additional demand on water supply and emergency resources. Because the proposed project would also create substantial demand for additional emergency response personnel, the cumulative impact could be considerable.

Traffic and Transportation/Pedestrian and Bicycle Facilities

Resource Study Area

The traffic analysis study area runs west to east along the proposed corridor from SR-14 in Palmdale on the west to east of Joshua Road in Apple Valley on the east, for a total length of 64 miles. In the north-south direction on the west end, the study area covers the area from the intersection of I-15 and Dale Evans Parkway on the north to Bear Valley Road on the south. On the east side, the study area covers the area from the intersection of SR-14 and West Avenue N on the north to the intersection of SR-14 and East Avenue S on the south.

Current Condition and Historical Context

The High Desert portion of the corridor is currently served by a sparse network of county and local roads that are typically two lanes. Sporadic, short sections of roadway have been widened along frontages of newer land developments as a condition of approval. Few of these roadways are continuous throughout the High Desert region. East Palmdale Boulevard is one of the longest east-west roadways, extending from Palmdale to 240th Street East; continuing east as El Mirage Road/East Avenue P. Sheep Creek Road is one of the longest north-south roadways, extending from SR-138 in Phelan to just north of El Mirage Road.

Project Impacts

The project would have a beneficial impact on long-term traffic and transportation operations in the corridor by accommodating future population growth, relieving future congestion, and improving safety. All of the project alternatives include access improvements and new interchanges. In addition, two of the project alternatives include providing passenger rail service, with rail stations located in Palmdale and Victorville.

The proposed project would affect local circulation by causing several street closures and loss of direct connectivity on both sides of the proposed facility. Bus service would not be affected by construction of the project.

In addition, the project is planned to support a variety of transportation facilities as part of the local jurisdictions plans. Additional parking facilities would be provided as part of the railroad stations to meet the need created by the expansion of train service, along with other facilities to accommodate nonmotorized transportation.

Reasonable Foreseeable Actions

Reasonable foreseeable actions, including construction of the projects listed above, would provide improved access, as well as create traffic congestion in the study area. The Yucca Loma Project, Desert Gateway Specific Plan, HST, XpressWest, US 395 Widening, and the Palmdale Transit Village would create substantial traffic impacts during project construction. At the same time, beneficial impacts would result from these projects once they are completed.

Cumulative Impacts

The various rail projects in the study area would create a beneficial cumulative impact on freeway volumes. With the various HSR opportunities, people would forgo using their cars and take public transportation.

Development could cumulatively combine to adversely affect intersection operations near the proposed rail stations. With the implementation of avoidance, minimization, and mitigation measures, it is not anticipated that the project would have negative impacts on access, circulation, parking, and public transit, and it would not contribute to cumulative project impacts.

Visual/Aesthetics

Resource Study Area

The entire project is located in the Mojave Desert of southern California. The existing visual context is characterized by low-density residential, rural desert, and commercial developments of various sizes spread throughout the area. The landscape is characterized by desert chaparral consisting of desert scrub, Joshua trees, and California junipers.

Current Condition and Historical Context

The land use within the corridor is primarily rural and suburban residential, but it also includes areas of commercial, industrial, recreational, open space, and agricultural land uses throughout. The High Desert region of the proposed project is primarily undeveloped, with long stretches of open landscapes. There are no scenic resources within the project area, and no portion of the project is within an officially designated scenic highway.

Project Impacts

This project would change the rural appearance of some of the communities through which it passes with the implementation of large, widened, urban, transportation infrastructure and concrete urban structures. The primary overall visual effect of the project, regardless of alternative, would be the increased urban character caused by the additional highway lanes, reduction of desert landscape, and, at some locations, the construction of soundwalls and structures that would block views. The inherent visual change associated with an increase in visual scale and additional hardscape would be unavoidable and noticeable.

In addition, several additional components of the project are proposed, including infiltration basins, solar facilities, HSR stations, traction power substation, and radio tower sites, which would change the visual landscape of the project area. Because of their large size, strong regular geometry, and highly reflective surfaces, solar energy facilities may contrast strongly with the natural or rural settings in which they are located.

