# Chapter 2 Project Alternatives

This chapter describes the proposed action and the project alternatives developed to meet the purpose and need of the project, while avoiding or minimizing environmental impacts. The project is being developed in response to existing and projected traffic demands and development. The alternatives are the Freeway/Expressway Alternative, Freeway/Tollway Alternative, Freeway/Expressway with High Speed Rail (HSR) Feeder Service Alternative, Freeway/Tollway with HSR Feeder Service Alternative, and the No Build Alternative.

The project is located in the counties of Los Angeles and San Bernardino on SR-138 from SR-14, continuing east to Llano where it connects to the SR-18 to Apple Valley. The total length of the project is approximately 63 miles. Within the limits of the proposed project, SR-138 is a four-lane road that tapers to two lanes from Avenue T to Llano, and SR-18 varies between two to four lanes, except for the section on I-15 that consists of six lanes. The purpose of the proposed project is to improve east-west mobility through the High Desert region of southern California to accommodate existing and future transportation demand, improve travel safety and reliability, improve the regional goods movement network, provide improved access and connectivity to regional transportation facilities, and contribute to state greenhouse gas (GHG) reduction goals.

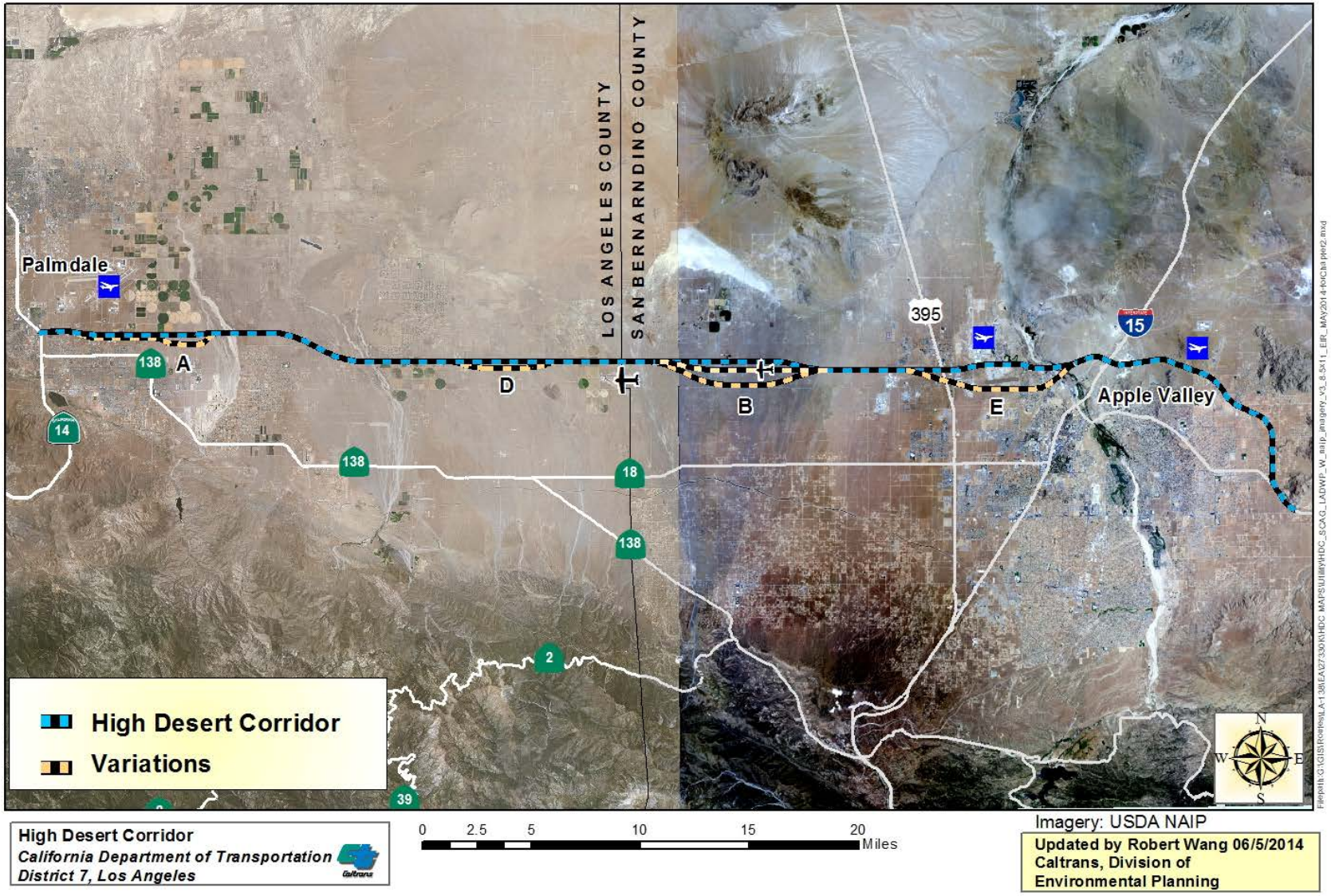
## 2.1 Alternatives

The High Desert Corridor (HDC) is divided into three segments, including the Antelope Valley Segment (SR-14 to 100$^{th}$ Street East), the High Desert Segment (100$^{th}$ Street East to US 395), and the Victor Valley Segment (US 395 to SR-18), as described in Chapter 1 (see Figure 1-2). Recognizing it as a multipurpose corridor with potential to connect to the expanding regional rail system, the project may include a center-median HSR feeder service between Palmdale and Victorville. In addition, bicycle facility and green energy components would be incorporated into the design features of all alternatives of the corridor evaluated in this environmental document.

A No Build Alternative and four build alternatives are being considered, as listed below. Figure 2-1 shows the primary alignment and variations in certain location.

- No Build Alternative
- Freeway/Expressway Alternative
- Freeway/Tollway Alternative
- Freeway/Expressway with HSR Feeder Service
- Freeway/Tollway with HSR Feeder Service

## Figure 2-1 Alternative Alignments



Other alternatives, including a Transportation System Management (TSM) plan and Hybrid Alternative were studied, but they are no longer being considered. They are discussed later in Section 2.7 (Subsections 2.7.6 and 2.7.7) of this chapter.

Selection of a preferred alternative will be based on how well each project alternative is able to meet the project purpose and need (discussed in Chapter 1), address impacts to the community and environment, and be cost effective.

### 2.1.1 No Build Alternative

Under the No Build Alternative, no new transportation infrastructure would be built within the project area to connect Los Angeles and San Bernardino counties, aside from existing SR-138 safety corridor improvements in Los Angeles County and SR-18 corridor improvements in San Bernardino County. Traffic circulation and congestion currently experienced on Palmdale Boulevard, Pearblossom Highway, Air Expressway, Palmdale Road, and Happy Trails Highway (existing SR-18) would remain from increasing transportation demand. Accident rates on SR-138 would remain high or increase. Flooding would continue to occur along the SR-18/SR-138 corridor during major rain events because most of the area roads are built at grade with no barriers to stop or channel rainwater. The regional movement of goods would be slower due to an overloaded transportation network. Access to regional airports, rail facilities, and other means of transportation would be limited. Opportunities to contribute to State GHG reduction goals resulting from reduction in GHG emissions from the efficient movement of vehicles in the area, as well as green energy facilities that would be part of the HDC Project, would be lost. The No Build Alternative also functions as a baseline for purposes of NEPA against which all of the proposed build alternatives are compared.

### 2.1.2 Freeway/Expressway Alternative (Avenue P-8, I-15, and SR-18)

This alternative would construct a combination of a controlled-access freeway and at-grade expressway for a total distance of 63 miles. The corridor from SR-14 to US 395 would be 500 feet wide and from US 395 to SR-18 would be 300 feet wide. The alignment generally follows Avenue P-8 in Los Angeles County and then runs slightly south of El Mirage Road in San Bernardino County. The alignment then extends to Air Expressway Road near I-15 and curves slightly southeast to terminate at Bear Valley Road near Apple Valley.

Four physical alignment variations are being considered. Details of the variations are presented in Section 2.3 of this chapter.

- Variation A: Near Palmdale, the freeway/expressway would dip slightly south of the main alignment, approximately between 15$^{th}$ Street East and Little Rock Wash.
- Variation B: East of the county line, the freeway/expressway would flare out slightly south of the main alignment between Oasis Road and Coughlin Road. Another option for Variation B is called Variation B1, which is shorter than Variation B and would run slightly south of the main alignment.

- Variation D: Near the community of Lake Los Angeles, the freeway/expressway would dip slightly south of the main alignment, just south of Avenue R, approximately between 180th Street East and 230th Street East.
- Variation E: Near Adelanto and Victorville, the freeway/expressway would dip south of the federal prison.

Bicycle facility and green energy components would be incorporated into the design features of this alternative.

The lane configurations for this alternative are presented in Section 2.4.3, Lane Configuration. The anticipated project cost for this alternative in 2014 dollars is $3.59 billion.

### 2.1.3 Freeway/Tollway Alternative (Avenue P-8, I-15, and SR-18)

This alternative would follow the same route as the Freeway/Expressway Alternative (with variations A, B, D, and E), but it would have sections that operate as a tollway. The segment where toll lanes are proposed, four in each direction, would begin from 100th Street East in Palmdale and end at US 395 in Victorville. The Central Segment would consist of a toll facility, and motorists who choose not to use this segment of the HDC would have the option to exit and use local west-east parallel roads adjacent to the HDC and reenter the freeway segments from either 90th Street East in Palmdale or US 395 in Adelanto. Each toll lane would be 12 feet wide.

Bicycle facility and green energy components would be incorporated into the design features of this alternative.

The lane configurations for this alternative are presented in Section 2.4.3, Lane Configuration. The anticipated project cost for this alternative in 2014 dollars is $3.61 billion.

A Public Private Partnership (PPP) option for funding this alternative would be utilized. A PPP is a joint venture with a level of public control and oversight for private infrastructure investment. PPPs are a creative way to fund highway projects such as this alternative through leases, not sales. Title would remain with the public authority, in this case Caltrans or another sponsor, whose responsibility shifts from building and managing transportation facilities to managing contracts with private partners. If this PPP option were chosen, the lessor (private partner) would pay a concession fee and usually keeps the revenue stream from the tolls in return. The lessor would be the party responsible for contracting to design, build, finance, operate, and maintain the toll lanes for the foreseeable future. Dating back to the 19th century, this form of private investment was used to build and operate toll bridges and roads and to finance railroads in the United States.

Under this alternative, some design variations may be required to accommodate the needs of the PPP analysis (see Section 2.3 for variation details).

The toll segment(s) would likely be an all Electronic Toll Collection (ETC) System. The operation would be completely electronic with no toll booths or traffic gates. Collection of tolls would occur at the speed of flowing traffic, which means that motorists never have to slow down; therefore, the traffic would remain free flowing. This would be accomplished by using either transponders (e.g., FasTrak), registered accounts linked to license plates (e.g., ExpressAccount), or billing to the registered vehicle owner (e.g., One-Time-Toll).

### 2.1.4 Freeway/Expressway Alternative with High-Speed Rail Feeder/ Connector Service

This alternative would be the same route as the Freeway/Expressway Alternative, but it also includes an HSR Feeder Service between Palmdale and Victorville. Variations A, B, D, and E were considered, but Variation A was later determined to be not a viable variation for the alternatives with HSR due to some geometric constraint. Additional elements would include bikeways and green energy facilities as described under the Freeway/Expressway Alternative.

The HSR component of the HDC would operate as a new west to east passenger rail corridor from the existing Metrolink station in Palmdale (Antelope Valley) to Victorville (Victor Valley). This service could also conveniently allow rail passengers to continue on to Las Vegas without having to change trains at Victorville (a one-seat ride). It would fill a gap by providing a crucial missing interregional link between two major rail infrastructure investments currently in the planning stages for southern California, the California HSR and the XpressWest, formerly known as Desert Xpress.

#### *High-Speed Rail Feeder Service Technology and Design Requirements*

The HSR Feeder Service would consist of steel wheels on track and would have a maximum operating speed of 180 miles per hour (mph). The HSR Feeder would be built within the HDC right-of-way (ROW). The area needed for this rail facility would be approximately 160 feet wide to accommodate the tracks and associated structures. The rail alignment would primarily run in the median of the HDC freeway. Certain areas would require additional ROW to allow the train to negotiate curves and reach the train station. A 52-foot buffer would be kept from the edge of the freeway to the railway travel path for safety and maintenance access.

#### *Facility Options*

Under this alternative, Caltrans proposes to connect the HDC with two rail passenger stations, one within Palmdale in Los Angeles County and the other within Victorville in San Bernardino County. These station locations were chosen for their accessibility and close proximity to populated areas.

##### *Victorville Passenger Station*

Although the Victorville Station is proposed as part of the HDC, it would not be constructed under the HDC Project. This station would be constructed in conjunction with the XpressWest HSR service between Las Vegas and Victorville as currently

planned. The Victorville Station location would be co-located with Victorville Station 3 (VV3) referenced in the Desert Xpress Final Environmental Impact Report (EIR) and Record of Decision. This is the Agency Preferred Station option. It would be located immediately west of I-15, at Dale Evans Parkway.

### *Palmdale Passenger Station*

The Palmdale Station would be located at or near the Palmdale Transportation Center (PTC) at Sierra Highway. Caltrans has conducted an alternative analysis of several rail alignment approaches as a part of the HDC effort for future integration with the California HSR station at Palmdale.

## *Station Connection*

To connect to the Palmdale and Victorville rail stations, ROW would be required for the station connection approaches as the HSR Feeder/Connector alignment curves away from the HDC ROW and to provide overnight storage for the trains. The footprints of the Palmdale and Victorville rail connections are shown in Figures 2-2 and 2-3, respectively.

### *Palmdale Rail Connection*

For the Palmdale rail connection, two rail connection approaches are proposed for connecting the HDC to the California HSR network, Options 1 and 7 (see Figure 2-2). Both options allow for eastbound and westbound tracks on the HDC to connect to the California HSR network northbound and southbound tracks by using a combination of aerial and cut-and-cover or tunneling structures.

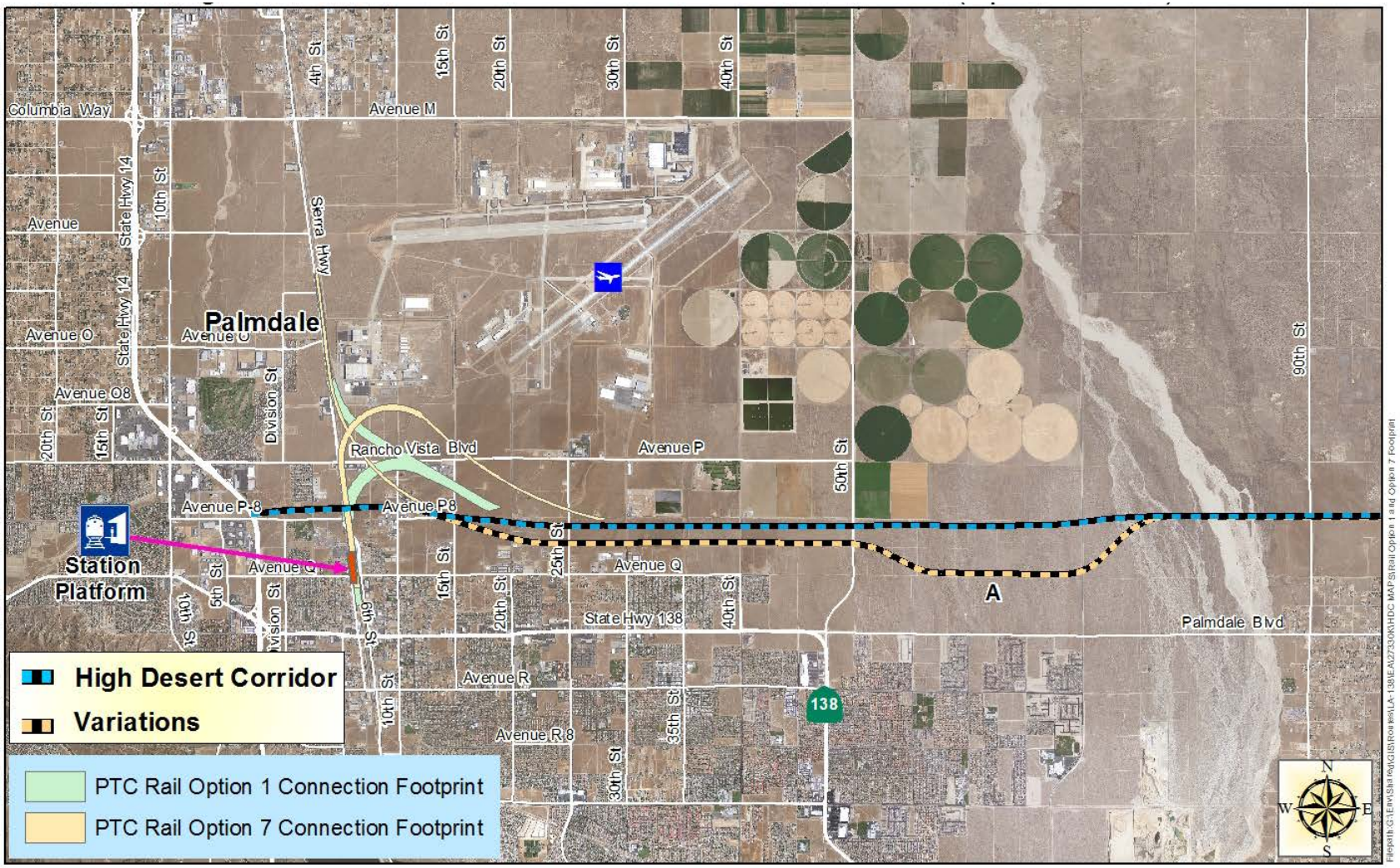
### *Rail Option 1*

Option 1 would shift the existing Palmdale Transportation Center south approximately 800 feet and would require a cut-and-cover box and mined tunnels configuration. This option would encroach into the Air Force Plant 42 parking lot associated with the Palmdale Airport. The alignment would also cross under commercial development at Rancho Vista Boulevard and 15$^{th}$ Street East. This option would diverge outside of the HDC median and would require only two rail tracks to cross under the HDC westbound lanes, reducing the ROW needed for the HDC.

### *Rail Option 7*

Option 7 would require a mix of aerial structures and tunneling, and it would allow the Palmdale Transportation Center to remain at its current location. This option would encroach into a small residential area near 10$^{th}$ Street East and would require a four-track section within the HDC median, necessitating a larger ROW section for the HDC in this area.

**Figure 2-2 Palmdale Rail Connection Options 1 and 7**



As part of the design refinement, the California High-Speed Rail Authority has proposed the modification to the "wye" (track splits) connections associated with HDC Rail Options 1 and 7, and parking associated with each of the three proposed variations as outlined below and graphically shown in Figure 2-3 to Figure 2-8. Since the preliminary design of each variation is still under study, the environmental impact for each variation of Options 1 and 7 is analyzed and presented in Appendix M of this EIR/EIS. If the preferred variation(s) are selected, the impacts of the proposed variation(s) will be incorporated into the Final EIR/EIS.

*Variation A*

This variation would place the HDC and Metrolink station platforms on the west side of SR-14 inside the Union Pacific Railroad (UPRR) ROW. The HDC platforms would be approximately 20 feet in width and 1,400 feet in length. The Metrolink platforms would be approximately 50 feet in width and 500 feet in length. The HDC platforms would extend from Transportation Drive to about 700 feet north of Avenue Q. Station area parking is proposed at the terminus of 6$^{th}$ Street (UPRR/Sierra Highway) and would provide 6,200 surface parking spaces. The existing Palmdale Transportation Center would be shifted approximately 800 feet south of its current location.