Reasonable Foreseeable Actions

New structures and infrastructure would be introduced primarily by roadway projects, solar energy projects, and nonresidential developments that have been proposed in the study area. Future development in the study area would add to the increasing intensity

and density of urban development in the project area through construction of new buildings and infrastructure systems, including roadways.

Cumulative Impacts

Future development would expand the urbanized area, but the High Desert region would continue to be surrounded by agricultural land or low-density uses in the outlying areas, thereby maintaining a semirural character.

The solar energy projects discussed in this section would introduce utilitarian visual features, such as solar panels, buildings, wind turbines, and additional overhead transmission lines, into the existing visual environment and could cumulatively alter the visual environment of this largely undeveloped area. These related projects, in combination with the proposed project, could result in cumulative changes to the existing visual character. These projects could cumulatively introduce an industrial visual character to the nonurbanized visual landscape, but they would not result in a rapid change in visual character due to their dispersed locations throughout the desert.

The cumulative impact of the HDC Project and the Global Access multimodal project would change the visual character of the area around northwest Victorville from semiurban to more urban. Motorists and residential viewers would be affected by this change. The cumulative change would be slightly adverse.

Additionally, development within the Desert Gateway Specific Plan area, XpressWest, HST, and the proposed project facilities would cumulatively affect the existing lighting and glare, particularly in the areas within limited development along the project corridor.

While cumulative effects would introduce new urban visual features into the open, expansive undeveloped desert, as well as changes to urban areas, cumulative visual effects would be isolated to the viewshed in the related projects' sites. The proposed project, in combination with the past, present, and future projects within the area of cumulative analysis would have the potential to create a cumulative impact to visual resources.

Cultural Resources

Resource Study Area

The Resource Study Area includes all cultural resources located within the designated Area of Potential Effect (APE). In Palmdale, the APE parallels Avenue P-8 for a distance of approximately 10 miles to 100th Street East. From 100th Street East, the APE curves south and continues east parallel to East Palmdale Boulevard. In San Bernardino County, the APE parallels Air Expressway Boulevard and then crosses the Mojave River and I-15 and enters Apple Valley. In Apple Valley, near Corwin Road, the APE turns south and terminates at SR-18. The vertical limits of the APE would vary depending on location along the ROW. In most areas of the APE, grading to prepare the APE for fill and paving would be limited to 5 to 10 feet below the existing ground surface.

Current Condition and Historical Context

Based on ethnographic research conducted for the project, the study area was traditionally occupied by the Kawaiisu and Vanyume/Serrano peoples. The built environment within the APE reflects the historical evolution of the desert area of northern Los Angeles and San Bernardino counties. Postwar tract-style houses located on subdivided lots are the predominant building type identified within the project alternative study areas. Commercial buildings are also a dominant building type within the APE. Several linear resources, including former roads and trails, transmission lines, and railroads are also located within the project area.

For the portion of the project alternatives lying within Los Angeles County, record searches revealed 106 cultural resource surveys have been conducted within a 1-mile radius of the project APE. In total, 33 cultural resources were previously recorded within 1 mile of the APE, including 23 historical archaeological sites, 1 historical structure, and 9 prehistoric isolates. No Points of Historical Interest, California Historical Landmarks, California Register of Historical Resources (CRHR), National Register of Historic Places (NRHP) listed, or Historic Resources Inventory listings were identified within a 1-mile radius of the project APE portion located within in Los Angeles County.

For the portion of the project area that lies within San Bernardino County, record searches revealed that 174 cultural resource surveys have been conducted within a 1-mile radius of the project APE. In total, 213 resources were identified within a 1-mile radius of the project APE, with 37 within the APE. There are 9 NRHP-eligible properties and three California Historic Landmark listings located within a 1-mile radius of the project APE portion located within San Bernardino County.

Project Impacts

All HDC build alternatives would result in a finding of an Adverse Effect in accordance with the Section 106 Programmatic Agreement (PA). Effects to cultural resources would apply equally to all of the build alternatives. An Adverse Effect finding as a result of the project alternatives was found for one historic property – prehistoric archaeological site CA-SBR-12336.

All of the HDC build alternatives have the following five NRHP-eligible properties (linear resources) within their immediate or adjacent footprint, and the impacts would be similar for all. National Old Trails Highway; Atchison, Topeka and Santa Fe (ATSF) Railroad; Boulder Dam Transmission Lines 1, 2, and 3, and Towers (BDTL), the Edison Company Boulder Dam-San Bernardino 115-kilovolt (kV) Transmission Line (BDSBL), SCE Kramer-Victorville Power Lines and Towers, and an NRHP-eligible prehistoric archaeological site.

Reasonable Foreseeable Actions

New development proposed in the High Desert region, along with several transportation projects planned throughout the area, may have the further effect of

reducing certain historic properties from the existing inventory. XpressWest would affect archaeological resources in the study area.

Cumulative Impacts

Construction activities may cause the loss or impairment of cultural resources in the study area. These include demolition or relocation, as well as increases in vibration and the introduction of new visual elements out of character with the setting of the historic property. Development and other changes induced over time may eliminate or reduce the number of certain types of built environment properties and archaeological resources that represent the High Desert region's cultural history.

For cumulative impacts to occur to archaeological resources, important examples of these resources would have to be permanently removed from the existing inventory of the study area. XpressWest, combined with the proposed project, would not permanently remove the existing inventory in the study area; therefore, cumulative impacts related to archaeological resources are not expected to be substantial.

The related projects would likely be required to incorporate similar types of mitigation measures prior to development. With these mitigation measures, cumulative impacts to cultural resources would not likely be substantial.

Water Quality and Stormwater Runoff

Resource Study Area

The geographic context for the analysis of cumulative impacts associated with water quality is the area covered by the Antelope Valley and Mojave River watersheds, and the geographic context for the analysis of cumulative impacts associated with groundwater is the area underlain by the Antelope Valley Groundwater Basin and the Mojave River Groundwater Basin.

Current Condition and Historical Context

The project corridor traverses two watersheds – Antelope Valley and Mojave River. The hydrologic regime along the entire corridor exhibits the characteristics of an alluvial fan, with several channels that cross the project alignment. The project area has a High Desert-type climate, characterized by long, dry, hot summers and cold and windy winters. In the Antelope River and Mojave River valleys, the summer months are hot with little or no precipitation, and all areas within this region can be affected by summer monsoonal thunderstorms. Precipitation occurs as rainfall, with snow common in the high mountains.

Historically, groundwater flowed north from the San Gabriel Mountains and south and east from the Tehachapi Mountains toward Rosamond Lake, Rogers Lake, and Buckhorn Lake. Groundwater pumping has caused subsidence of the ground surface, as well as earth fissures to appear in Lancaster and on Edwards Air Force Base. By 1992, 292 square miles of Antelope Valley had subsided by more than 1 foot. This subsidence has permanently reduced aquifer system storage by about 50,000 acre-feet.

Groundwater is recharged into the basin predominantly by infiltration of water from the Mojave River, which accounts for approximately 80 percent of the total basin natural recharge. Other recharge sources include infiltration of storm runoff from the mountains and recharge from human activities such as irrigation return flows, wastewater discharge, and enhanced recharge with imported water.

Project Impacts

The proposed project would result in an increase in impervious surface areas, which could potentially increase stormwater runoff. This could potentially modify the natural timing of drainage in the watershed through changes in the time required for runoff to reach local streams and changes in peak runoff rates and runoff volumes. Once the new facility is completed, potential pollutant sources would be associated with motor vehicle operations, highway maintenance activities, illegal dumping, accidental spills, and landscaping care.

Reasonable Foreseeable Actions

Development of the HDC Project, in combination with all other development that would occur in the watershed areas, would involve construction activities, increases in stormwater runoff from new impervious surface area, and possibly reduction in groundwater recharge areas. Construction of new development throughout the watershed areas could result in the erosion of soil, thereby cumulatively degrading water quality. In addition, the increase in impervious surface area resulting from future development may also adversely affect water quality by increasing the amount of stormwater runoff, transportation-related pollutants, and associated targeted design constituents (TDCs) entering the storm drain system. New development, however, would have to comply with existing regulations regarding construction practices that minimize risks of erosion and runoff.