*Variation B*

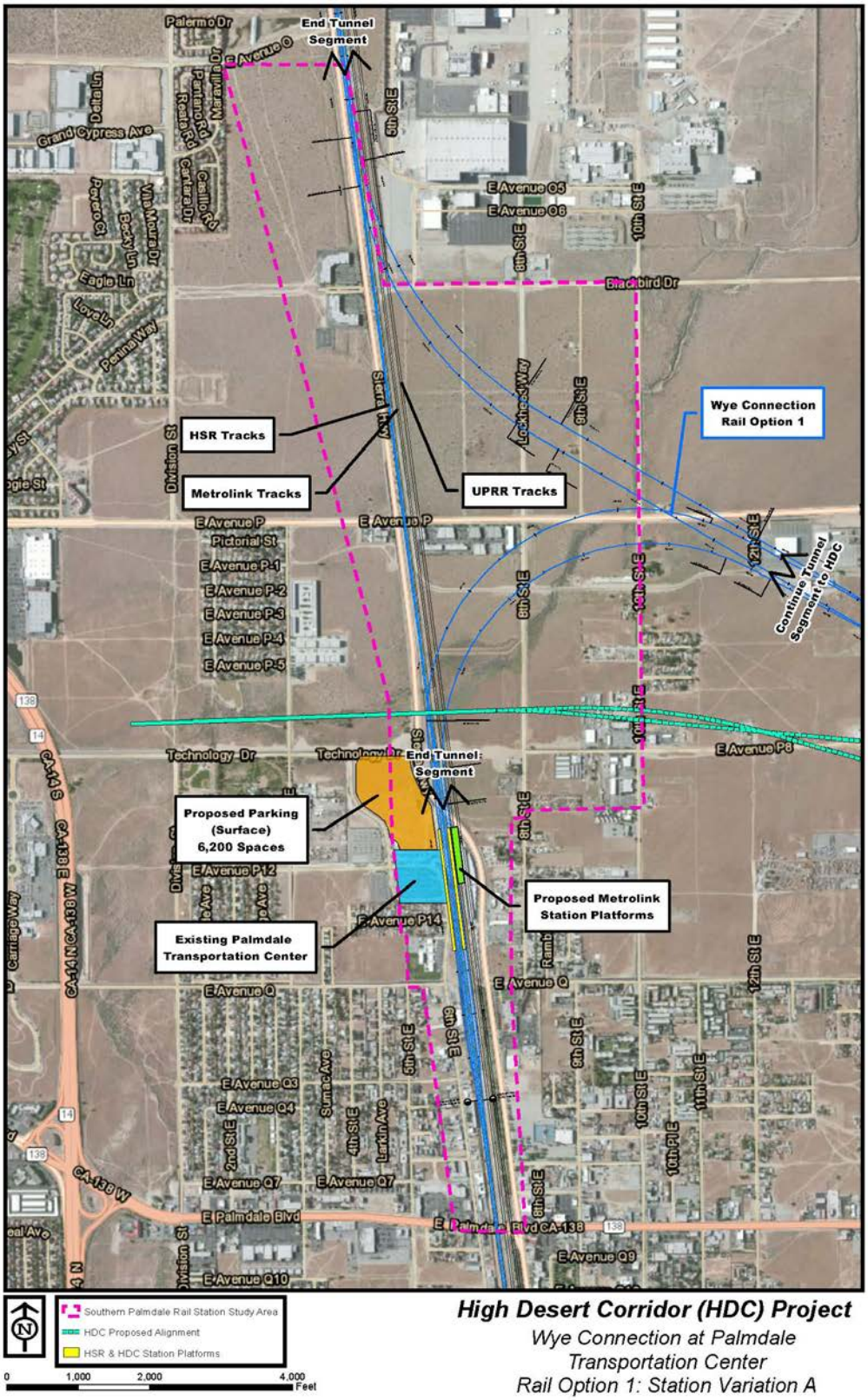
This variation is the same as Variation A with the following exceptions: (1) HDC station platforms would extend from just north of Avenue Q and immediately north of Avenue Q3; and (2) this option would not affect the location of the existing Palmdale Transportation Center.

*Variation C*

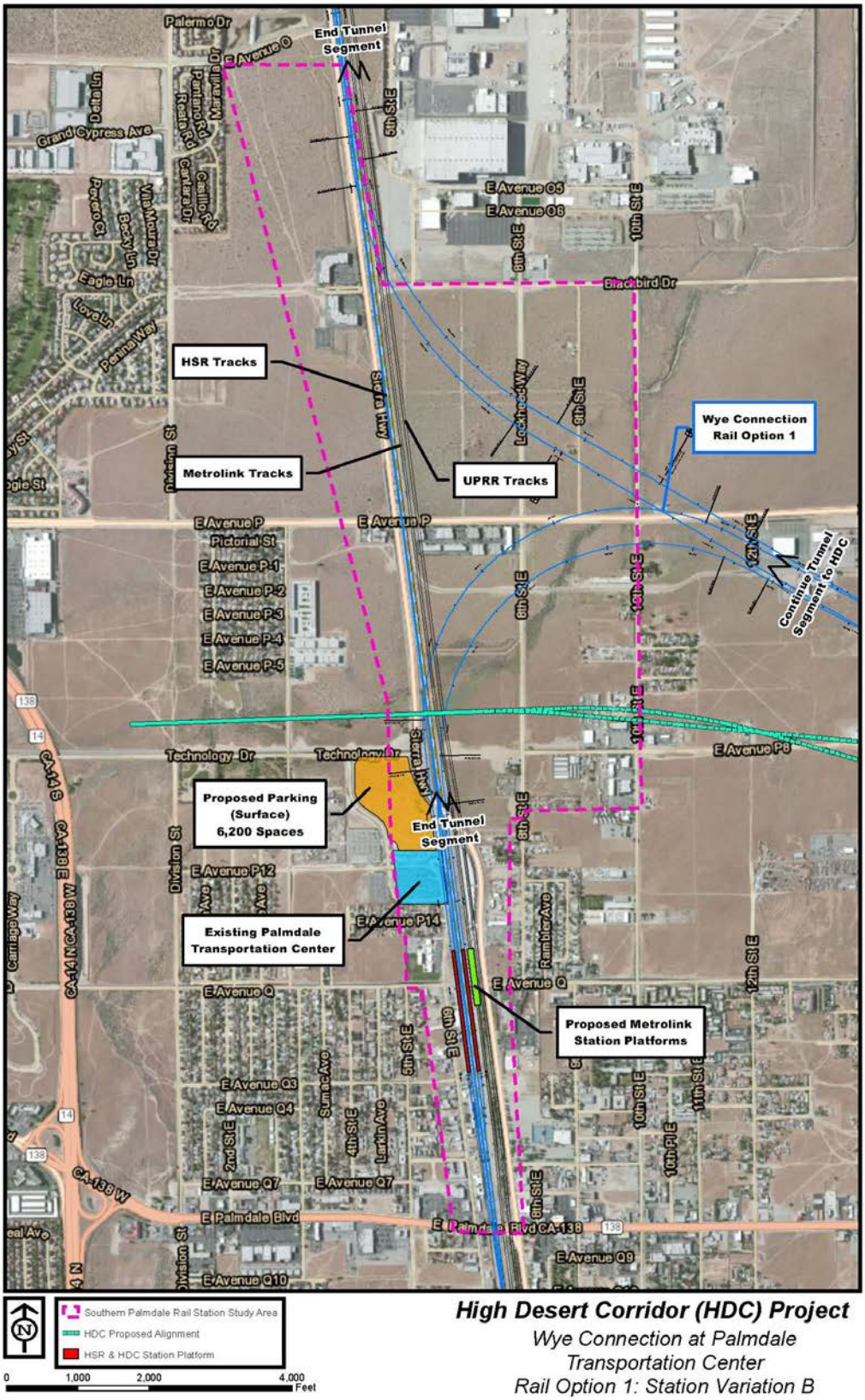
This option would place the HDC and Metrolink station platforms on the west side of Clock Tower Plaza East and outside of the UPRR ROW. The HDC platforms would extend from East Avenue Q to East Avenue Q4. Station area parking is proposed at the terminus of 6$^{th}$ Street (UPRR/Sierra Highway) and would provide 6,200 parking spaces (via an above-grade structure). This option would not affect the location of the existing Palmdale Transportation Center.

Station location variations are the same for Rail Options 1 and 7, although the "wye" connections differ, as well as the corresponding details on location and tunnel/aerial configurations.

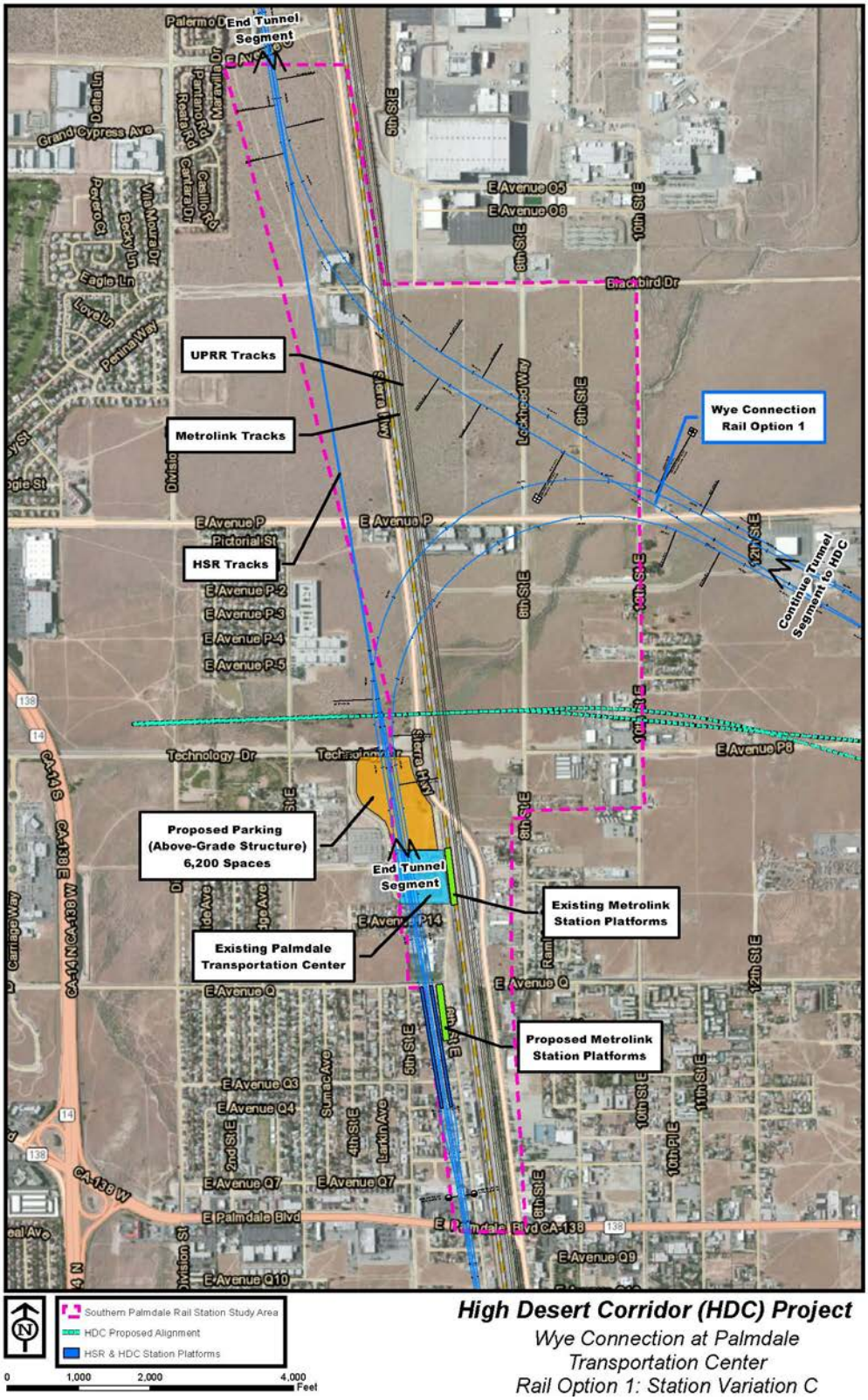
## Figure 2-3 HDC Rail Option 1 Variation A



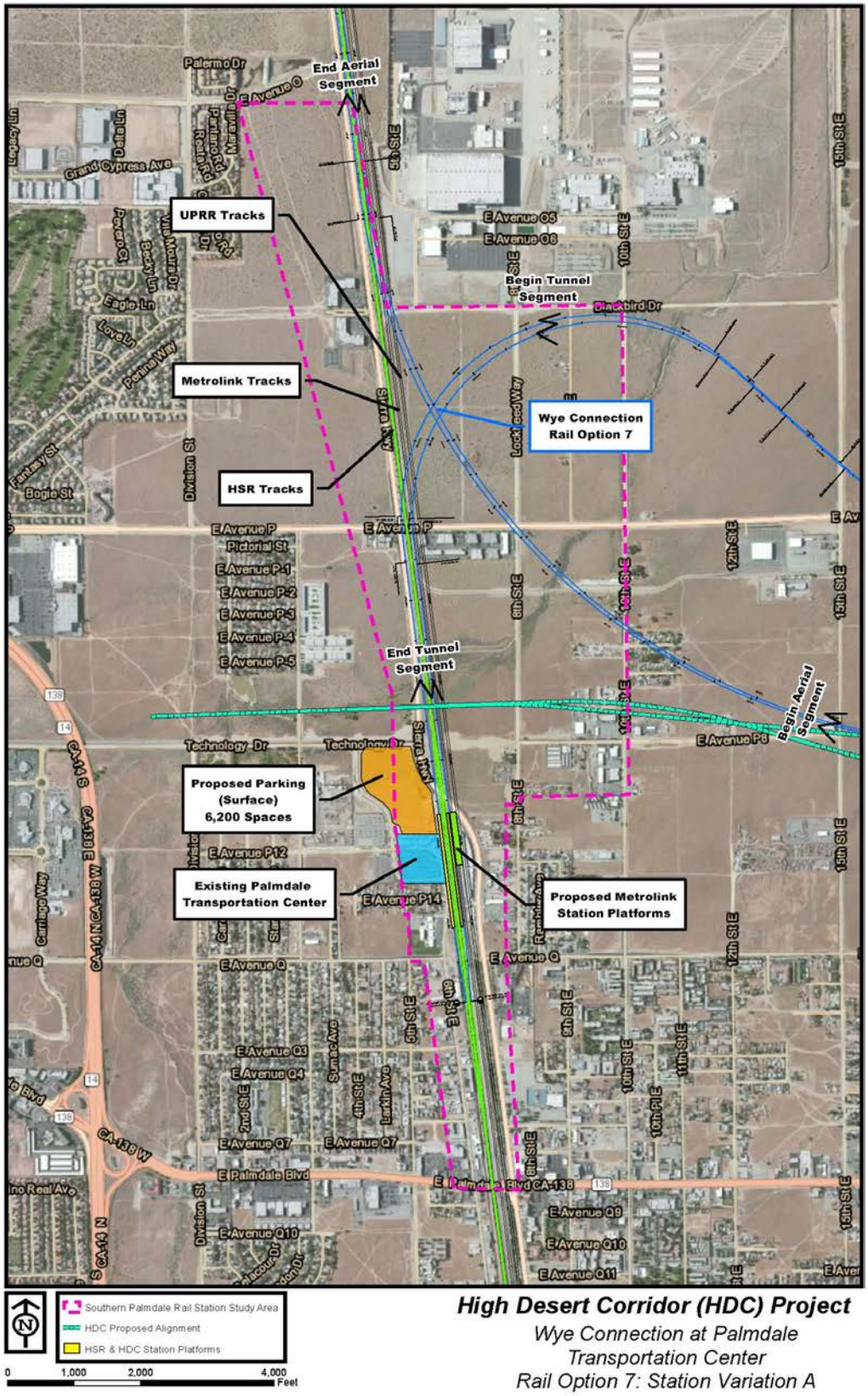
## Figure 2-4 HDC Rail Option 1 Variation B



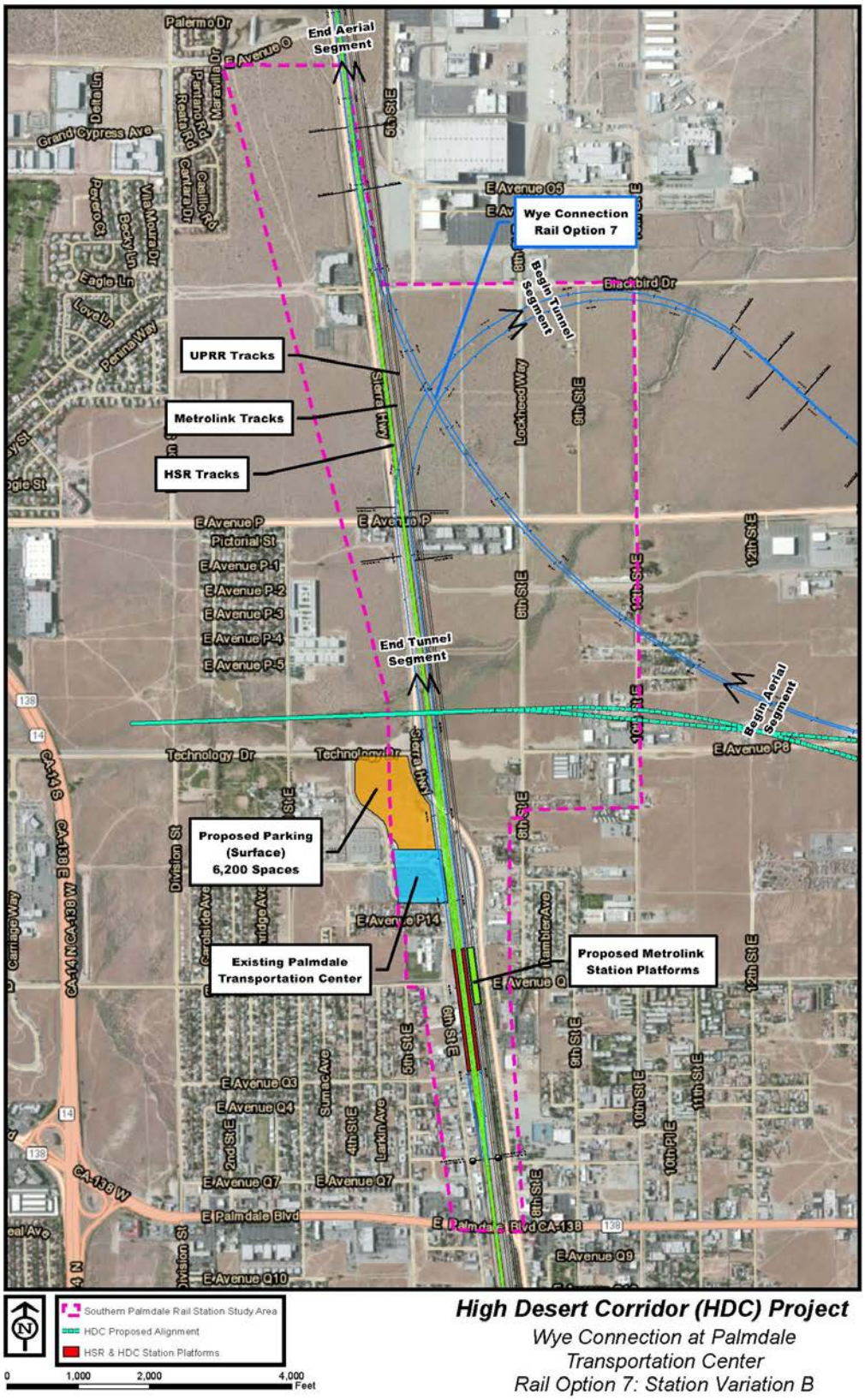
## Figure 2-5 HDC Rail Option 1 Variation C