Cumulative Impacts

The increase in impervious surface could cumulatively contribute to stormwater runoff, primarily near the proposed rail stations and Specific Plan areas in Palmdale and Victorville. Compliance with applicable regulatory requirements identified in Section 3.2.2, Water Quality and Stormwater Runoff, which require implementation of BMPs during the construction and post-construction phases, would ensure that water quality is maintained to the maximum extent practicable for potential development projects within the watershed areas. Therefore, water quality impacts associated with implementation of the HDC Project and the proposed projects would be minimized and would not have a cumulatively considerable contribution to the cumulative effects related to water quality.

Intensification of development and addition of impervious surfaces as a result of implementation of the transportation, energy, and other development projects, as well as the HDC Project, would not have a cumulatively considerable contribution to the adverse effects on groundwater recharge in the basins. Although the overall development associated with all of the projects that may be planned within the basins could directly and/or indirectly result in the loss of groundwater volume and recharge

areas, this loss would be mitigated by groundwater recharge programs that have already been designed and implemented within the two basins to ensure that groundwater will continue to be a viable water supply in the future. In addition, all of the projects would be required to comply with the post-construction standards referenced in the Construction General Permit (Order No. 2009-0009-DWQ), which requires the use of structural treatment practices (i.e., Treatment BMPs) to capture stormwater runoff. These structural treatment practices must be approved by the Regional Water Quality Control Board to ensure that they are implemented to the maximum extent practicable. Structural Treatment BMPs, such as infiltration devices, augment groundwater by retaining stormwater runoff, which subsequently infiltrates into the groundwater regime; therefore, new development, as well as the proposed project, would not have a cumulatively considerable contribution to the cumulative effects related to groundwater recharge.

Geology/Soils/Seismic/Topography

Resource Study Area

The study area for the geology/soils/seismic/topography impacts is the maximum footprint of all of the build alternatives.

Current Condition and Historical Context

The proposed project, located within the High Desert region, is within the geologic region of California known as the Mojave Desert Geomorphic Province. This geologic region consists of unique defining features based on geology, faults, topographic relief, and climate. The Mojave Desert is bounded on the southwest by the San Andreas Fault Zone and Transverse Ranges, which includes the San Gabriel Mountains on the south; on the north and northwest by the Garlock Fault and Tehachapi and Sierra Nevada mountains; and to the east by the Sonoran Desert region. The Mojave Desert is characterized by desert alluvial fans with internal drainages, alluvial valley plains, and lacustrine basins (located north of the alignments).

Project Impacts

Impacts related to erosion occurring during construction and after completion of the project that may affect the traveling public or the project facilities would be reduced through project design, including the use of appropriate grading techniques.

The proposed project alignment is not located within an Alquist-Priolo Earthquake Fault Zone and is not located over a previous well-defined fault trace. The potential for impacts from geologic and seismic hazards to the components under each build alternative is considered low. In addition, the potential of exposure of construction workers and the traveling public, once the HDC is operational, to these hazards is considered low.

As a beneficial impact, the HDC may facilitate the movement of economic mineral resources (i.e., aggregate base, sand, and gravel) from the area. It may also facilitate the development of more sand and gravel quarries.

Reasonable Foreseeable Actions

Development of the HDC Project, in combination with all other development that would occur in the study area, would involve construction activities that would create additional geologic impacts. New development, however, would have to comply with existing regulations regarding construction practices that minimize ground shaking, liquefaction and other soils, seismic, and topographical constraints.

Cumulative Impacts

Ground shaking, liquefaction and other soils, seismic, and topographical constraints pose a potential hazard for all development projects in southern California; however, these effects are evaluated on a site-specific basis, and potential impacts are minimized via site-specific design features. Measures, such as adherence to geotechnical consultant recommendations regarding soil preparation, earthquake structure design, and grading methods, would minimize potential effects for each project; therefore, they do not result in substantial cumulative effects.

Paleontology

Resource Study Area

The paleontological study area includes all locations that would be subjected to subsurface ground disturbance under all of the alternatives of the proposed project. The paleontological study area is the same as the project construction area.

Current Condition and Historical Context

Four geologic units in the project area have been classified as having high potential to contain scientifically significant paleontological resources. These units are: Holocene to Pleistocene low terraces, alluvial fans, and colluvial aprons of fine to medium sand (Q6m); Holocene to Pleistocene low terraces, alluvial fans, and colluvial aprons of pebble gravel with a sand and silt matrix or very coarse to coarse sand with gravel (Q6c); Pleistocene high-terrace deposits and alluvial fans of pebble gravel with a sand and silt matrix or very coarse to coarse sand with gravel (Q3c); and Pleistocene intermediate terraces, alluvial fans, and Pleistocene colluvial aprons of pebble gravel with a sand and silt matrix or very coarse to coarse sand with gravel (Q4c).

Project Impacts

The proposed project could affect Holocene to Pleistocene and Pleistocene deposits. Construction would include excavation and grading during proposed roadway improvements. Most of the construction limits in the project area remains largely undeveloped. The potential to find undisturbed, native surficial deposits would be greatest in these undisturbed areas. Ground disturbance from proposed construction of supporting facilities, including temporary construction offices and construction staging areas, could also disturb native materials, with some potential for impacts on paleontological resources.

Reasonable Foreseeable Actions

Reasonable foreseeable actions include excavation and grading during proposed roadway improvements. The increased construction, particularly on undeveloped land, may result in the excavation of unknown paleontological resources.

Cumulative Impacts

Cumulative impacts to paleontological resources can occur when development of an area results in the removal of paleontological resources, which could degrade the physical historical record of an area. While impacts associated with such resources tend to be limited to individual project sites and do not generally result in substantial cumulative impacts, the proposed project, in combination with the related projects, could result in cumulative impacts to such resources. For example, the capacity improvements to US 395 or the rail improvements associated with the HST and XpressWest projects would have the potential to cumulatively affect the same paleontological resources that would be affected by the proposed project alternative where the rail alignment is located within the same vicinity. The Desert Gateway Specific Plan could also cumulatively affect the same resources as the proposed project in the immediate vicinity. However, minimization and mitigation measures provided would reduce any impacts to paleontological resources. The proposed project is not anticipated to have a considerable contribution to the cumulative effects to paleontological resources.

Hazardous Waste or Materials

Resource Study Area

Due to the length and scope of this project, the corridor was broken down into sections and segments.

Current Condition and Historical Context

The HDC study area is largely rural and undeveloped with larger cities flanking the endpoints of the proposed project corridor. Existing land uses throughout the proposed project corridor consist of a mix of uses from agricultural to industrial to residential to resource conservation areas.

Project Impacts

Construction of the HDC Project has the potential to expose construction personnel to asbestos-containing material (ACM) and lead-based paint (LBP) if these materials are not removed prior to construction. Workers and the general public may be exposed to aurally deposited lead (ADL) during construction and operation of the HDC in the San Bernardino County portion of the project area. The potential for exposure of construction personnel to hydrocarbons, methane, and hydrogen sulfide is likely during deep excavation or boring for bridge columns on the two plugged and abandoned oil well sites located in the project area. The groundwater gradient beneath the site is estimated to follow the gradient of the existing topography (i.e., south-southeast); therefore, any potential contaminant sources from the north and northwest directions of the site may have potential to affect the site. The former Meadowbrook Dairy Farm

at the northwest corner of the Sheep Creek Road/Parkdale Road intersection and Krey Field (Variation B) may have aboveground and/or underground storage tanks, although a search of GeoTracker did not yield any results for these sites.

Reasonable Foreseeable Actions

Reasonable foreseeable actions include construction activities that would increase the hazardous materials in the study area from demolition and other construction activities. Other actions include discovery of unidentified underground storage tanks and other hazardous materials.

Cumulative Impacts

For hazardous materials and waste, the concern would not be from contamination caused by the project, but rather from materials that are currently present in the environment, and hazardous materials transported on the areawide roadway system on a daily basis. Federal, state, and local management and disposal requirements address the handling of these materials. There would be an incremental increase in the generation of hazardous materials in the study area during construction; however, long-term operational impacts of the HDC would not contribute to the generation of hazardous materials.