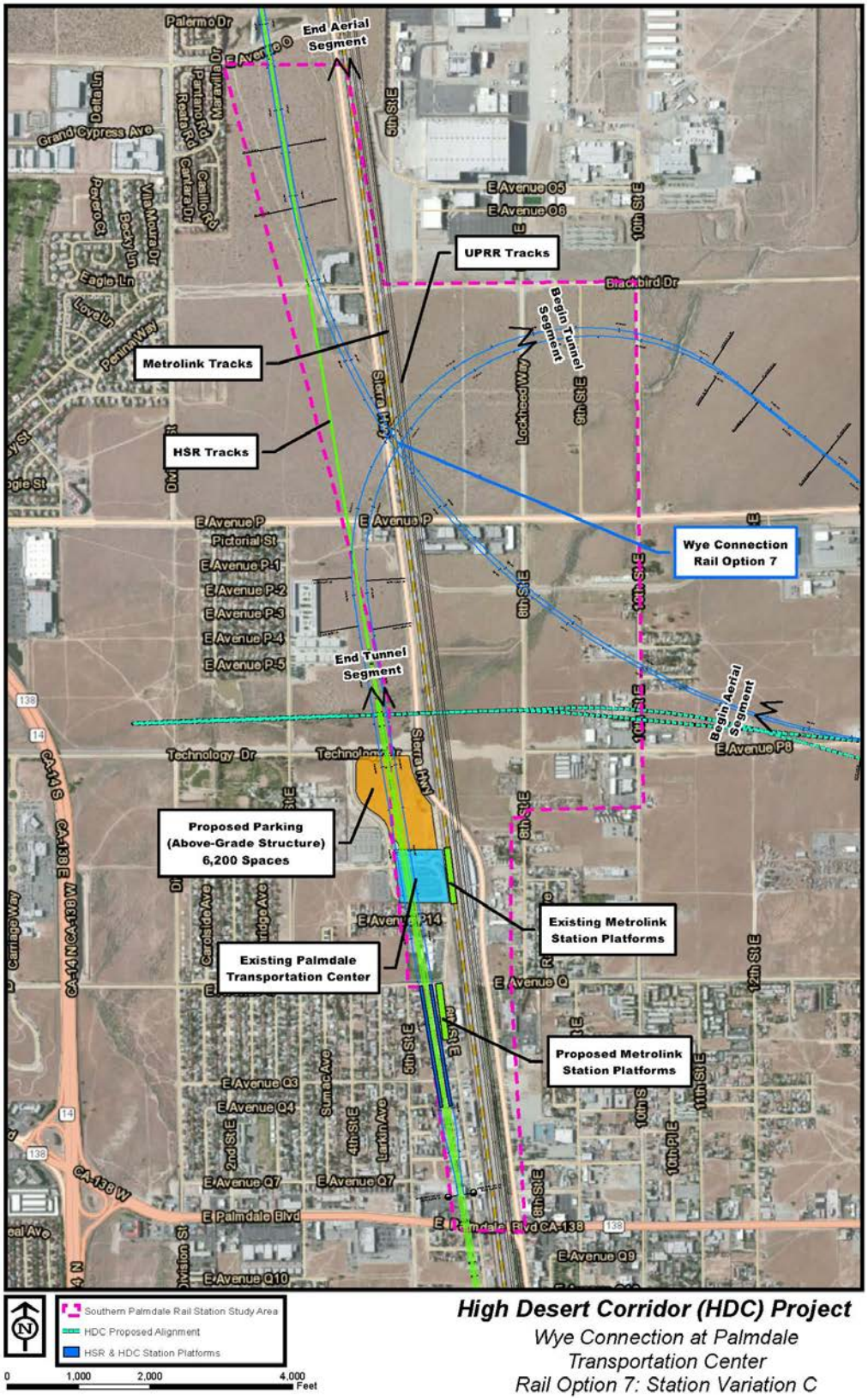
## Figure 2-6 HDC Rail Option 7 Variation A



## Figure 2-7 HDC Rail Option 7 Variation B



## Figure 2-8 HDC Rail Option 7 Variation C



### Victorville Rail Connection

Caltrans has evaluated several rail connection approaches for connecting the HDC HSR Feeder/ Connector track alignment to the XpressWest rail network at Victorville. Two alignment options are being evaluated in this environmental document as illustrated in Figure 2-9. The proposed HDC rail tracks would connect to the southernmost limits of the XpressWest Victorville Station tracks. The Victorville XpressWest station, including the station footprint, would not be part of the HDC Project. Both options would allow eastbound and westbound travel by using a combination of culverts and bridges, as well as fill material.

#### Northern Alignment Option 1

Northern Alignment Option 1 would cross over the Mojave River and Quarry Road and gradually curve northeast until it crosses the Variation E Option at Walton Drive. This option diverges outside of the HDC median in a trench and requires only two rail tracks to pass under the HDC westbound travel lanes, HDC on-ramp, and Mojave Railroad, where the connector tracks would be constructed on fill material to connect to the southernmost limit of the XpressWest tracks. This option would encroach into three Bureau of Land Management (BLM) parcels. The alignment lies within an area currently identified as a mix of commercial, transportation, open space, and passive open space under the Desert Gateway Specific Plan for the City of Victorville.

#### Variation E Alignment Option

The HSR Variation E Alignment Option spurs off the HDC alignment at East El Evado Road in a northeasterly direction at approximately 0.5 mile south of the Northern Alignment Option 1 by traversing the Mojave River and crossing the Northern Alignment Option 1 at Walton Drive. This option diverges outside of the HDC median and would require only two rail tracks to cross under the HDC westbound and eastbound lanes, and it would be connected to the southernmost limit of the XpressWest tracks. This option would encroach into two BLM parcels and would affect about 10 single-family homes. Under the Desert Gateway Specific Plan, this alignment would lie within an area currently identified as a mix of commercial, transportation, open space, and passive open space.

### Technology Options for Trains

Caltrans has hired the consultant to evaluate two possible technology options to power the trains for the HSR facility, including diesel-electric (maximum operating speed of 125 mph) and electric (maximum operating speed of 180 mph). Based on the results of the analysis, the favorable option being considered is the electric option because of its compatibility with the XpressWest rail system.

Regardless of the power source, both options would require the same amount of rail footprint, except the electric-powered option would require overhead guide wires and related support posts that would follow the rail tracks and would need electrical substations and transformers (each occupying a 4,000 to 5,000 square foot area at 10-mile intervals along the rail corridor).

## Figure 2-9 Victorville Rail Connection

### *Alignment*

Placement of the rail alignment in the center of the HDC is more desirable than placement along or parallel to the freeway's shoulder. This is true in the urbanized areas because it would minimize any potential land use conflicts within developed areas. Placement of the tracks in the center of the HDC would help minimize impacts to residents and businesses because no addition ROW acquisition would be required. In addition, noise and visual impacts, as well as impacts to property access, would be minimized.

For non-urbanized areas, placing rail alignment in the center of the HDC would minimize environmental effects to sensitive resources. Those resources include, but are not limited to, threatened and endangered species (including habitat areas), cultural resource sites, hydrological features, and scenic vistas.

Anticipated project cost for this alternative in 2014 dollars is ranging from $2.63 to 4.53 billion for the rail component options, and $3.59 billion for the highway component.

### 2.1.5 Freeway/Tollway Alternative with High-Speed Rail Feeder/ Connector Service

This alternative would follow the same route as the Freeway/Tollway Alternative (including Variations A, D, B and E), but it also includes an HSR Feeder Service between Palmdale and Victorville. Similar to the Freeway/Tollway Alternative, the bicycle facility and green energy components would be incorporated into the design features of this alternative.

The highway lane configuration for this alternative is presented in Section 2.4.3, Lane Configuration. The design requirements for the HSR Feeder Service are the same as that discussed in Section 2.1.2.3. Similar toll system elements, as discussed in Section 2.1.2.3, would be constructed as part of this alternative.

A PPP option for funding this alternative would be utilized, similar to that described in Section 2.1.2.2. Anticipated project cost for this alternative in 2014 dollars is $2.63 to 4.53 billion for the rail component options and $3.61 billion for the highway component.

## 2.2 Common Design Options for the Build Alternatives

The following design options, Green Energy and Bicycle Access, would be considered for incorporation into each build alternative. In addition, an interpretive pullout (refer to Section 2.2.3 for definition) and two vista points would also be incorporated into the build alternatives. The general concept of these design options is described below. More detailed study will be undertaken during the final design of each corridor segment.

### 2.2.1 Green Energy Facility

All known viable green and sustainable technologies (www.energy.ca.gov/renewables/renewable_links.html) have been reviewed for their feasibility within the HDC. The viable options are proposed for inclusion into the project design. Technologies that have been identified to have potential for incorporation into the HDC are as follows:

#### *Photovoltaic Solar Highways*

Photovoltaic (PV) technology is one of the most promising technologies researched and is already in use at some state departments of transportation (DOT) and several international transportation highway facilities. The PV panels are generally fixed in place or on tracking systems designed to optimize the location's solar-generation capability. The PV solar power generated for Caltrans can be directly serve loads for lighting and other power requirements on the ROW, or feeding into the grid, and offsetting usage through net metering of a larger load requirement along the ROW, such as a Caltrans maintenance facility.

##### *Design Requirements and Locations*

Solar generation usually requires significant amounts of land or building roof space, and it is best suited for areas where energy does not have to travel far to connect with an existing utility transmission line. Other ideal locations would be those parcels or areas on flat land that do not have any shading concerns to impede sunlight (refer to Figures 2-10 and 2-11 for proposed solar developments near the HDC). Specific areas that may be suitable for this type of technology may be highway interchanges and/or utility substations. Solar lighting at interchange locations, at the on- and off- ramps, would conserve ROW needed and could be grid-free, not requiring any tie of hard wiring to an existing electric grid. Additional locations that may be considered are median barriers in the center of the HDC or solar panels mounted on soundwalls along the HDC. Mounting solar panels at these locations would not require additional ROW for the highway footprint.

#### *Non-Fossil Fuel Refueling Stations*

Non-fossil refueling stations are more commonly known as Alternative Fueling Stations. The U.S. Department of Energy defines alternative fuels as either alcohol blends, such as ethanol; hydrogen; biofuels (e.g., biodiesel); or natural gas (e.g., propane, compressed natural gas [CNG], and liquefied natural gas [LNG]) (Green Energy Feasibility Study, www.afdc.energy.gov/).

With stricter air quality regulations and fuel efficiency requirements, the demand for "greener" fueling and new vehicle technologies in the future is expected to be higher than at present. Businesses and communities could develop various alternative refueling dispensing facilities such as Electric Vehicle (EV) Charging Station, CNG, and LNG.

**Figure 2-10 Proposed Solar Developments in Los Angeles County near the High Desert Corridor**

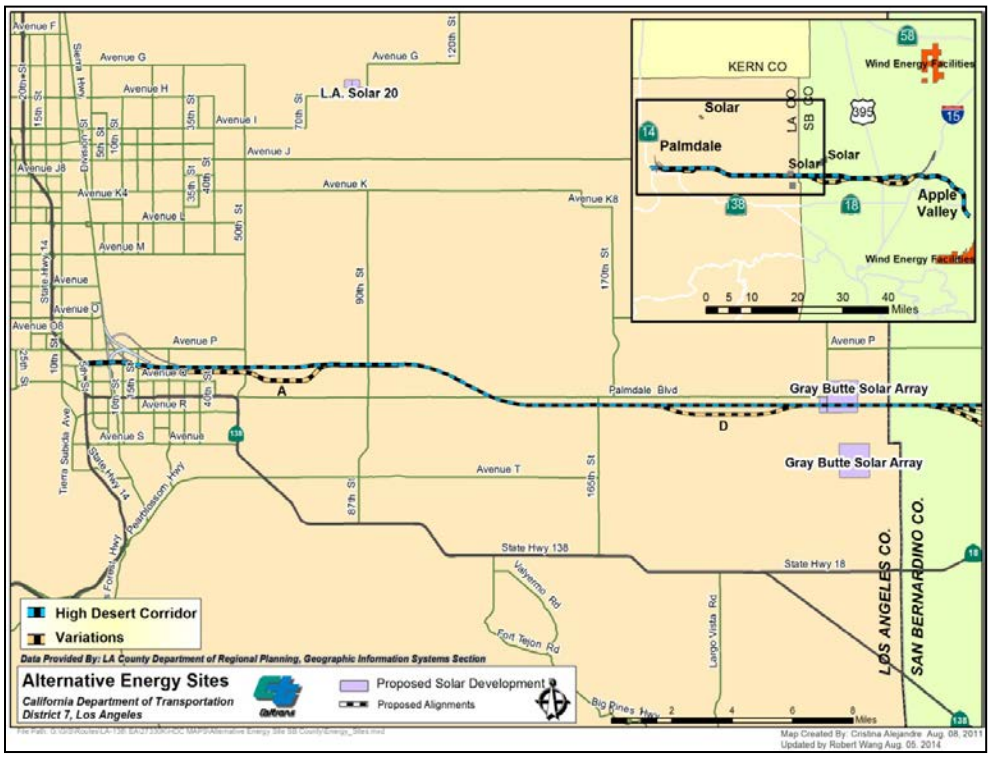
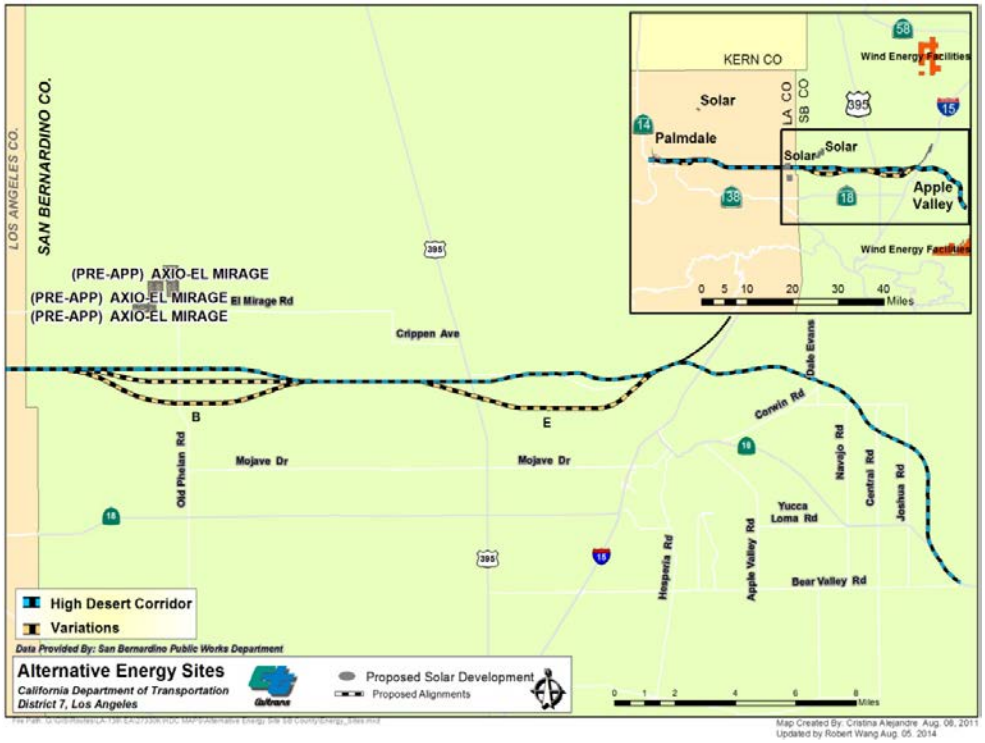



**Figure 2-11 Proposed Solar Developments in San Bernardino County near the High Desert Corridor**



Federal and State subsidies have encouraged the development of alternative fuels and technologies that use these alternative fuels. Because electricity can be generated onsite through solar shade structures, the opportunities for creating renewable energy-powered EV stations within the highway ROW are greater than for the installation of other alternative fuels (such as hydrogen, biofuels, or natural gas). The HDC presents an opportunity to construct EV charging stations powered by solar shade structures at rest stops and service areas.

### *Design Requirements and Locations*

A typical footprint necessary to construct an Alternative Fueling Station would be relatively small in comparison to a regular gas station. EV charging stations could be conveniently sited within the freeway ROW at or near interpretive pullout locations and rest areas located at or near bicycle and pedestrian paths and trails. At these pullout areas, vehicles could stop and use electricity generated onsite through solar shade structures. Solar shade structures at parking areas, especially in the hot High Desert areas, would be beneficial to freeway motorists who need to access these areas for either recreational or fueling purposes.

## ***Opportunity for Utility Utilization of Corridor Right-of-Way***

Major electrical utility providers near the HDC include Southern California Edison (SCE) and the Los Angeles Department of Water and Power (LADWP). For gas transmission, Sempra Energy (Southern California Gas Company) and Pacific Gas and Electric are the providers within the HDC area. Several water purveyors may serve the communities around the HDC. The opportunity exists for these utility companies to utilize the corridor ROW to transmit electricity, natural gas, and water; however, an assessment of the construction and operation plans will have to be undertaken to ensure that the use of this ROW by the utility companies would not adversely affect rail, highway, or bikeway safety. Environmental clearance would need to be obtained by the utility providers prior to the utilization of the corridor ROW.

### *Design Requirements and Locations*

Transmission lines, depending on their voltage capacity, carry varying amounts of electricity. Most high-voltage lines are 230 kilovolts (kV). The amount of area necessary for transmission lines would depend on how much electricity is transmitted. For high-voltage transmission, the area needed would be limited to the locations of the transmission towers, which typically have four legs on footings and air space for the power lines. Typically, the most cost-effective installation option based on industry standards would be overhead transmission; however, installation and maintenance costs pose a limitation to this option. Some jurisdictions of authority may require the power lines to be buried depending on location and circumstances. On the contrary, for lower-voltage lines, such as those found in residential areas, power poles and airspace for the power lines are needed. Gas lines would require excavation and would need to be buried. Water and sewer main pipes are expected to have similar installation requirements as gas lines. If reclaimed/recycled water is

available, installation of those lines would require special piping design per regulatory requirements.

### 2.2.2 Bicycle Access Facility

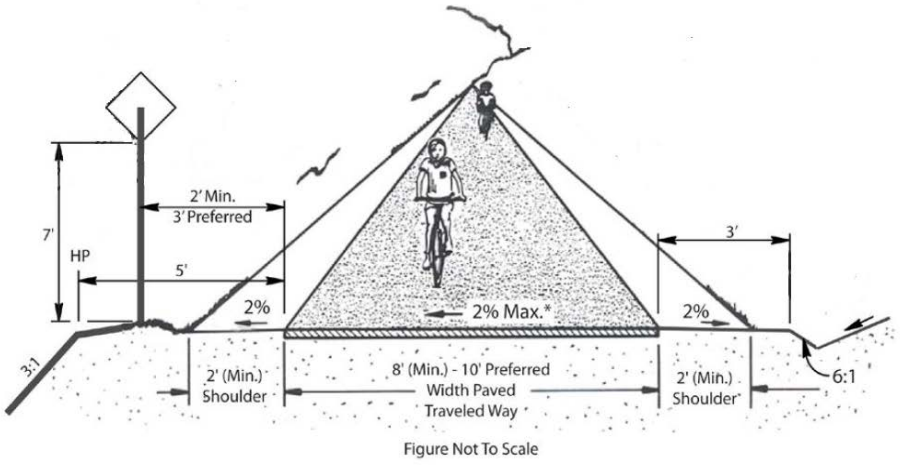
Local planning documents within the Victor and Antelope valleys show that existing bicycle facilities within the region are underdeveloped. Both the quantity and connectivity of existing bicycle infrastructure is lacking. There is no existing west-east Class I bike path[1] between the Victor and Antelope valleys. Currently, bicyclists riding between Palmdale and Adelanto/Victorville must contend with high-speed trucks and other vehicles along State highways (SR-18/SR-138) and local roads that present hazardous conditions, according to interviews with local cyclists.

An interagency meeting was conducted August 15, 2012, between bicycle coordinators from Los Angeles County, Metro, Southern California Association of Governments (SCAG), and Caltrans to obtain input on bicycle design options. The working group determined that the existing bicycle network in Los Angeles and San Bernardino counties could use a parallel bicycle facility to provide continual linkage between the bicycle networks from both counties. The bicycle path concepts and design options are summarized below.

#### *High Desert Segment*

Three types of bicycle facilities were considered for the 26-mile High Desert Segment between 20th Street East in Los Angeles County and US 395 in San Bernardino County. The bikeway would traverse the eastern portion of Palmdale and continue eastward through Lake Los Angeles towards El Mirage and terminate within Adelanto. A typical cross section for the bike path is illustrated in Figure 2-12.

**Figure 2-12 Example: Bike Path Configuration**




[1] Class I Bike Path provides a completely separated ROW for the exclusive use of bicycles and pedestrians with crossflow by motorists minimized (Source: Highway Design Manual, Chapter 1000, Caltrans 2012).

*Source: Modified from Highway Design Manual, Chapter 1000, Caltrans 2012.*

### *Type 1 – Class I Bike Path at the Bottom of Freeway Embankment*

A separate Class I Bike Facility (bike path) would be provided on the south side at the bottom of the freeway embankment with at-grade crossings at intersections. This bike path would also be separated by a concrete barrier.