Project impacts related to hazardous wastes and materials would be mitigated by implementing the mitigation measures provided. It is reasonable to assume that similar mitigation measures would be implemented as part of the related projects to alleviate potential adverse effects related to hazardous materials. Each individual project would be required to investigate and report any findings of contaminated soil or groundwater; therefore, it is not anticipated that there would be any cumulative impact related to hazardous waste or materials.

Air Quality

Resource Study Area

The project site is located in the Mojave Desert Air Basin (MDAB) within the jurisdictional boundaries of the Antelope Valley Air Quality Management District (AVAQMD) and Mojave Desert Air Quality Management District (MDAQMD). The MDAB is comprised of four air districts; the Kern County Air Pollution Control District (APCD), the AVAQMD, the MDAQMD, and the eastern portion of the South Coast Air Quality Management District (SCAQMD). The AVAQMD covers the western portion of the proposed project in Los Angeles County, while the MDAQMD covers the eastern portion of the proposed project in San Bernardino County. The MDAQMD's boundaries encompass San Bernardino County's High Desert and the Blythe portion of Riverside County.

Current Condition and Historical Context

The climate of the Antelope Valley is characterized by hot summers, mild winters, infrequent rainfall, moderate afternoon breezes, and generally fair weather. The most important weather pattern is associated with the daily onshore sea breeze, which funnels through Soledad Canyon into the upper desert to the north of the heavily

developed portions of the Los Angeles Basin. This daily air flow brings polluted air into the area late in the afternoon from late spring to early fall.

The primary Antelope Valley air quality concern is that there is a general transport of air from the polluted Los Angeles Basin through the Santa Clarita Valley, and then toward the normally cleaner upper desert, especially during the summer smog season. In addition to winds that control the rate and direction of pollution dispersal, southern California is notorious for strong temperature inversions that limit the vertical depth through which pollution can be mixed.

Project Impacts

Particulate matter less than 10 microns in diameter (PM₁₀)/particulate matter less than 2.5 microns in diameter (PM_{2.5}) hot spot analysis indicates results would be below federal standards but would be higher than the State's 24-hour PM₁₀ and annual PM_{2.5}. Future mobile source air toxic (MSAT) emissions in 2020 (opening year) and 2040 (horizon year) were calculated to compare the build condition against no-build condition and the build condition against existing condition. The results of the calculation show an increase from both the existing and no-build conditions along the proposed HDC; however, a decrease of MSAT levels in many areas outside the immediate vicinity along the proposed HDC was also exhibited.

Reasonable Foreseeable Actions

The Palmdale Transit Village project would exceed operational impacts of PM₁₀. XpressWest would potentially affect air quality.

Cumulative Impacts

The proposed project, in combination with past, present, and future projects in year 2040, is predicted to result in an increase in greenhouse gas (GHG) emissions, representing a cumulative impact. On a regional basis, the U.S. Environmental Protection Agency's (EPA) and California's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be significantly lower than today.

The proposed project would not substantially contribute to the cumulative impact because criteria pollutants and GHG emissions would decrease in association with the diversion of passenger vehicles. In addition, the project intended to incorporate the sustainable energy components into the project corridor, thus, offsetting the GHG emissions that would occur as a result of the project implementation.

Energy

Resource Study Area

Implementation of the proposed project would affect the use of energy resources in Los Angeles and San Bernardino counties. The analysis of these impacts is at the regional level.

Current Condition and Historical Context

Energy is currently consumed in the study area for construction of public and private projects; operation of motor vehicles; and to power a variety of existing land use functions. According to the California Energy Commission (CEC), the transportation sector represents the largest portion of California's energy consumption, as energy use continues to be dominated by growth in passenger vehicles. As such, consumption associated with vehicular movement is almost entirely fossil fuel (i.e., gasoline and diesel) based. California contains abundant sources of renewable and nonrenewable energy sources.

Project Impacts

Implementation of the HDC Project would affect the use of energy resources in Los Angeles and San Bernardino counties. The alternatives that incorporate rail would consume more energy than the highway alternatives. The vehicle miles traveled (VMT) would increase for each of the build alternatives compared to the No Build Alternative. These increases could be interpreted to indicate that the project would create trips, when in fact, it would primarily redistribute trips; however, this increase in VMT represents a worst-case scenario because the project would decrease travel times of delay by creating a shorter direct route with faster travel speeds.

The sustainability or green energy components of the HDC Project would result in an established, self-sustaining, energy-neutral corridor. Due to the energy requirements to become an energy-neutral corridor, a centralized solar array would need to be configured to provide the most amount of energy in an efficient manner. It has been determined that the most efficient configuration would involve a rectangular area adjacent to the HDC to power recharging stations for electric cars and overhead lighting. Excess energy could be returned to the local grid.

Reasonable Foreseeable Actions

Several projects identified on the related impacts list would create solar energy facilities within the High Desert region. There would be increased renewable energy sources created from these projects. Other development projects would also create additional energy demands for construction and operation.

Cumulative Impacts

Development projects, such as the Desert Gateway Specific Plan, would cumulatively contribute to energy consumption within the area of cumulative analysis. The allowable development would require the consumption of energy for development and operation of the proposed urban uses within the previously open, low-density area.

The HST and XpressWest projects would have similar energy effects as the proposed project because they are also HSR projects and would provide a mode shift from automobile and air travel, which would have the potential to have a net positive effect on energy consumption.

Conversely, the proposed solar energy projects could result in beneficial energy effects in California. These projects would use renewable energy resources to create power and electricity to serve California, reducing the need for new or expanded power plants that utilize nonrenewable sources (e.g., oil, gas, nuclear). Energy produced by these solar energy projects could potentially contribute to the electricity required by the proposed project, thus promoting the use of renewable resources and the reduction of petroleum dependence.

Because the proposed project would have a beneficial overall effect of reducing energy use over time, the proposed project would not have a considerable contribution to the cumulative energy effect.

Noise

Resource Study Area

The analysis evaluated the effects of noise on affected receivers next to the build alternatives. The entire area within the project limits was acoustically represented by 88 noise site locations. Traffic noise readings were taken at 68 locations and modeled at 20 sites.

Current Condition and Historical Context

The project study area consists of a mix of land uses, with the more urbanized areas located at the far west and east ends, and the more rural and undeveloped areas located throughout the High Desert region. Sensitive receptors within the project area include single- and multi-family residences and multi-family, residences, schools, parks, recreation areas, playgrounds, golf courses, places of worship, medical facilities, and cemeteries, hotels/motels, restaurants. Existing noise levels were recorded at 66 locations and modeled at 32 locations, which were acoustically representative of the entire area within the limits of the project. The existing ambient noise levels measured were between 42 and 70 A-weighted decibels (dBA).

Project Impacts

There would be substantial increases in noise in most of the areas because the mainline alignment is a new freeway and noise sensitive receivers have no existing traffic. In contrast, some areas would experience a drop in noise levels after the project is constructed because the retaining walls for the new connectors would shield mainline traffic noise to the receptors.

The traffic noise analysis indicates that residential areas, a school, a park, and a church within the project limits would be impacted after project completion under the Freeway/Expressway Alternative (i.e. the noise level will approach or exceed Federal Highway Administration [FHWA] Noise Abatement Criteria [NAC]). Noise abatement is considered where noise impacts are predicted, where frequent human use occurs, and where a lowered noise level would be of benefit.

The rail noise study was also conducted and the results reveal that the highway noise is predominant. Rail noise effect is considered negligible for this project.

Reasonable Foreseeable Actions

Reasonable foreseeable actions include construction of additional residential uses, which would result in an increase in the number of receptors that may be exposed to traffic noise associated with the HDC Project, and generation of additional traffic that would use the HDC and other roadway projects identified above. The Desert Gateway Specific Plan has residential properties proposed within close proximity of the proposed project; however, there is no approved residential project at this time. A portion of the HST, XpressWest, and their respective rail stations would also be within the resource study area.

Cumulative Impacts

The project long-range analysis (year 2040) reflected the growth projections approved by SCAG. As a result, the 2035 noise analysis of traffic noise reflects the anticipated population growth and traffic that would be associated with cumulative projects; therefore, except for the HST and XpressWest, cumulative noise levels would be the same as those evaluated for the project. The noise impacts associated with the HST would occur only as the train is passing the affected receivers. As a result, the extent of the impacts would depend on the number and timing of the trips. The HST also proposed noise abatement to reduce the impacts associated with the rail activity; however, even with abatement, there would still be increased noise levels for those receptors that are exposed to noise levels of the HDC, HST, and XpressWest.