A drawback for using a separated bikeway is that a large street sweeper may not be able to be used to clean the proposed bikeway. A sidewalk sweeper that fits inside the bikeway would have to be used instead or the bikeway would need to be widened to typical traffic lane widths (10 feet minimum).

### *Type 2 – Class I Bike Path along Freeway Shoulder*

A separate Class I Bike Facility (bike path) would be provided on the south side along the freeway shoulder, separated with a concrete barrier.

The creation of a separated bikeway could pose maintenance issues for Caltrans' large street sweepers, which cannot be used to clean the proposed bikeway. A sidewalk sweeper that fits inside the bikeway would be able to clean it safely to ensure bicyclists have a clean path. No street parking would be permitted along the HDC freeway/expressway facility.

### *Type 3 – Class III Bike Route along Eastbound and Westbound of the Freeway*

A signed Class III Bike Route[2] would be provided in both directions along the 10-foot-wide shoulder of the freeway. Signs would designate the portion eastbound and westbound of the freeway as a "Bike Route." Access to existing or planned bikeways would be provided using overcrossings.

The drawback of this option would be the wind blast effect to bicyclists, which would be created by high-speed vehicle traffic, particularly large trucks. At freeway speeds, the wind blast from large trucks and buses can increase the risk of falls to bicyclists. The provision of clear shoulder widths with adequate buffer between the freeway travel lanes could minimize the effect by providing greater separation between bicyclists and motor vehicles.

## *Victor Valley Segment*

A bikeway (Class III Bike Route) parallel to the expressway portion in Apple Valley would be provided from approximately Waalew Road to the easterly terminus at Bear Valley Cutoff. Signage would be provided to designate a bike route. Bicyclists would share the expressway with motorists and ride in the 10-foot-wide shoulder area. At South Road and Otoe Road, bicyclists can access two multiuse trails via Waalew

[2] Class III Bikeway (Bike Route) provides for shared use with pedestrian or motor vehicle traffic (Source: Caltrans Highway Design Manual, Chapter 1000, Caltrans 2012).

Road. Connectivity to these roads would be available via Central Avenue, which is proposed to be an at-grade intersection on the expressway portion of the HDC.

Advance warning signage would be provided to inform bicyclists that bicycling is not permitted north of Waalew Road and that they need to exit.

### 2.2.3 Multiuse Interpretive Pullout and Vista Points

One multiuse interpretive pullout in Los Angeles County and two vista points in San Bernardino County are proposed along the HDC to provide service to motorists, bicyclists, and pedestrians. A multiuse interpretive pullout is a location leisure travelers (i.e., motorists/cyclists/pedestrians) can use to obtain information about the area. Interpretive signage could be used. The interpretive signage could include information about the area's geology, the flora and fauna found in the desert, and the history of human development. The signage, which is often placed at waist height so it can be read while standing or seated (i.e., Americans with Disabilities Act [ADA]-accessible), can include a map, diagram, topographic charts, photographs, and/or drawings to illustrate information. A vista point is an area that provides motorists/ cyclists the opportunity to observe the view from outside their vehicles and bicyclists off their vehicles.

#### *Los Angeles*

The multiuse interpretive pullout would be located on the north side of the westbound HDC at the 140$^{th}$ Street East on-ramp to provide service to motorists, bicyclists, and pedestrians using the HDC. Facility amenities are conceptually illustrated in Figure 2-13 and are likely to include, but not be limited to:

- Parking lot (5 parking stalls plus an ADA stall) with solar lighting
- Wayfinding signs
- Interpretive sign with structure
- Landscaping
- Temporary irrigation
- Picnic table
- Bike rack
- Drinking fountain
- Shade structure
- Trash can
- Stamped concrete paved area
- Pedestrian solar lighting

**Figure 2-13 Multiuse Interpretive Pullout at 140th Street East, Los Angeles County**

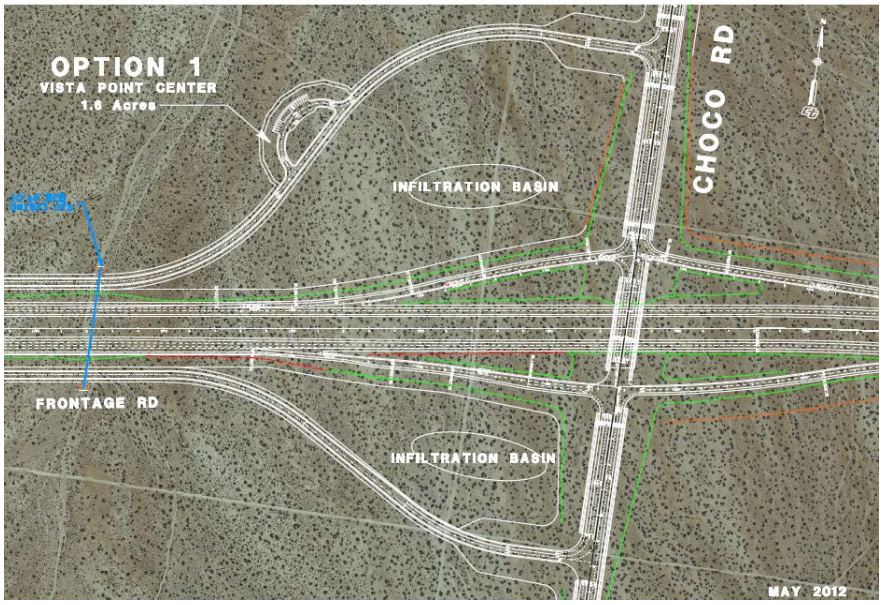
### *San Bernardino County*

#### *Choco Vista Point*

A 1.6-acre vista point is proposed near Choco Road on the north side of the HDC at the saddle between Bell Mountain and Little Bell Mountain (see Figure 2-14). This point has an elevation of 2,900 feet above sea level. Vegetation in the hill areas surrounding the vista point are dominated by creosote. Joshua trees and desert scrub are present in the area. The Town of Apple Valley has designated the adjacent area for recreational activities, such as biking and hiking on the nature trail. The vista point would be enhanced with natural stone perimeter wall, walkway, solar communications devices for the deaf, and signage with information about the site. Facility amenities are likely to include:

- Parking lot (12 parking stalls plus an ADA stall)
- Accessible walkway
- Interpretive display within the pedestrian areas
- Trash can
- Alternative energy fueling or recharging site

**Figure 2-14 Vista Point at Choco Road, Apple Valley, San Bernardino County**




### *Deadman's Point Vista Point*

Deadman's Point Vista Point would be located on Bear Valley Road where it intersects with SR-18 in Apple Valley. Overlooking Deadman's Point is a special rock formation and split pillar found 100 feet off the road. It is a locale of legends and Hollywood movies.

Deadman's Point Vista Point has a view of the beautiful open spaces of the desert valley. There are views of horse corrals, the knolls, Bell Mountain, Fairview Mountain, horseman's rock, and natural rock outcroppings. Visitors and the local community are a part of the natural environment seen in these open spaces (see Figure 2-15). Facility amenities are likely to include:

- Parking lot (15 regular parking stalls, 4 recreational vehicle [RV] or bus stalls, 2 ADA car stalls, 1 ADA van stall) with ADA-compliant access ramps and bollards for bicycle parking
- View deck (accessible for disabled persons)
- Solar-powered telecommunication devices for the hearing impaired
- Accessible walkway
- Interpretive display within the pedestrian areas
- Natural stone perimeter wall

**Figure 2-15 Deadman's Point Vista Point**
**San Bernardino County**

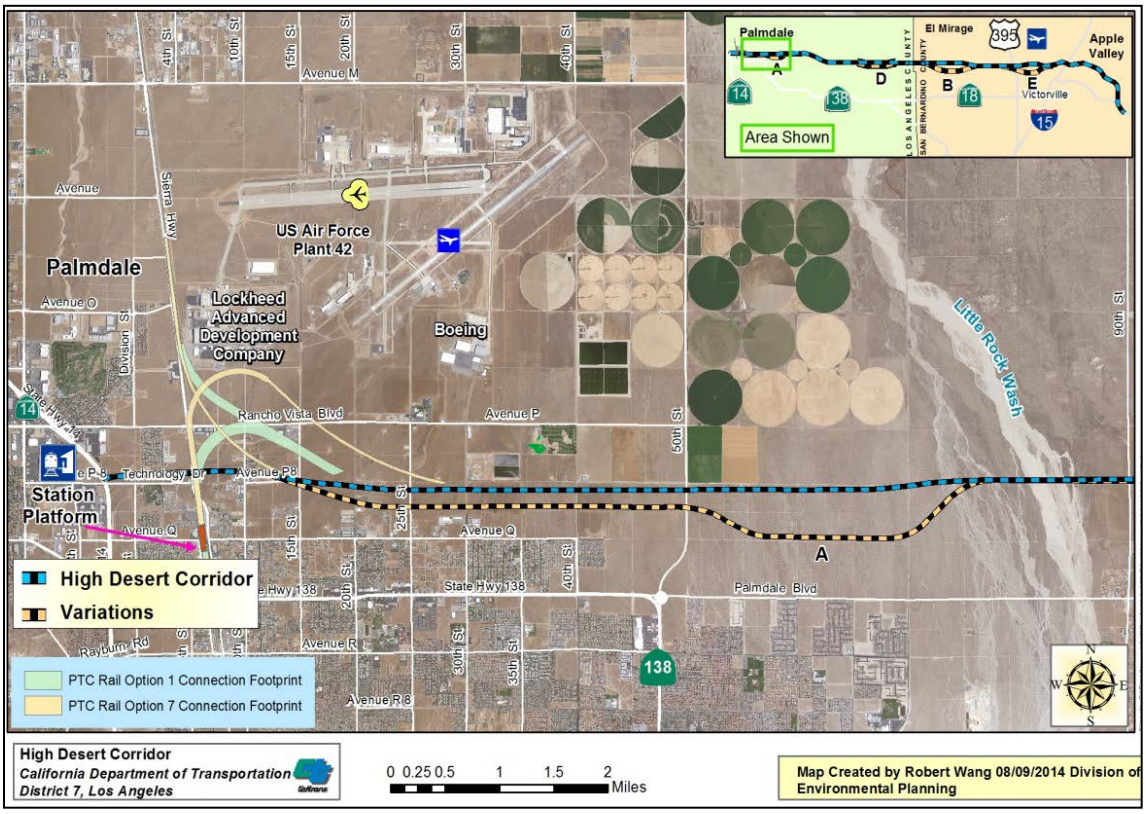
## 2.3 Build Alternative Variations

Four physical alignment variations (A, B, D, and E) are being considered to avoid or minimize environmental impacts to the community.

### 2.3.1 Variation A

Near Palmdale, the freeway/expressway would run slightly south of the main alignment, approximately between 15th Street East and Little Rock Wash for a distance of about 5 miles. In this variation, the alignment shifts would vary from approximately 800 feet south at 15th Street to 2,190 feet south from the main alignment near 70th Street and would follow the original easement that Los Angeles World Airports (LAWA) has agreed to donate to Caltrans. This variation allows maximum use of LAWA property without bisecting it. ROW required would be a 300- to 500-foot corridor for this portion. Figure 2-16 shows the Variation A alignment.

**Figure 2-16 Variation A Alignment**

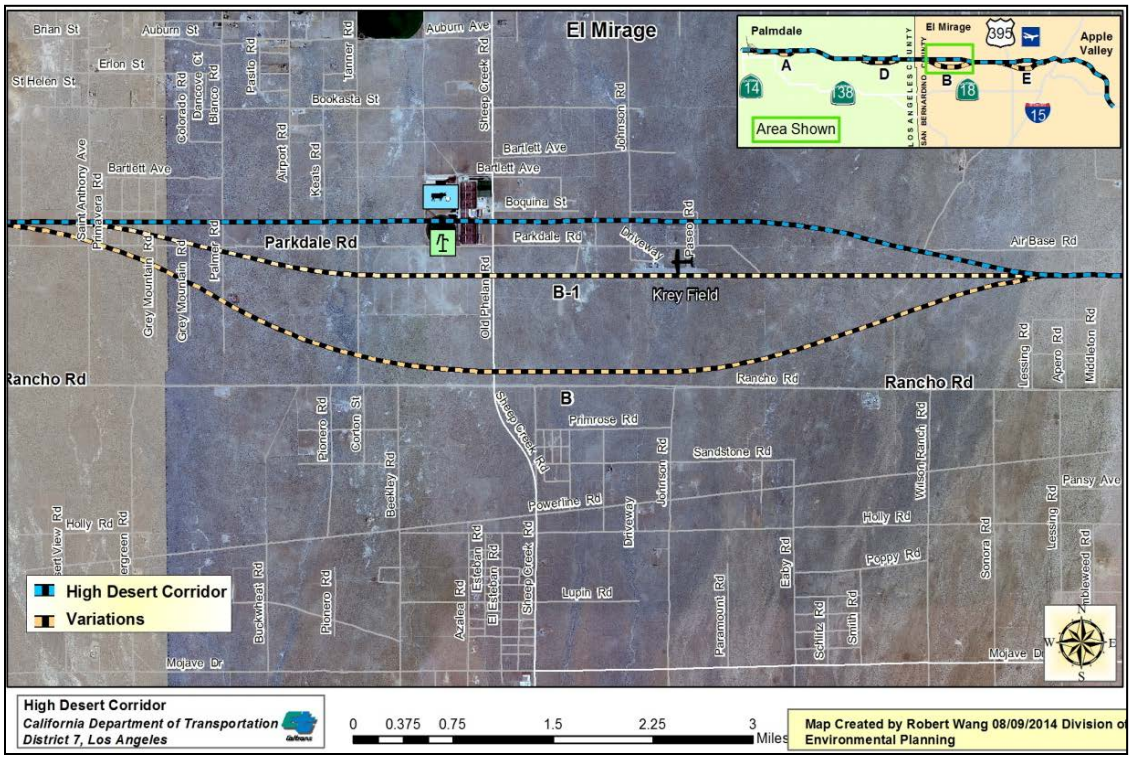



## 2.3.2 Variation B and Variation B1

East of the Los Angeles/San Bernardino county line, this segment of freeway/ expressway would run slightly south of the main alignment by approximately 0.7 mile between Oasis Road and Caughlin Road. Variation B would have a linear pavement distance of approximately 9.4 miles, while the corresponding segment of the main alignment is approximately 9.2 miles. This alignment variation was introduced to avoid affecting the Meadowbrook Dairy facility and its associated agricultural plots and dairy cattle holding pens. ROW required would be a 500-foot corridor for this portion. Figure 2-17 shows the Variation B alignment.

Another option for Variation B is called Variation B1. It is located east of the county line. This segment would avoid the former dairy facility, just as Variation B would, and would run slightly south of the main alignment by approximately 0.4 mile. This alignment is shorter in length (linear distance of 9.18 miles) but introduces an alignment conflict with Krey Airfield and would require property acquisition from the airfield. Figure 2-17 shows the Variation B1 alignment.

**Figure 2-17 Variation B and Variation B1 Alignments**



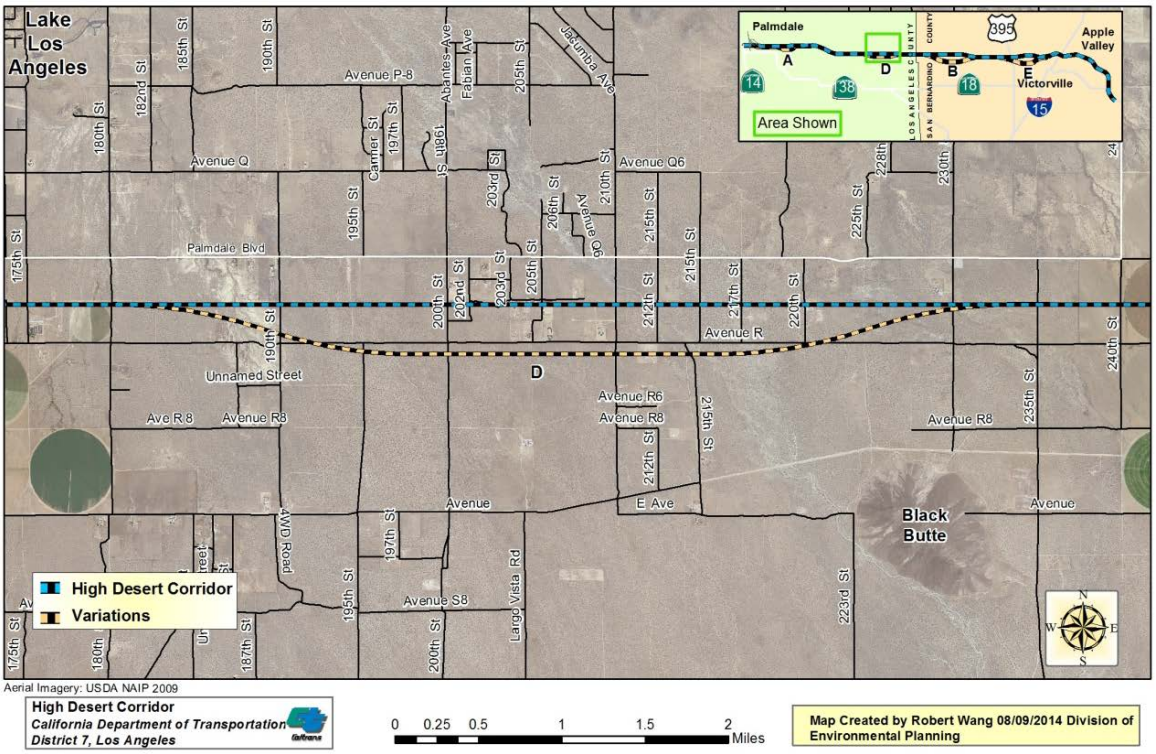

## 2.3.3 Variation D

Near Lake Los Angeles, the freeway/expressway would run slightly south of the main alignment along Avenue R by approximately 1,500 feet, from approximately 190th Street East to 230th Street East. The main alignment segment of Variation D, which is parallel, is 6.18 miles long, while the Variation D segment itself has a linear distance of approximately 6.22 miles. The alignment shift would reduce the amount of community (i.e., residential) impacts. ROW required would be a 500-foot corridor. Figure 2-18 shows the Variation D alignment.

## 2.3.4 Variation E

Near Southern California Logistics Airport (SCLA), this freeway/expressway segment, which is approximately 8 miles in length, would run south of the main alignment to avoid the Victorville Federal Correctional Facility, just south of Rancho Road. It was introduced to avoid potential ROW constraints between the SCLA and correctional facilities under the Freeway/Expressway and Freeway/Tollway alternatives, saving approximately 67 single family homes. However, under the alternatives with HSR, these residential homes would still be affected. This variation also presents an inconsistency with the land use zoning designation for the SCLA Specific Plan and with Victorville's General Plan. However, it would avoid potential impacts to cultural resources located along the main alignment near Turner Wash. The ROW required for this segment of the corridor would be 500 feet. Figure 2-19 shows the Variation E alignment.

## Figure 2-18 Variation D Alignment




## Figure 2-19 Variation E Alignment

## 2.4 Common Design Features of Build Alternatives

Design standards from the Caltrans Highway Design Manual (HDM, Sixth Edition) were applied to the HDC Project for roadway geometric criteria and standard design features. In addition, design standards from the Surface Transportation Assistance Act of 1982 (STAA) National Network for large trucks were applied. Caltrans design standards require that the minimum interchange spacing shall be 1 mile in urban areas, 2 miles in rural areas, and 2 miles between system interchanges and service interchanges.

### 2.4.1 Typical Sections

The HDC Project consists of the construction of a highway facility and the associated acquisition/preservation of ROW. Therefore, each alternative is defined by an ultimate cross section to be accommodated within the ROW. The following elements are included in the design concept for the ultimate facility:

- Mixed-flow lanes in each direction for the build alternatives
- Shoulders designed to Caltrans standards for freeways
- Medians designed to Caltrans standards for freeways

The typical sections for the HDC build alternatives range from four lanes per direction in the Palmdale area of Los Angeles County (500 feet wide) to two lanes per direction in the Apple Valley expressway portion of the corridor in San Bernardino County (300 feet wide). The traffic analysis to determine the required typical section (i.e., number of travel lanes required) was based on the *High Desert Corridor Traffic Study* (June 2014).

The alternatives being analyzed include sufficient ROW to accommodate a multimodal transportation facility that includes highway lanes, HSR Feeder Service between Palmdale and Victorville, green energy facilities, and a bike path.

For the rail component, the alignment would run generally in the center of the highway for most of the HDC. Additional ROW would be required for the connection to the proposed Palmdale Station area and the Victorville Station.

In general, the needed ROW varies from approximately 290 to 500 feet in width. Figures 2-20 and 2-21 show typical sections for the HDC mainlines. The alternatives may require ROW that varies in width as a result of topography (i.e., terrain) requiring cut (i.e., excavation) and fill, features of the natural (i.e., buttes, hills, mountains, washes, creeks, streams) and built environment, and design requirements (e.g., larger turning radius for HSR). Therefore, variations in these cross sections are needed in constrained areas.

**Figure 2-20 Future Ultimate Freeway/Expressway Alternatives Typical Section**

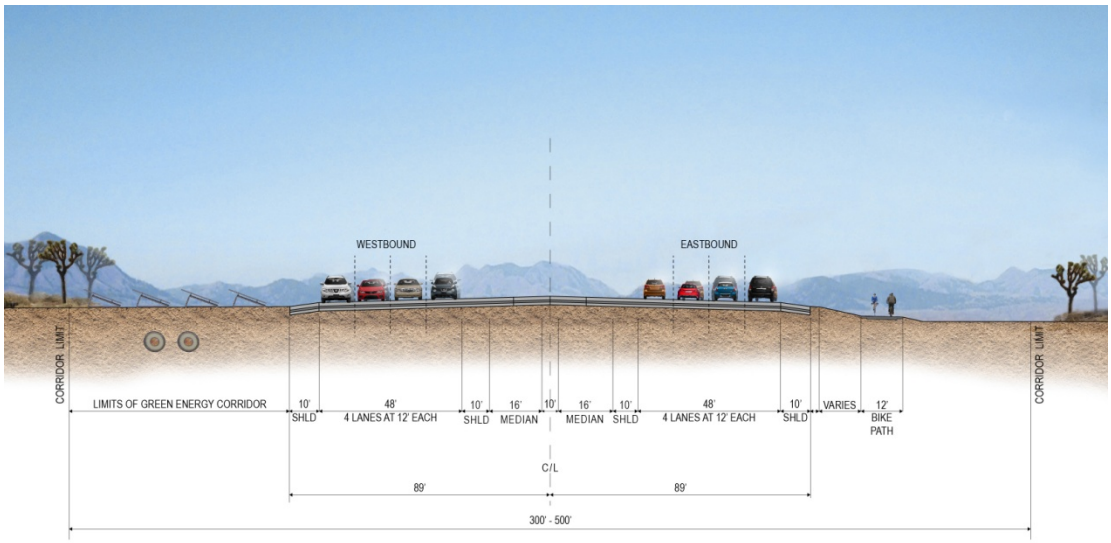
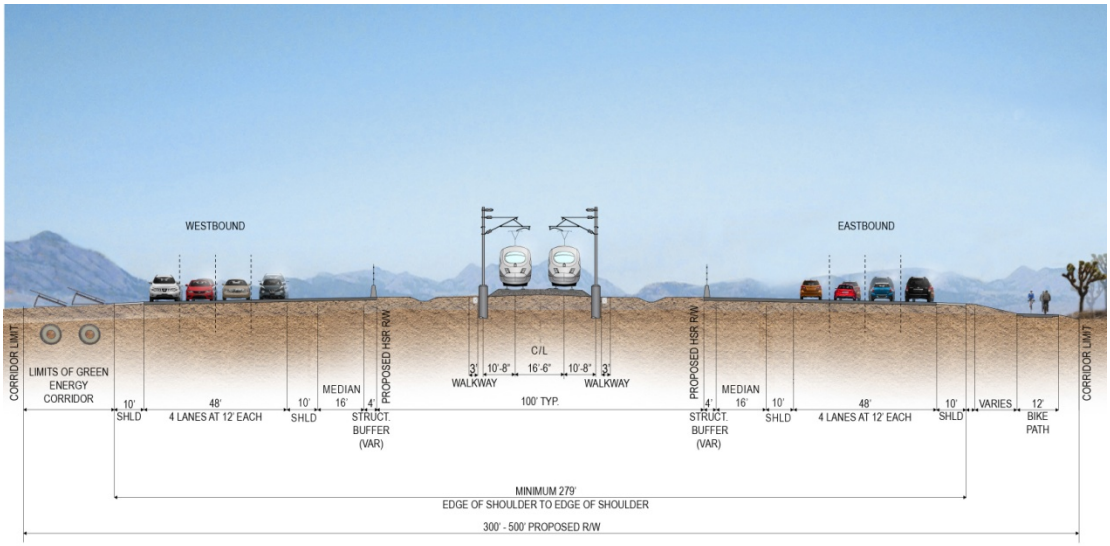



**Figure 2-21 Future Ultimate Freeway/High-Speed Rail Alternative Typical Section**




## 2.4.2 Lane Configuration

The typical lane configuration for the HDC highway facility varies between two lanes in each direction to four lanes. The lane configurations are based on the traffic study forecasts and are described below by segments.

### *4-Lanes Westbound/4-Lanes Eastbound Freeway*

This segment is located within Palmdale (Los Angeles County) and extends from SR-14 to 50$^{th}$ Street East for approximately 5 miles. The project would construct a grade-separated freeway providing four mixed-flow travel lanes along each direction

of the HDC, including connector ramps to and from SR-14. Auxiliary lanes would be provided where needed to accommodate traffic weaving and merging maneuvers. In addition to the eight 12-foot-wide mixed-flow lanes, 10-foot-wide shoulders would also be provided on both sides of the mainline travel lanes.

#### *3-Lanes Westbound/3-Lanes Eastbound Freeway*

This next segment extends from Palmdale (Los Angeles County) to Apple Valley (San Bernardino County) for approximately 48 miles. The project would construct a grade-separated freeway and add three mixed-flow travel lanes along each direction of the HDC from 50$^{th}$ Street East to Dale Evans Parkway, approximately 3 miles east of I-15. In addition to the six 12-foot-wide mixed-flow lanes, 10-foot-wide shoulders would also be provided on both sides of the mainline travel lanes.

#### *2-Lanes Westbound/2-Lanes Eastbound Expressway*

The final segment would be constructed at grade as an expressway for approximately 10 miles, extending from Dale Evans Parkway in Apple Valley (San Bernardino County) to SR-18 (Happy Trails Highway), just east (south) of Standing Rock Road near its junction with Bear Valley Road. In addition to the four 12-foot-wide mixed-flow lanes, 10-foot-wide shoulders would also be provided on both sides of the expressway through travel lanes.

High-occupancy vehicle (HOV)/carpool lanes would not be part of this project; however, ROW would be reserved for their potential addition at a later date. Instead, toll lanes would be proposed for the mid section from 100th Street East in Palmdale to US 395 in Adelanto.

### 2.4.3 Interchanges

The HDC build alternatives would include interchanges at SR-14 and I-15, and at major arterials in the study area to facilitate travel to and from the HDC, SR-14, US 395, National Trails Highway, SR-18, and area arterials. There are two kinds of interchanges associated with the HDC build alternatives – system interchanges and service interchanges:

- System Interchange – A system interchange is a major freeway-to-freeway interchange that carries traffic from one freeway to another via a network of ramps and connectors. The project calls for two system interchanges: at the HDC and SR-14 and the HDC and I-15. The HDC/I-15 interchange location would be a four-level interchange.
- Service Interchange – A service interchange connects a freeway with local surface streets or arterials. Service interchange locations will be coordinated with the Cities of Palmdale, Adelanto, Victorville, and Apple Valley, and the County of Los Angeles and San Bernardino General Plan Circulation Elements.

The build alternatives would also include interchange modifications and improvements as discussed below.

### SR-14 Interchange Additions and Modifications

The western terminus of the HDC would have a series of interchanges providing direct connection with SR-14. At their highest points, these interchanges would gradually rise to approximately three to four stories tall. A partial interchange at Avenue P (Rancho Vista Boulevard) on SR-14 would be removed, and a full interchange at 10th Street West would be constructed to provide sufficient merging distance for the two freeways. Several existing ramps along SR-14 would be realigned to accommodate the SR-14 widening between 10th Street West and Palmdale Boulevard. Palmdale Boulevard interchange ramps would be realigned as listed below:

- Southbound SR-14 to Westbound Palmdale Boulevard
- Westbound Palmdale Boulevard to Southbound SR-14
- Westbound Palmdale Boulevard to Northbound SR-14
- Eastbound Palmdale Boulevard to Southbound SR-14
- Eastbound Palmdale Boulevard to Northbound SR-14

In addition, the on-ramp from westbound Palmdale Boulevard to northbound SR-14 would be modified to provide a direct connection to the eastbound HDC.

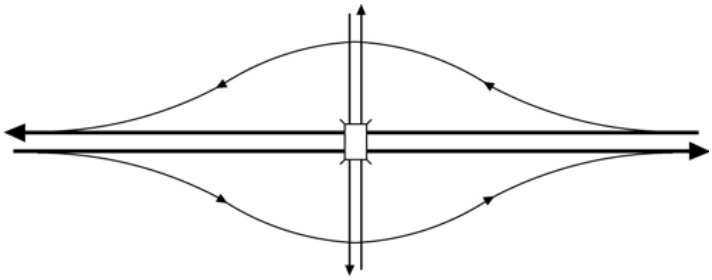
### I-15 Interchange Additions

Similar to the HDC system interchange with SR-14, there would be eight ramps, three to four stories tall at their highest points, connecting the HDC with I-15. The interchange would be located approximately midway between the existing service interchanges of I-15 with Stoddard Wells Road north, and Stoddard Wells Road south. Viaduct/bridge structure(s) would be constructed over the Burlington Northern Santa Fe (BNSF) Railway and the Mojave Northern Railroad tracks, and the Mojave River, all to the west of I-15.

### Service Interchange (Local Access Locations)

The HDC would include local access service interchanges at intervals of 1 to 5 miles between SR-14 and approximately 3 miles east of I-15, where the freeway transitions to an expressway. For the most part, the local service interchanges would be designed as “spread diamonds,” where the ramps flare away from the freeway mainline because of certain design advantages, such as flatter ramp conditions, which improve sight and stopping distance, greater crossroads storage capacity for vehicles making left turns, and the flexibility for future ramp expansion to add loop ramps. Figure 2-22 illustrates the conceptual configuration of a spread diamond interchange.

**Figure 2-22 Spread Diamond Interchange Configuration**



*Source: Caltrans Highway Design Manual, 2012.*

In general, highway interchange spacing policy establishes a minimum spacing requirement of 1-mile separation between each interchange for urban areas and 2-mile separation in rural areas. For the proposed HDC interchanges, the distance between interchanges would vary from a minimum of 1 mile to 5 miles. Interchanges proposed for the freeway/tollway portion of all build alternatives of the HDC are summarized below and illustrated in Figure 2-23.

*Los Angeles County*

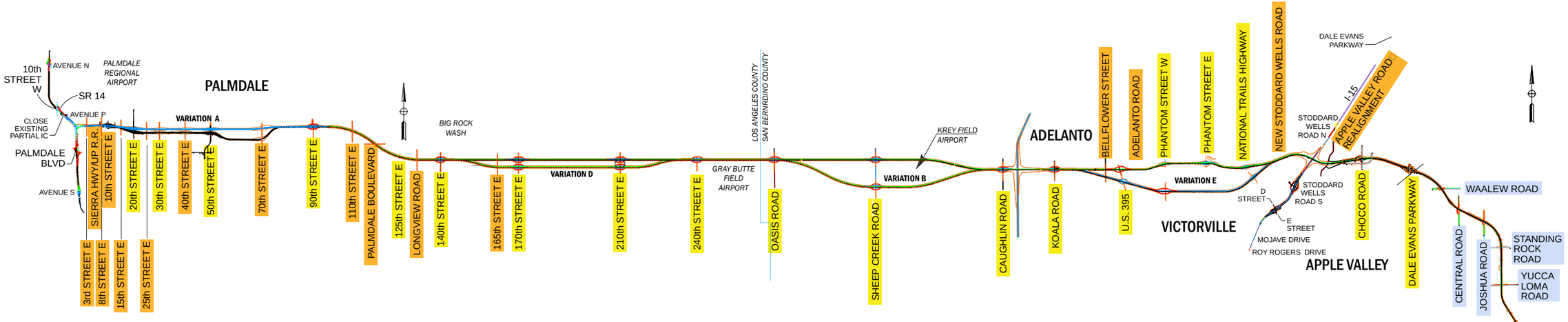
- SR-14
- 20th Street East
- 30th Street East
- 50th Street East
- 90th Street East
- Longview Road/140th Street East
- 170th Street East
- 210th Street East
- 240th Street East

*San Bernardino County*

- Oasis Road
- Sheep Creek Road
- Caughlin Road
- Koala Road
- US 395
- Phantom Road West
- Phantom Road East
- National Trails Highway
- Dale Evans Parkway

Ramp meters could be installed at ramps where there is sufficient vehicular traffic to warrant the management of on-ramp access.

**Figure 2-23 Proposed Locations of Interchanges, Grade Separations and At-grade Intersections along the High Desert Corridor**



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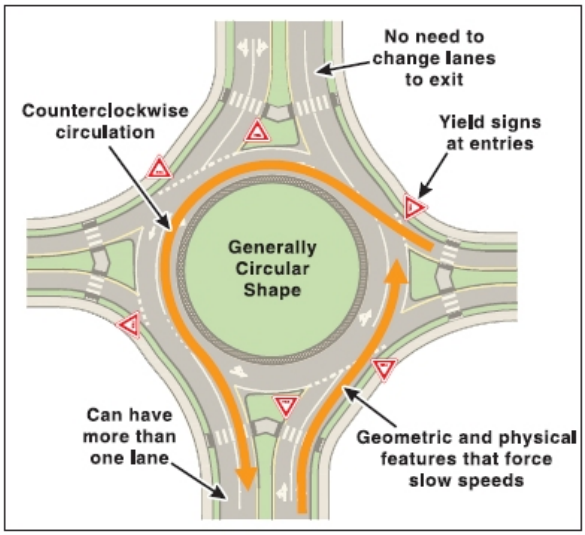
At the ramp intersections in Los Angeles and San Bernardino counties where freeway traffic meets local streets, ROW would be reserved for roundabouts that could be built at a future date. Figure 2-24 illustrates the conceptual configuration of a roundabout that could be constructed at the junction of the interchange on-/off-ramps with the local service road. The locations where future roundabouts could be built are:

- Longview Road/140th Street
- 170th Street
- 210th Street
- 240th Street
- Oasis Road
- Sheep Creek Road
- Caughlin Road
- Koala Road
- Choco Road

**Figure 2-24 Sample Roundabout Configuration**




### *Grade Separations*

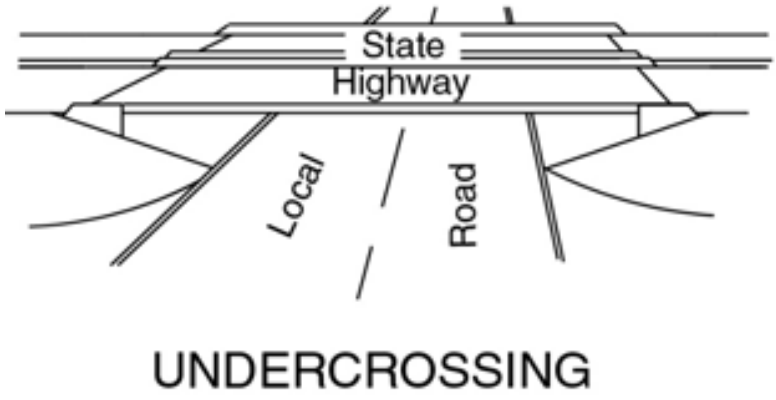
Grade separations facilitate the movement of traffic while minimizing conflict at intersections by providing crossings. These crossings may consist of any combination of the following: two highways, a highway and a local road, or a highway and a railroad that are physically isolated from each other via a structure. Grade separations proposed as freeway undercrossings (i.e., structures) are listed below:

*Los Angeles County*
- 3rd Street East
- Sierra Highway/Union Pacific Railroad
- 8th Street East
- 15th Street East
- 25th Street East
- 30th Street East
- 40th Street East
- 70th Street East
- 110th Street East
- Palmdale Boulevard
- 165th Street East

*San Bernardino County*
- Bellflower Street
- Adelanto Road
- Stoddard Wells Road
- Apple Valley Road (Realignment)

There would be no at-grade intersections in Los Angeles County or San Bernardino County between SR-14 in Palmdale and Dale Evans Parkway in Apple Valley. Figure 2-25 illustrates a typical configuration for a freeway undercrossing.

**Figure 2-25 State Highway Undercrossing Configuration**




*Source: Caltrans Highway Design Manual.*

### 2.4.4 Bridges and Culverts

Bridges would be provided at major crossings of water resources, natural resources, local roads, and railroads to provide access over the HDC Project for vehicle, pedestrian, bicycle, equestrian, and wildlife uses. A combination of bridges and culverts is proposed in many areas to minimize or avoid impacts to water resources. Bridges are also provided to minimize or reduce ROW acquisitions in developed areas and minimize impacts to cultural resources by avoiding construction in the areas that have the potential to encounter them. All bridges will be designed to Caltrans

standards. The bridges have been categorized as Water and Natural Resources, Local Roads, Wildlife Crossings, and Other Crossings.

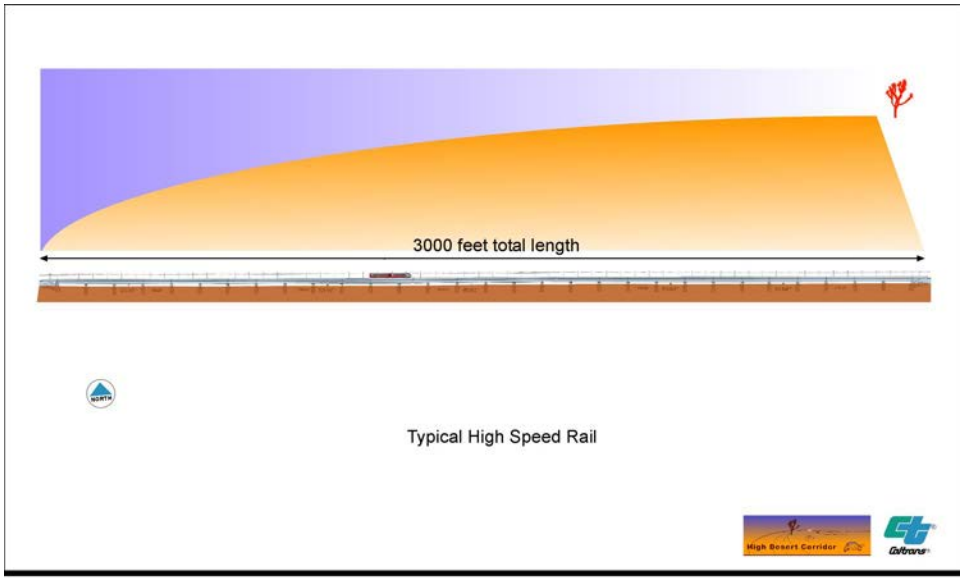
The bridge cross sections would be consistent with the road cross sections on either side of the bridge. For instance, if a bridge were to cross a road segment with four mixed-use lanes (e.g., cars, trucks, motorcycles), then the bridge structure cross section would also provide four mixed-use lanes. The cross sections on bridges would also match the HDC Project cross sections or the General Plan local circulation element facility when possible for local arterial roads crossing the HDC Project.