The proposed project, in combination with related transportation, energy, and other development projects would primarily affect noise levels in urbanized areas along the alignment. The cumulative impact would not be considerable.

Biological Resources

Resource Study Area

The resource study area for biological resources is generally 500 feet in width over most of the 63-mile length with few exceptions at interchanges, intersections with on-/off-ramps, where the rail line and highway separate, and in few areas where the roadway narrows. The total area within the biological study area (BSA) is approximately 9,037 acres.

Current Condition and Historical Context

The High Desert region of the proposed HDC is largely undeveloped, which leaves the area open to more biological resources. Particularly near the Mojave River, these natural resources are able to flourish. The Mojave River, and several other waterways, provide for wildlife movement within the study area. The majority of the plant habitat in the study area consists of native species. The project area provides habitat for a number of special-status, threatened, and endangered species.

Project Impacts

The project would have impacts to sensitive plant and animal species and their habitats, including Joshua tree woodland (special-status), creosote bush scrub, saltbush scrub, non-native grassland, and riparian woodland (special-status). Designated Critical Habitat

(DCH) for southwestern willow flycatcher occurs within the Mojave River at all proposed crossing locations and would be an unavoidable impact with implementation of the project. Signs of the desert tortoise were observed in a few locations in San Bernardino County, along with impacts to the DCH within the Mojave River. The project would also affect jurisdictional waters and wetlands within the Mojave River.

Reasonable Foreseeable Actions

Future development and planned transportation projects would result in permanent and temporary loss of habitat for plant and wildlife species in the area. The Victorville 2 Hybrid Power Plant is anticipated to affect three special-status animal species, including the desert tortoise, Mohave ground squirrel, and burrowing owl; it may also affect special-status plants. The Yucca Loma Project would affect over 1 acre of Mojave riparian forest. XpressWest would affect plant and animal species and their habitats. The HST project has the potential to affect California, State, and Federal Threatened and Endangered species, as well as their habitats.

Cumulative Impacts

The disturbance of plant and animal species and loss of habitat that would accompany future development and infrastructure and roadway projects in the project area would adversely affect sensitive species and their habitats in the study area.

The project and cumulative projects could also indirectly affect adjacent habitat during construction or operation. During construction, noise or vibration could affect burrowing animals or nesting raptors. Runoff from the construction sites or operational roadways could affect water quality next to the project sites, which could degrade habitat quality. Night lighting during construction or operation of the projects could interfere with typical foraging or predation of nocturnal species in adjacent open space areas, increasing the potential for some wildlife to avoid these areas.

Should Variation E with HSR be part of the preferred alternative, this project may have a substantial impact on the southwestern willow flycatcher and the least Bell's vireo, which are identified as endangered at both the State and federal levels. Although no other projects have impacts to this species, the small size of this area in comparison to the desert region makes the impact high; therefore, it contributes to a cumulative effect on this species.

To avoid or offset potential cumulative effects on biological resources, individual projects would implement avoidance, minimization, and/or mitigation measures. These measures include, but are not limited to, preconstruction biological surveys, biological monitoring, BMPs, construction contract standard provisions, contract nonstandard provisions, environmental awareness training, and habitat compensation to mitigate for potential effects to federally and State-listed species.

The proposed project, in combination with the related projects, would result in the conversion of special habitat areas and other biological resources in the area of cumulative analysis. There would be an associated loss of common plant and animal species, and a cumulative loss of habitat for common special-status species.

Transportation, energy, and development projects would cumulatively affect plant and animal species, including the desert tortoise, Mohave ground squirrel, burrowing owl, and other special-status plant and animal species, particularly near the Mojave River area of the proposed project.

While mitigation would reduce impacts to biological resources, when taken collectively, the proposed project would have a considerable contribution to the cumulative effects to biological resources.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and/or mitigation measures identified in each topical section in this document would serve to minimize cumulative impacts to the extent feasible. As each project is evaluated for environmental impacts, project-specific mitigation measures would apply, which would reduce the cumulative impact.

This page intentionally left blank.