### *Bridges for Water*

The HDC build alternatives include bridge structures crossing water at the following locations:

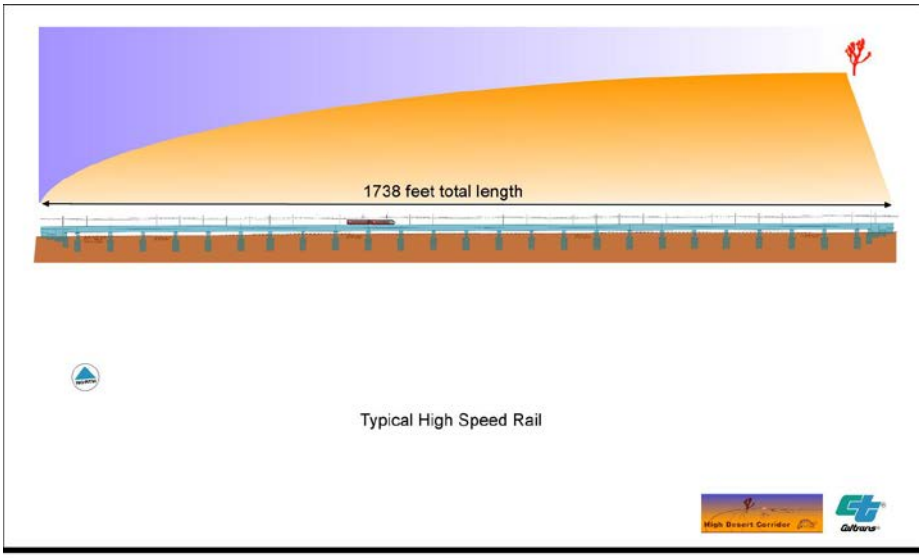
- Little Rock Wash (see graphic showing bridge section in Figure 2-26)
- Big Rock Wash (see graphic showing bridge section in Figure 2-27)
- Turner Wash (see graphic showing bridge section in Figure 2-28)
- Ossam Wash (see graphic showing bridge section in Figure 2-29)
- Mojave River (see graphic showing bridge section in Figure 2-30)

**Figure 2-26 Little Rock Wash Bridge Section (Conceptual)**



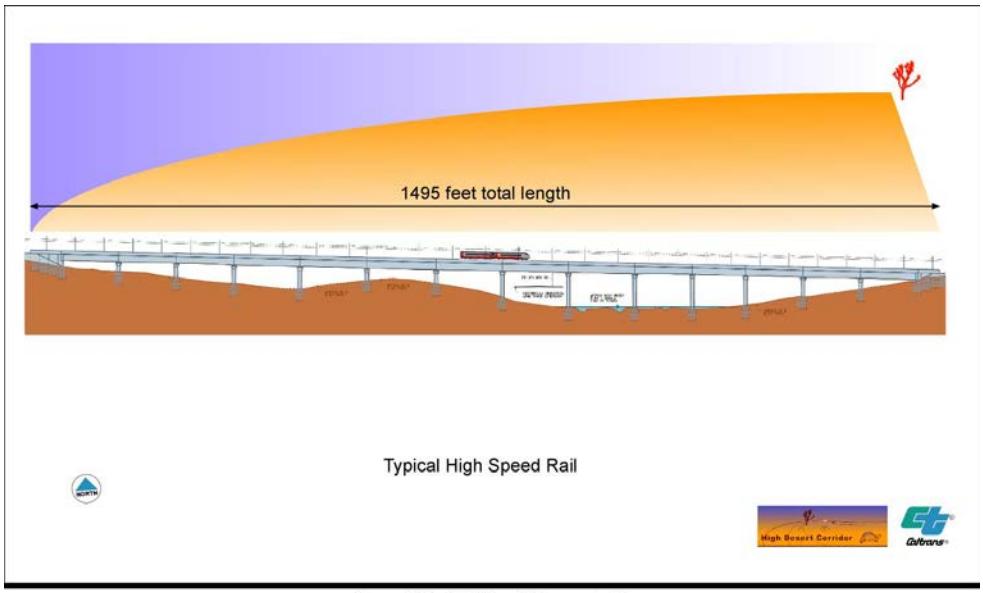

Little Rock Creek Bridge (Conceptual)

**Figure 2-27 Big Rock Wash Bridge Section (Conceptual)**



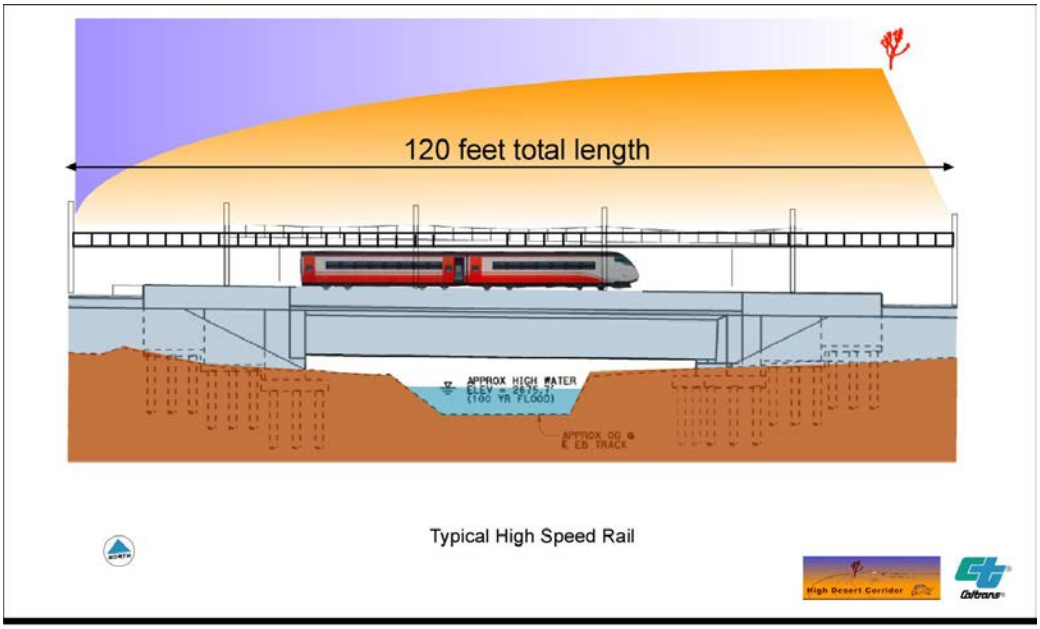

Big Rock Wash Bridge (Conceptual)

**Figure 2-28 Turner Wash Bridge Section (Conceptual)**



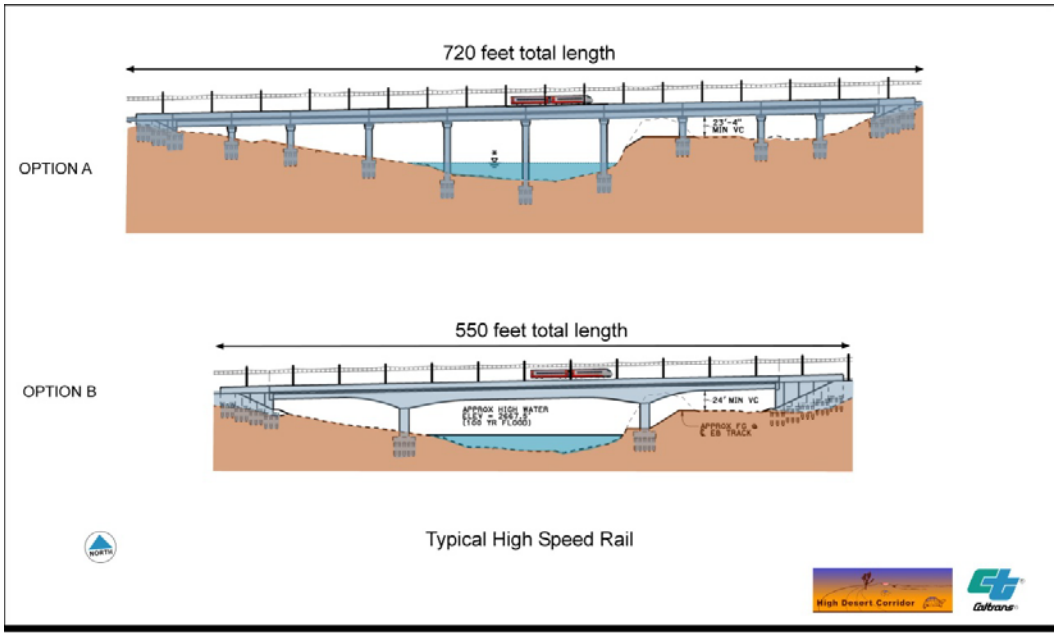

Turner Wash Bridge (Conceptual)

## Figure 2-29 Ossam Wash Bridge Section (Conceptual)




Ossam Wash Bridge (Conceptual)

## Figure 2-30 Mojave River Bridge Section (Conceptual)




Mojave Bridge (Conceptual)

### *Bridges for Local Road Crossings*

The HDC build alternatives would include many overcrossings of local roads to allow the HDC Project to pass over those roads without disruption to through traffic on the HDC Project or the local roads. Section 2.4.1.3 lists the locations along the HDC build alternatives where interchanges and grade separation overcrossings are proposed to span local roads. All of these overcrossings are relatively short to allow the local roads to pass under the HDC roadway and HSR track alignments. Typically, single- or dual-span bridges would be constructed with span lengths of 100 feet or less. One overcrossing at Phantom Road East is considerably longer to accommodate topographic conditions.

### *Culverts for Wildlife Crossings*

The HDC build alternatives would include dual-purpose culverts. At some locations, the culverts would function as a crossing for water only, while at other locations they would function as a crossing for water and a passage for wildlife. These wildlife crossing culverts are intended to link habitat that would otherwise be separated by the HDC. Those locations selected for the dual-purpose culvert would be modified (i.e., higher and wider culverts) to accommodate wildlife and encourage wildlife to use these culverts. The locations to function as dual-purpose culverts were determined by a Wildlife Movement Study (Preliminary Wildlife Corridor Evaluation, September 23, 2011). Typical culverts would consist of either corrugated steel (i.e., elliptical or circular), articulated interlocking concrete blocks, or concrete box-like structures that would be filled with sand and gravel to mimic a natural earthen bottom and may contain concrete ledges in some locations. Refer to Figures 2-31, 2-32, and 2-33 for locations of wildlife crossings on the HDC, which are shown in grey arrows. The design change would be required for these areas.

**Figure 2-31 High Desert Corridor Wildlife Crossings in Los Angeles County (Palmdale to Lake Los Angeles)**

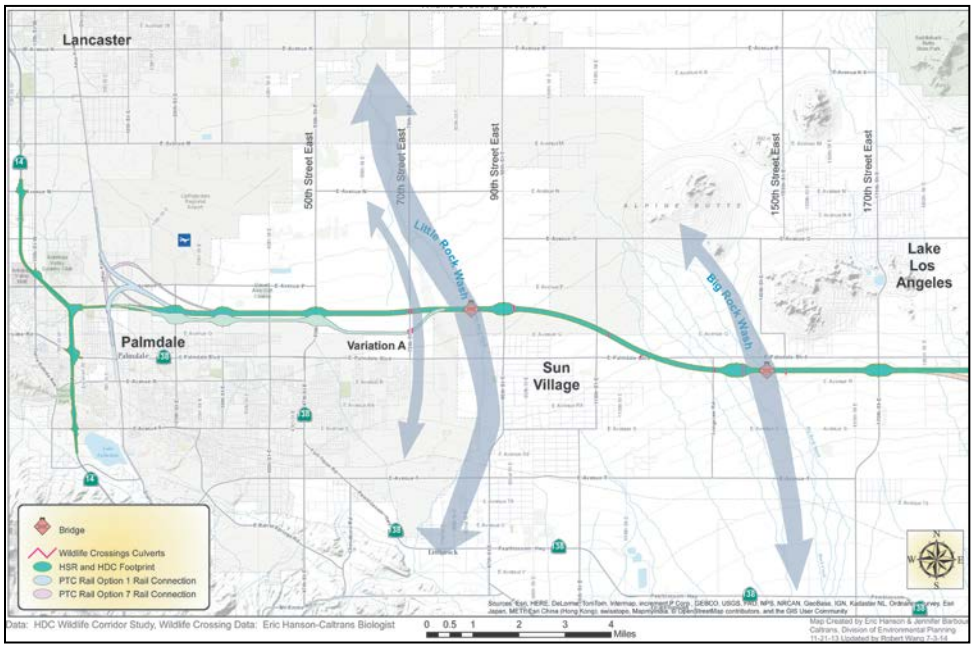


**Figure 2-32 High Desert Corridor Wildlife Crossings from 170th Street (Los Angeles County) to Lessing Avenue (San Bernardino County)**

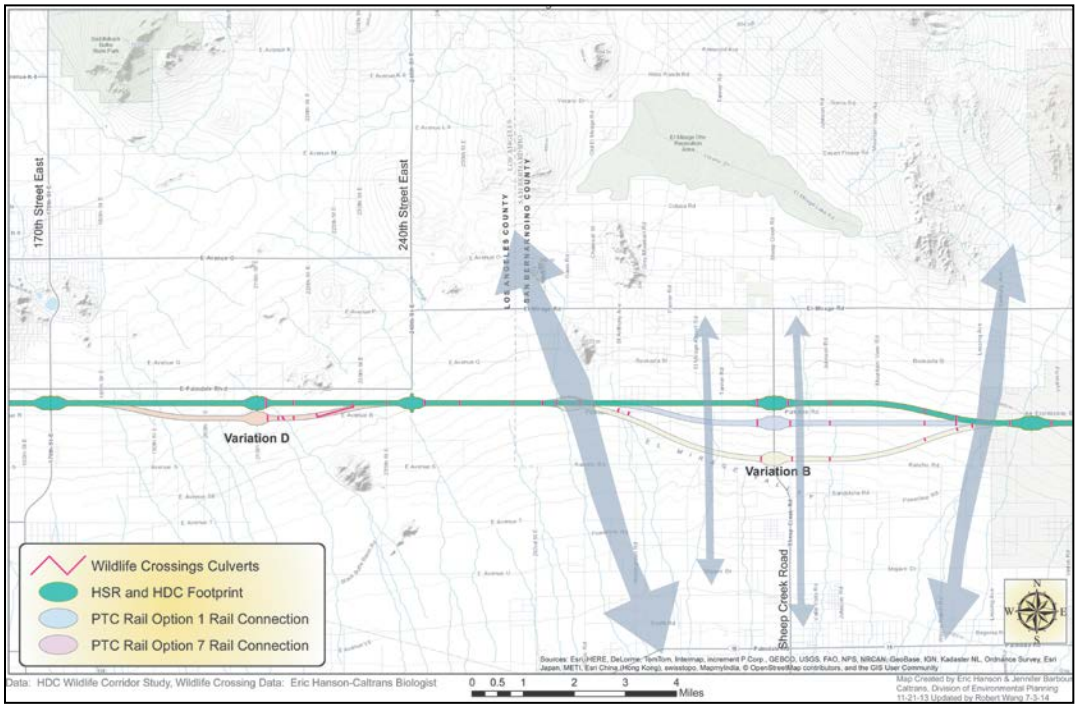
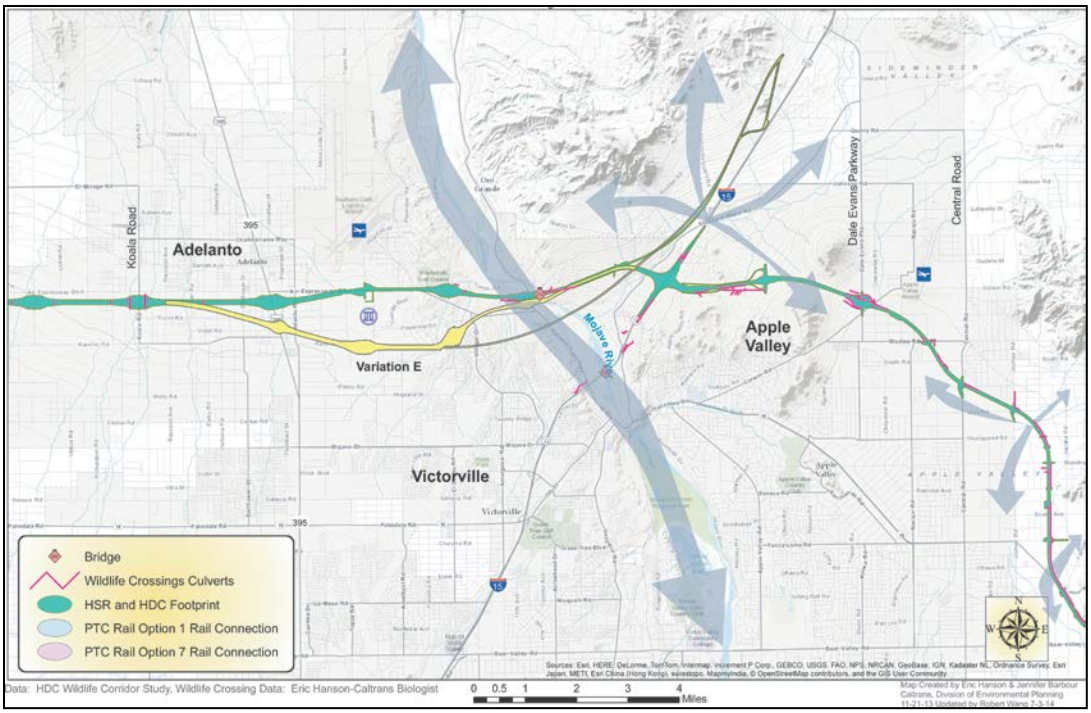



**Figure 2-33 High Desert Corridor Wildlife Crossings in San Bernardino County**



### *Soft Bottom Concrete Culverts*

The design for a soft bottom concrete culvert would allow a small amount of silt buildup in the culvert floor or would be filled with a layer of sand or silt, in most cases about 1 foot. The minimum height for each culvert is 3 feet. This ensures the maintainability of culverts should silt buildup occur, while still allowing small wildlife to cross under the HDC alignment. At other locations, certain culverts were increased in height to 5 and 6 feet to allow larger wildlife to cross beneath the HDC.

Table 2-1 provides the list of culverts to be constructed for widelife crossing purposes within the project corridor.

**Table 2-1 High Desert Corridor Wildlife Crossings**

| Culvert # | Station | Description | Soft Bottom |
|---|---|---|---|
| 1 | 270+75 | 4 - 7' x 3' RCB | N |
| 2 | 287+60 | 3 - 7' x 3' RCB | N |
| 3 | 329+40 | 4 - 7' x 3' RCB | N |
| 4 | 330+90 | 4 - 7' x 3' RCB | N |
| 5 | 348+00 | 4 - 7' x 3' RCB | N |
| 6 | 352+50 | 4 - 7' x 3' RCB | N |
| 7 | 365+00 | 4 - 7' x 3' RCB | N |
| 8 | 383+50 | 7 - 7' x 3' RCB | N |
| 9 | 385+00 | 4 - 7' x 3' RCB | N |
| 10 | 399+40 | 4 - 7' x 3' RCB | N |
| 11 | 403+00 | 4 - 7' x 3' RCB | N |
| 12 | 420+80 | 4 - 7' x 3' RCB | N |
| 13 | 439+20 | 3 - 7' x 3' RCB | N |
| 14 | 456+50 | 4 - 10' x 6' RCB | N |
| 15 | 473+20 | 1 - 7' x 3' RCB | N |
| 16 | 507+80 | 1 - 7' x 3' RCB | N |
| 17 | 519+20 | 1 - 7' x 3' RCB | N |
| 18 | 532+50 | 1 - 7' x 3' RCB | N |
| 19 | 570+33 | 4 - 7' x 3' RCB | N |
| 20 | 573+35 | 4 - 7' x 3' RCB | N |
| 21 | 691+00 | 5 - 10' x 5' RCB | N |
| 22 | 694+00 | 5 - 10' x 5' RCB | N |
| 23 | 696+60 | 5 - 10' x 5' RCB | N |
| 24 | 699+20 | 5 - 10' x 5' RCB | N |
| 25 | 701+80 | 5 - 10' x 5' RCB | N |
| 26 | 704+40 | 5 - 10' x 5' RCB | Y |
| 27 | 707+00 | 5 - 10' x 5' RCB | Y |
| 28 | 710+00 | 4 - 7' x 3' RCB | Y |
| 29 | 717+00 | 4 - 7' x 3' RCB | N |

## Table 2-1 High Desert Corridor Wildlife Crossings

| Culvert # | Station | Description | Soft Bottom |
|---|---|---|---|
| 30 | 722+00 | 4 - 7' x 3' RCB | N |
| 31 | 727+50 | 1 - 10' x 5' RCB | Y |
| 32 | 762+00 | 2 - 10' x 5' RCB | Y |
| 33 | 771+99 | 5 - 7' x 3' RCB | N |
| 34 | 782+00 | 5 - 7' x 3' RCB | Y |
| 35 | 805+80 | 1 - 10' x 5' RCB | Y |
| 36 | 850+00 | 1 - 10' x 5' RCB | Y |
| 37 | 907+00 | 1 - 10' x 5' RCB | Y |
| 38 | 925+00 | 1 - 10' x 5' RCB | Y |
| 39 | 937+00 | 2 - 7' x 3' RCB | Y |
| 40 | 970+04 | 3 - 7' x 3' RCB | Y |
| 41 | 1019+00 | 1 - 7' x 3' RCB | Y |
| 42 | 1052+00 | 1 - 10' x 5' RCB | Y |
| 43 | 1072+00 | 1 - 10' x 5' RCB | Y |
| 44 | 1099+00 | 1 - 7' x 3' RCB | Y |
| 45 | 1115+03 | 1 - 10' x 5' RCB | Y |
| 46 | 1150+04 | 2 - 8' x 6' RCB | Y |
| 47 | 1162+61 | 3 - 10' x 8' RCB | Y |
| 48 | 1172+11 | 3 - 10' x 8' RCB | Y |
| 49 | 1180+12 | 2 - 8' x 6' RCB | Y |
| 50 | 1191+09 | 3 - 8' x 6' RCB | Y |
| 51 | 1196+09 | 3 - 8' x 6' RCB | N |
| 52 | 1204+00 | 1 - 8' x 6' RCB | Y |
| 53 | 1218+05 | 2 - 8' x 6' RCB | Y |
| 54 | 1224+04 | 2 - 8' x 6' RCB | N |
| 55 | 1229+05 | 3 - 8' x 6' RCB | Y |
| 56 | 1276+00 | 1 - 6' x 6' RCB | Y |
| 57 | 1288+00 | 1 - 6' x 4' RCB | Y |
| 58 | 1300+00 | 1 - 6' x 6' RCB | Y |
| 59 | 1321+00 | 1 - 7' x 3' RCB | Y |
| 60 | 1351+00 | 1 - 7' x 3' RCB | Y |
| 61 | 1362+05 | 2 - 10' x 6' RCB | N |
| 62 | 1367+22 | 3 - 10' x 8' RCB | Y |
| 63 | 1378+04 | 3 - 8' x 6' RCB | Y |
| 64 | 1388+04 | 3 - 8' x 6' RCB | Y |
| 65 | 1402+00 | 1 - 7' x 3' RCB | Y |
| 66 | 1441+00 | 1 - 6' x 6' RCB | Y |
| 67 | 1476+00 | 1 - 6' x 6' RCB | Y |

## Table 2-1 High Desert Corridor Wildlife Crossings

| Culvert # | Station | Description | Soft Bottom |
|---|---|---|---|
| 68 | 1515+02 | 2 - 7' x 3' RCB | Y |
| 69 | 1551+04 | 2 - 8' x 6' RCB | Y |
| 70 | 1575+04 | 2 - 8' x 6' RCB | Y |
| 71 | 1606+11 | 3 - 10' x 8' RCB | Y |
| 72 | 1619+05 | 2 - 10' x 6' RCB | Y |
| 73 | 1629+05 | 2 - 10' x 6' RCB | Y |
| 74 | 1637+11 | 4 - 10' x 6' RCB | Y |
| 75 | 1651+08 | 3 - 8' x 6' RCB | Y |
| 76 | 1675+05 | 4 - 8' x 4' RCB | Y |
| 77 | 1690+05 | 2 - 10' x 8' RCB | Y |
| 78 | 1698+05 | 2 - 10' x 8' RCB | Y |
| 79 | 1716+05 | 2 - 10' x 8' RCB | Y |
| 80 | 1727+05 | 2 - 10' x 8' RCB | Y |
| 81 | 1756+00 | 1 - 8' x 6' RCB | Y |
| 82 | 1791+00 | 1 - 8' x 6' RCB | Y |
| 83 | 1873+00 | 1 - 8' x 6' RCB | Y |
| 84 | 1905+00 | 1 - 8' x 6' RCB | Y |
| 85 | 1944+00 | 2 - 8' x 6' RCP | Y |
| 86 | 1958+00 | 2 - 7' x 3' RCB | Y |
| 87 | 1981+04 | 1 - 8' x 6' RCB | Y |
| 88 | 2045+00 | 1 - 6' x 6' RCB | Y |
| 89 | 2080+00 | 1 - 8' x 6' RCB | Y |
| 90 | 2096+05 | 2 - 10' x 6' RCB | Y |
| 91 | 2116+05 | 3 - 10' x 6' RCB | Y |
| 92 | 2135+05 | 3 - 8' x 4' RCB | Y |
| 93 | 2148+00 | 2 - 10' x 6' RCB | Y |
| 94 | 2167+00 | 2 - 10' x 6' RCB | Y |
| 95 | 2178+00 | 1 - 8' x 4' RCB | Y |
| 96 | 2236+00 | 1 - 6' x 6' RCB | Y |
| 97 | 2256+11 | 7 - 10' x 8' RCB | Y |
| 98 | 2271+40 | 6 - 10' x 8' RCB | Y |
| 99 | 2284+11 | 4 - 10' x 8' RCB | Y |
| 100 | 2292+17 | 4 - 10' x 8' RCB | Y |
| 101 | 2321+47 | 1 - 7' x 3' RCB | Y |
| 102 | 2325+68 | 1 - 5' x 3' RCB | N |
| 103 | 2331+28 | 1 - 8' x 6' RCB | Y |
| 104 | 2349+00 | 1 - 7' x 3' RCB | Y |
| 105 | 2414+00 | 1 - 8' x 6' RCB | Y |

## Table 2-1 High Desert Corridor Wildlife Crossings

| Culvert # | Station | Description | Soft Bottom |
|---|---|---|---|
| 106 | 2465+26 | 5 - 8' x 6' RCB | Y |
| 107 | 2472+79 | 5 - 8' x 6' RCB | Y |
| 108 | 2562+23 | 1 - 7' x 3' RCB | Y |
| 109 | 2792+17 | 9 - 12' x 8' RCB | Y |
| 110 | 2899+09 | 5 - 10' x 5' RCB | Y |
| 111 | 3036+14 | 3 - 10' x 5' RCB | Y |
| 112 | 3051+70 | 2 - 10' x 6' RCB | Y |
| 113 | 3111+69 | 4 - 7' x 3' RCB | N |
| 114 | 3138+26 | 4 - 7' x 3' RCB | Y |
| 115 | 3149+59 | 4 - 7' x 3' RCB | Y |
| 116 | 3163+47 | 4 - 7' x 3' RCB | Y |
| 117 | 3180+89 | 4 - 7' x 3' RCB | Y |
| 118 | 3190+27 | 4 - 7' x 3' RCB | Y |
| 119 | 3197+82 | 4 - 7' x 3' RCB | N |
| 120 | 3207+17 | 4 - 7' x 3' RCB | N |
| 121 | 3224+32 | 4 - 7' x 3' RCB | N |
| 122 | 3240+97 | 4 - 7' x 3' RCB | Y |
| 123 | 3260+40 | 4 - 7' x 3' RCB | Y |
| 124 | 3271+71 | 4 - 7' x 3' RCB | Y |
| 125 | 3285+51 | 3 - 7' x 3' RCB | Y |
| 126 | 3296+99 | 3 - 7' x 3' RCB | Y |
| 127 | 3314+16 | 3 - 7' x 3' RCB | Y |
| 128 | 3327+31 | 3 - 7' x 3' RCB | Y |
| 129 | 3333+51 | 3 - 7' x 3' RCB | Y |
| 130 | 3393+17 | 3 - 7' x 3' RCB | Y |
| 131 | 3423+54 | 3 - 7' x 3' RCB | Y |
| 132 | 3450+74 | 3 - 7' x 3' RCB | Y |
| RCB: Reinforce concrete block | | | |

*Source: HDC Natural Environment Study Report, 2014*

### *Bridges for Other Crossings*

The HDC build alternatives would include many crossings (e.g., crossing of railroads, direct connectors at the system interchanges). System interchange direct connectors are at the HDC and SR-14 interchange in Palmdale (Los Angeles County) and HDC and I-15 interchange in Victorville/Apple Valley (San Bernardino County). These connectors are structures that could range in length from 1,312 to 5,908 feet.

### 2.4.5 High-Occupancy Vehicle Lanes and Park-and-Ride Facilities

No HOV lanes or park-and-ride facilities are proposed as part of the HDC build alternatives. In lieu of carpool lanes, a tollway is proposed from 100th Street East in Palmdale to US 395 in Adelanto.

Park-and-ride facilities are not proposed as part of this project; however, local jurisdictions, along with regional transportation agencies, may choose to add additional park-and-ride lots to supplement the existing ones at a later date. In addition, recent legislation, Senate Bill (SB) 415 allows Caltrans, through the California Transportation Commission (CTC), to relinquish existing park-and-ride facilities to the local jurisdiction and the regional transportation agency. This gives the local jurisdiction more flexibility in operation and maintenance of existing State-owned park-and-ride lots, allowing for possible expansion.

There are five existing park-and-ride lots within Los Angeles and San Bernardino counties near the HDC build alternatives (see Section 3.1.6, Traffic and Transportation/ Pedestrian and Bicycle Facilities, of this environmental document for details).

#### *Los Angeles County*

The HDC build alternatives would provide additional access to three park-and-ride lots in the Antelope Valley area of Los Angeles County. One on West Avenue R-8 at Pelona Vista Park is located approximately 2 miles south of the HDC. This location is owned by the City of Palmdale and has 445 parking spaces. The second is located along West Avenue S at Geiger Road, approximately 3 miles south of the HDC to the west of SR-14. This lot has 430 spaces and is owned by the State. A short distance away, to the east of SR-14 along East Avenue S, and adjacent to Lake Palmdale, is the third park-and-ride lot. This lot is owned by the State and has 1,082 spaces.

#### *San Bernardino County*

The HDC build alternatives would provide additional access to two existing park-and-ride lots. Both locations are located south of the project alignment. One is located 12 miles south of the HDC within Hesperia at US 395 and has 186 parking spaces. The other lot is located 6 miles south of the HDC at I-15 and Bear Valley Road and has 70 parking spaces.

### 2.4.6 Utility Relocation

Utility relocation is proposed as part of the HDC build alternatives. Utilities located longitudinally (i.e., parallel to the HDC alignment) in the proposed ROW would be relocated outside of the HDC Project footprint. Subsurface utilities crossing the HDC ROW would be relocated into protected casings across the HDC ROW.

### 2.4.7 Retaining Walls and Soundwalls

Retaining walls would be constructed at several locations. Retaining walls are used to minimize the amount of grading, avoid or minimize ROW acquisitions in developed areas, and avoid or minimize impacts to sensitive resources. Retaining wall locations would be refined in the final design phase of project development.

Soundwalls would be constructed to provide noise attenuation for existing noise-sensitive land uses, as well as noise-sensitive land uses that are under construction or are fully permitted for development. Proposed soundwall locations are based on the results of the noise study prepared for this project and are provided in Section 3.2.7, Noise, of this environmental document.

### 2.4.8 Lighting

Caltrans standards require highway safety lighting at particular points in interchange areas to illuminate areas of potential vehicle conflict and to delineate exit ramps, entrance ramps, and island noses. Pole-mounted safety lighting would be provided at the system and service interchanges, ramps, and other areas as required by Caltrans Highway Standards. Electric power for all lighting would be furnished from within the Green Energy component of this proposed project; otherwise, energy to support lighting would need to be provided by the utility company.

All lighting would be shielded and directed to focus downward to illuminate only the HDC Project and connecting roads to minimize light leakage outside the required safety lighting areas. Any existing lighting on SR-14 and I-15 impacted by connection of the HDC Project would be replaced.

There would be no lighting on the HDC mainline. When possible, the HDC Project would follow the “Dark Skies” initiative from Los Angeles County (Town and Country Specific Plan) and San Bernardino County General Plans.

### 2.4.9 Landscaping

Landscaping would be provided within the HDC ROW and affected ROW of SR-14 and I-15. Replacement planting would be provided for any existing landscaping impacts. Landscaping would generally consist of native plant species, particularly in areas adjacent to undeveloped land and existing/proposed habitat served areas with native plant species. All plant species would be drought tolerant to minimize the needs for irrigation. Highway planting would be provided between the edge of pavement and the cut/fill line and at all water quality Best Management Practice (BMP) stormwater basins that are suitable to the area.

### 2.4.10 Fencing and Median Barriers

Fencing would be installed along the ROW limits for the entire length of the HDC build alternatives. The height of the fencing would vary, with urban areas at 6 feet and rural areas at 5 feet. The type of fencing may include, but is not limited to, (1) chain link fencing in urban or developed areas and (2) barbed wire and wire mesh in rural areas. The specific locations and fence types and heights would be finalized in consultation between Caltrans and the affected jurisdictions during final design. The current preliminary engineering design-level plans do not provide this level of detail.

The HDC Project mainline would have a combination of concrete barrier and a beam barrier in the center of the median in certain areas. A concrete barrier is comprised of rigid reinforced concrete with a 24-inch-wide base, 36 inches high, narrowing to 6 inches wide at the top. Concrete barriers may require drainage modifications and aesthetic treatment for context-sensitive design. This could include gaps and/or openings for

animals to cross if required for certain locations. The thrie beam barrier is more aesthetically compatible with rural and natural areas because it accommodates small animal crossings and preserves and protects median plantings. This type of barrier is not visually compatible in metropolitan areas. At the interchange areas where the HDC interfaces with SR-14 and I-15, a concrete barrier would be used in the median.

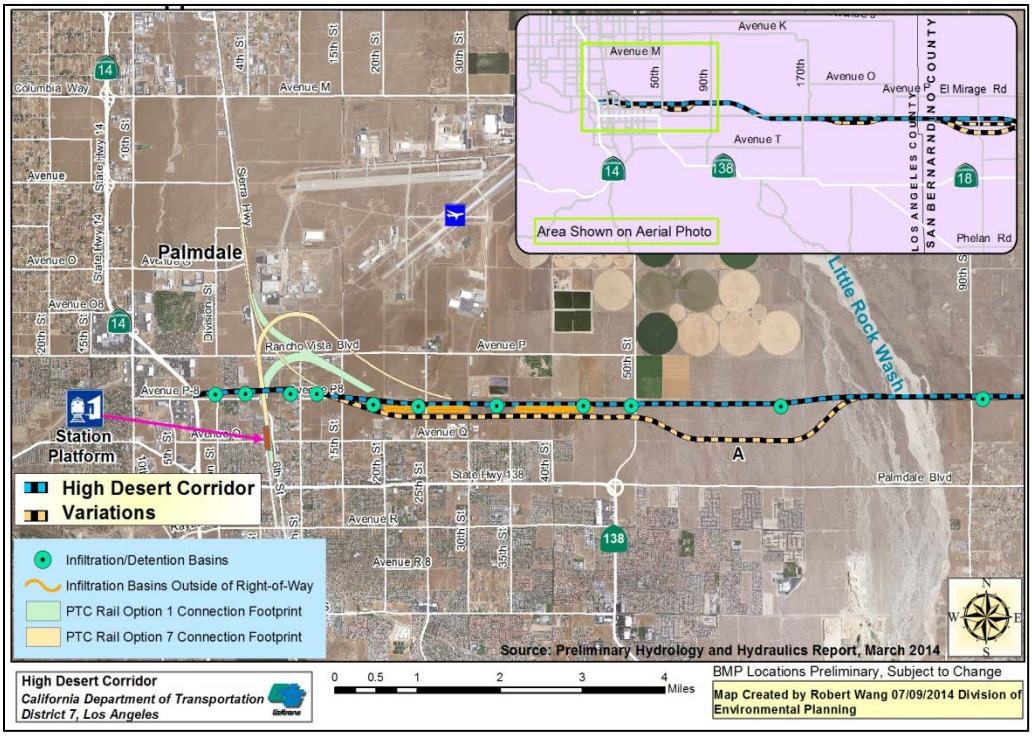
### 2.4.11 Runoff Management

The HDC Project would incorporate infiltration basins as Permanent Treatment BMPs to remove pollutants from stormwater runoff prior to discharge to receiving waters. Approximately 67 infiltration basins are being proposed along the corridor (refer to Figures 2-34 through 2-39).

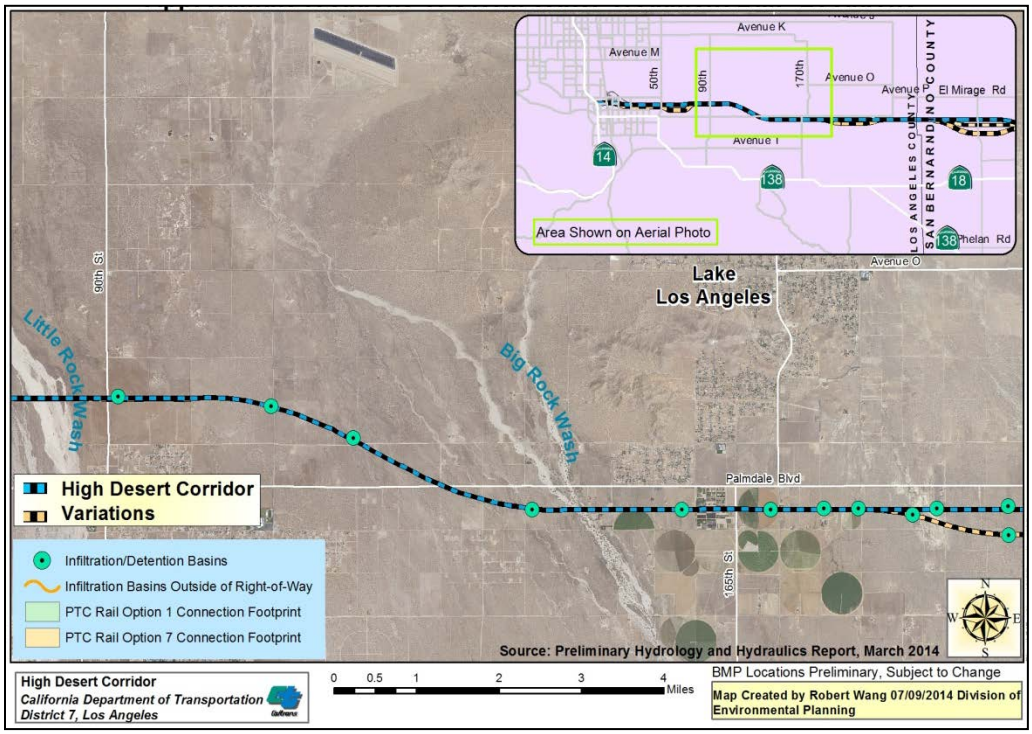
### 2.4.12 Grading

All HDC build alternatives would require extensive grading. Most of the HDC would be constructed 6 to 8 feet above ground on fill material. This is necessary because the High Desert region is prone to flash flooding. The project would be designed to reduce the earthwork quantities by engineering the roadway design to closely follow the natural terrain.

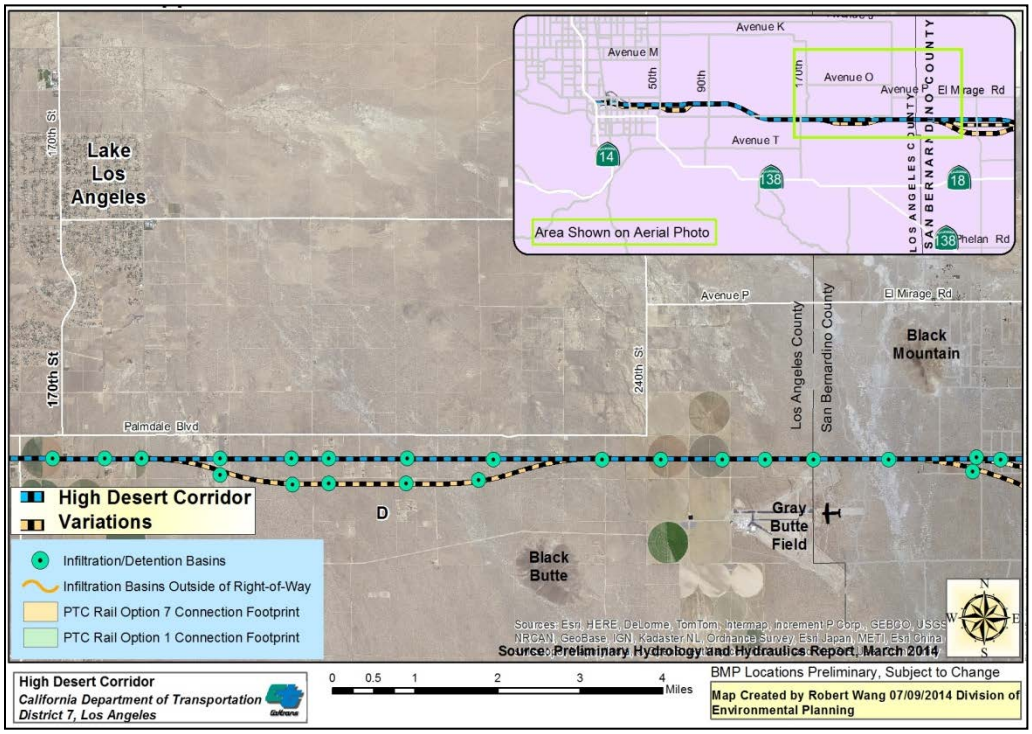
**Figure 2-34 High Desert Corridor Infiltration Basin Locations 1 to 12**



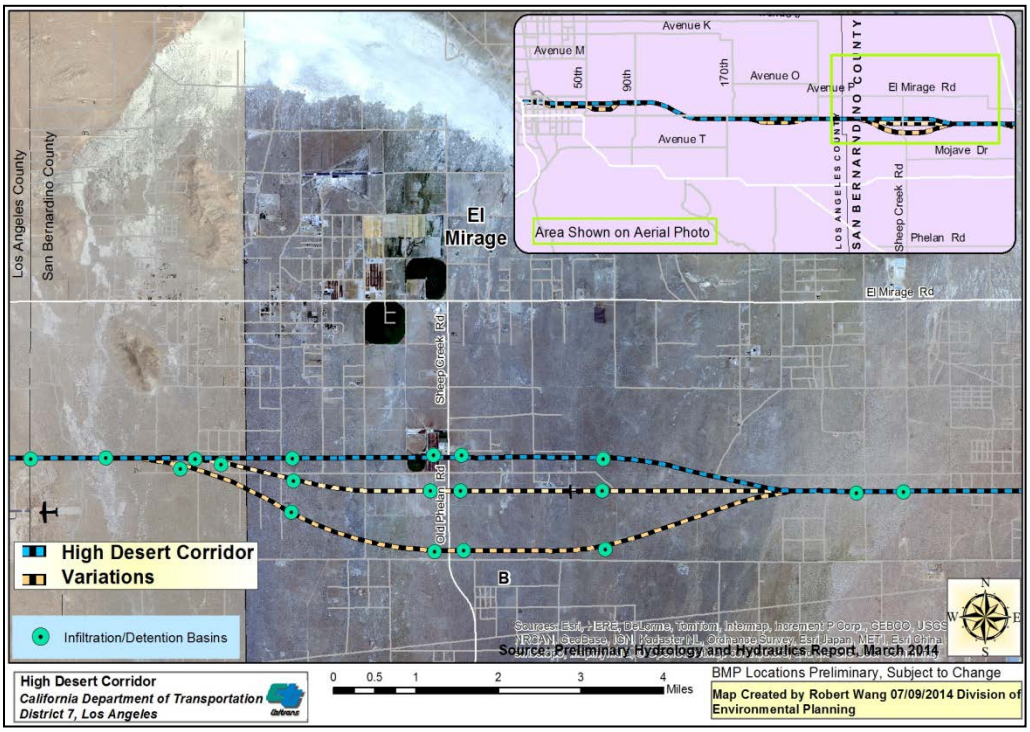
## Figure 2-35 High Desert Corridor Infiltration Basin Locations 13 to 22




## Figure 2-36 High Desert Corridor Infiltration Basin Locations 22 to 33



## Figure 2-37 High Desert Corridor Infiltration Basin Locations 33 to 39




## Figure 2-38 High Desert Corridor Infiltration Basin Locations 39 to 49

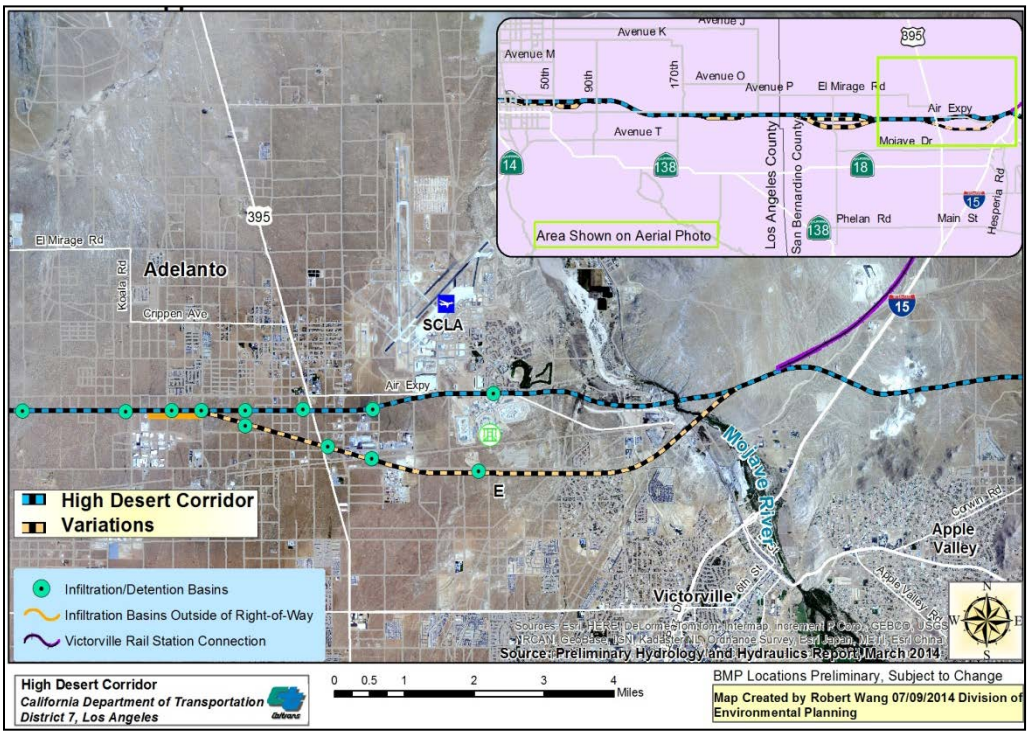
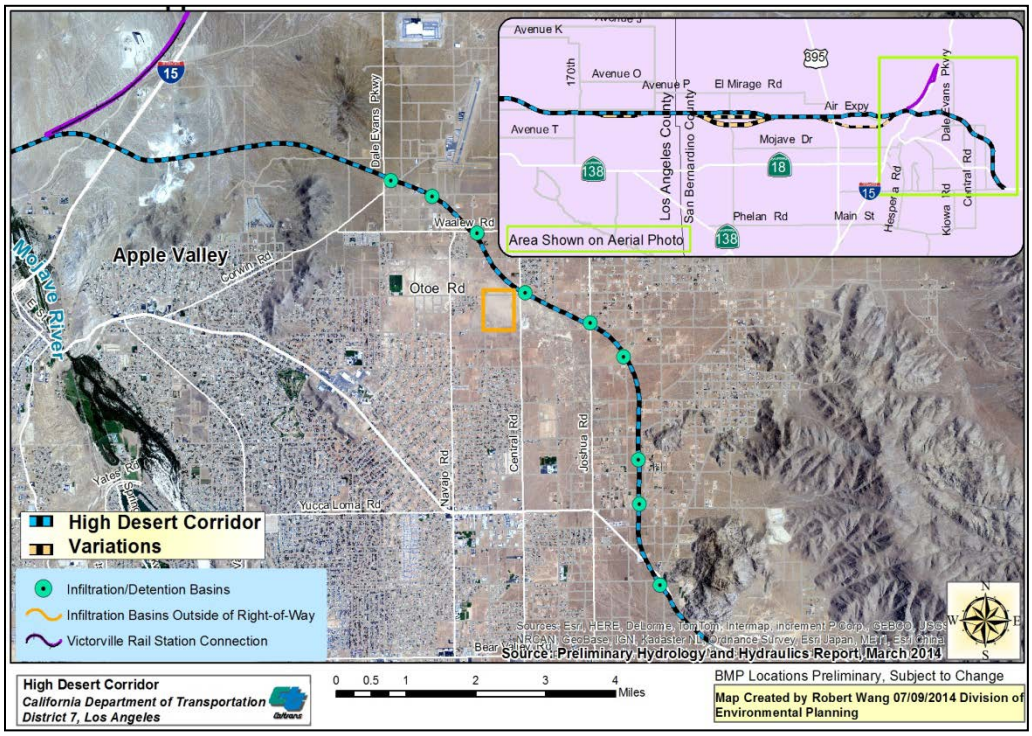


**Figure 2-39 High Desert Corridor Infiltration Basin Locations 49 to 67**




## 2.4.13 Changes to Local Circulation

All HDC build alternatives would result in local street closures adjacent to the proposed alternative alignment.

### *At-Grade Intersections*

There would be no at-grade intersections in Los Angeles County. At-grade intersections in San Bernardino County, specifically in Apple Valley, would be located at:

- Waalew Road
- Central Road
- Joshua Road
- Yucca Loma Road
- Standing Rock Avenue

Traffic signals are proposed at the intersections listed above.

### *Cul-de-Sacs*

The proposed HDC alignment has the potential to affect existing east-west and north-south arterial and collector streets. Any connection to local streets that would be affected would be offset with an undercrossing to maintain connectivity within the vicinity of the cul-de-sac streets. The locations of the undercrossings would coincide with the proposed on-/off-ramp locations and grade separations. Those streets that would be closed to thru traffic are identified below by county as shown in Table 2-2.

**Table 2-2 Locations and Number of Cul-de-sac Roadways Resulting from HDC Construction**

| Los Angeles County | Number of Cul-de-Sac Roadways |
|---|---|
| On Avenue P-5 at 10th Street East, North of HDC | 1 |
| On Avenue P-8 at 10th Street East, South of HDC | 1 |
| On Avenue P-8 between 40th Street East and 50th Street East, North of HDC | * |
| **San Bernardino County** | |
| On Air Expressway between Phantom Road West and Turner Road | * |
| On Air Expressway, near Turner Road, South of HDC | 1 |
| On George Boulevard at Air Expressway, North of HDC | 1 |
| On Turner Road, near National Trail Highway, South of HDC | 1 |
| On Corwin Road, North of HDC | 1 |
| On Navajo Road, North and South of HDC | 2 |
| On Cahuilla Road, North of HDC | 1 |
| On SR-18 West of Valley Vista Road, West of HDC | 1 |
| On SR-18 at Japatel Road | 1 |

*Both ends closed.

### 2.4.14 Railroad Crossings

All HDC build alternatives would involve the transverse crossing of railroad lines that would be grade separated by a structure. These crossings would be located at Sierra Highway in Palmdale, across from Rockview Park and east of the Mojave River in Victorville, and at a future SCLA rail spur line that currently stops short of Turner Wash. In Palmdale, the HDC would be on an elevated structure that crosses over the train tracks. The railroad lines are owned by UPRR and BNSF. No new railroad alignments for these rail freight lines are proposed. Early railroad notification would be affected due to the lengthy approval process typically encountered with new or modified railroad crossings. Temporary Construction Easements (TCEs) are possible at these locations, as well as possible footing easements for structural supports, depending on the design.

### 2.4.15 Geotechnical Borings and Utility Potholing

Geotechnical boring and utility potholing activities would be conducted during final design. The duration of the geotechnical borings would be one day or less at any given geotechnical borehole location. Appropriate permits would be obtained from the affected local jurisdiction, and all potholing activities would be conducted in accordance with those permits.

### 2.4.16 Property Acquisition and Temporary Construction Easement

The HDC Project would require the permanent acquisition of ROW. The numbers of full and partial acquisitions for the HDC build alternatives are summarized in Section 3.1.4, Community Impacts. Appendix L provides the list of parcels identified for acquisition.

### 2.4.17 Context Sensitive Design

During the HDC alternative analysis process, there were opportunities to apply context sensitive design features. The plans presented in the environmental document were influenced by this environmentally sensitive approach. Context sensitive design solutions will be an on-going effort. There will be additional attention to project design in the following areas:

- Evaluation of median versus side rail alignments
- Evaluation of viaduct versus fill applications for rail and highway profiles
- Interchange design selection including deferred construction

Additional integration of context sensitive design opportunities may result from agency and public comments on the Draft EIR/EIS.

## 2.5 Construction Phasing of Build Alternatives

Information regarding the phasing of build alternatives is preliminary and dependent on funding availability. Construction of any of the HDC build alternatives is estimated to take approximately 3 to 4 years (36 to 48 months) if the project were to be constructed entirely at one time. Should funding not be available to construct the project at one time, a phasing plan would be developed. It is important to note that funding has not been secured for construction of any of the proposed alternatives.

Table 2-3 outlines potential funding and construction phasing scenarios for the HDC, for discussion purposes.

**Table 2-3 Potential HDC Project Funding Scenarios for Discussion Purposes**

| Phase | Description | Construction Timeline | County |
|---|---|---|---|
| **Scenario 1 Publicly Funded Highway** | | | |
| 1 | Construct both West and East segments; 10-mile freeway segment from SR-14 to 90th Street East and a 9.7-mile segment between US 395 and I-15 and to Choco Road. | 2018-2022/2023 | LA/SB |
| 2 | Construct expressway from 90th Street East to US 395. | Post 2023 to 2029/2030 | LA/SB |
| 3 | Complete Apple Valley expressway portion from Choco Road to SR-18 (Bear Valley Road). | 2030 to 2034/2035 | SB |
| 4 | Transition middle segment 90th Street East to US 395 from expressway to freeway. | 2035 to 2039 | LA/SB |

**Table 2-3 Potential HDC Project Funding Scenarios for Discussion Purposes**

| Phase | Description | Construction Timeline | County |
|---|---|---|---|
| **Scenario 2 PPP Funded Tollway Highway Only** | | | |
| 1 | Similar to Scenario 1, construct both West and East segments; 10-mile freeway segment from SR-14 to 90th Street East and a 9.7-mile segment between US 395 and I-15 and to Choco Road at the same time as single project. A component of this project is tollway portion from 90th Street East to US 395. | 2018 to 2024/2026 | LA/SB |
| 2 | Acquire ROW, then build the Apple Valley expressway portion from Choco Road to SR-18 (Bear Valley Road). | 2026 to 2030/2031 | SB |
| **Scenario 3 Freeway/Expressway plus PPP High-Speed Rail** | | | |
| 1 | Acquire ROW, then conduct grading that would accommodate a multimodal facility. Rail would be built first between SR-14 and I-15. | 2018/2021 | LA/SB |
| 2 | With rail built, freeway would be constructed next from SR-14 to east of I-15 to Choco Road. | 2018-2022/2023 | LA/SB |
| 3 | Acquire ROW, then build expressway portion from Choco Road to SR-18 (Bear Valley Road). | 2025 to 2029/2030 | SB |
| **Scenario 4 PPP Freeway/Expressway plus PPP High-Speed Rail** | | | |
| 1 | Acquire ROW, then conduct grading that would accommodate a multimodal facility. Rail would be built first between SR-14 and I-15. | 2018 to 2021 | LA/SB |
| 2 | Construct highway between SR-14 and Dale Evans Parkway. Segment between 90th Street East and US 395 built as toll facility. | 2021 to 2025 | LA/SB |
| 3 | Acquire ROW, then build Apple Valley expressway from Choco Road to SR-18 (Bear Valley Road). | 2025 to 2029/2030 | SB |

*Source: HDC Phasing Document, November 2013*

## 2.6 Comparison of Alternatives

Table 2-4 provides a comparison of costs between the HDC build alternatives broken down by major funding categories. Table 2-5 provides a comparison of the key features and potential mobility effects of the No Build and build alternatives.

## Table 2-4 High Desert Corridor Cost Estimate

| Category Engineering | Estimate Cost Breakdown (Billions of Dollars) | | | | |
|---|---|---|---|---|---|
| | **No Build** | **Freeway/ Expressway** | **Freeway/ Tollway** | **Freeway/ Expressway with Rail** | **Freeway/ Tollway with Rail** |
| Roadway Items | 0 | 2.382 | 2.382 | 2.382 | 2.382 |
| Rail Items | 0 | 0 | 0 | 2.230-4.127 | 2.230-4.127 |
| Road Structures | 0 | 0.645 | 0.645 | 0.767 | 0.767 |
| Tollway Cost | 0 | | 0.023 | | 0.023 |
| Right-of-Way Items | 0 | 0.568 | 0.568 | 0.843 | 0.843 |
| Total Cost | 0 | 3.595 | 3.618 | 6.222-8.119 | 6.245-8.142 |

## Table 2-5 Comparison of Alternatives

| Project Mobility Effect | No Build | Freeway/ Expressway | Freeway/ Tollway | Freeway/ Expressway with Rail | Freeway/ Tollway with Rail |
|---|---|---|---|---|---|
| Project Purpose and Need/Project Objectives | No | Yes | Yes | Yes | Yes |
| System Interchanges | No | Yes | Yes | Yes | Yes |
| Access | No | Yes | Yes | Yes | Yes |
| Design Variations | No | Yes | Yes | Yes | Yes |
| Travel Pattern Disruptions (Ranking: 1 Least Impacting, 3 Most Impacting) | 1 | 2 | 2 | 2 | 2 |

After the public review period of the Draft EIR/EIS, all comments will be evaluated, and Caltrans will select a preferred alternative and make the final determination of the project's effect on the environment. In accordance with the California Environmental Quality Act (CEQA), Caltrans will certify that the project complies with the CEQA, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered before project approval. Caltrans will then file a Notice of Determination with the State Clearinghouse that will identify whether the project will have significant impacts, mention whether mitigation measures are included as conditions of project approval, and state that findings were made and that a Statement of Overriding Considerations was adopted. With respect to the National Environmental Policy Act (NEPA), Caltrans, as assigned by the Federal Highway Administration, will document and explain its decision regarding the selected alternative, project impacts, and mitigation measures in a Record of Decision in accordance with the NEPA.

## 2.7 Design Alternatives, Variations, and Options Considered but Eliminated from Further Consideration

### 2.7.1 Freeway Segments

An Alternative Analysis (AA) and a Value Analysis (VA) were completed for the proposed project in September 2011 and January 2014, respectively. Both of these studies focused on the highway component of the project (a Rail Alternatives Analysis was completed in December 2013). The VA was focused on a small 12-mile segment of the project from SR-14 to 100th Street East, while the more detailed and comprehensive AA evaluated the entire 63-mile corridor, which includes the segment from SR-14 to 100th Street East.

Based on the result of the VA workshop, 11 alternatives were identified that have since been eliminated due to conflicts with mainline and local operations (i.e., city streets) and concerns with environmental impacts, construction impacts, maintainability, and land use compatibility to the extent that they are not considered viable alternatives. One such alternative eliminated was similar to the main alignment and Variation A, except for the portion between 20th Street East and 30th Street East where it bisects the two proposed alternatives. Due to the close proximity of this alternative to Variation A, this alternative was no longer considered. Another alternative proposed was also eliminated due to potential impacts to Joshua trees.

In the AA, the alternatives and variations were evaluated relative to environmental and construction effects, traffic, ROW costs, joint development opportunities, and ability to meet regional and local transportation goals. Based on the screening process used, alternative(s) and variations were withdrawn from consideration that did not meet project objectives, such as meeting local transportation goals or maximizing joint development opportunities (refer to Table 2-6 for alternatives and variations eliminated from evaluation).

### 2.7.2 Depressed Freeway

Another rejected alternative dealt with the portion of the HDC between SR-14 and 10th Street East. As proposed, this alternative would have depressed the freeway approximately 27 feet below ground. This alternative presented several problems, including drainage and flooding concerns, additional ROW, a larger project footprint, more impact to railroad crossings, and additional ground or habitat disturbance.

## Table 2-6 HSR Alignment Options Eliminated from Evaluation

| Option | North Wye* | | | South Wye | | | Impacts | Reason for Elimination |
|---|---|---|---|---|---|---|---|---|
| | Location | Crossing Type | Double or Single Track | Location | Crossing Type | Double or Single Track | | |
| 1 | North of Airport | Over | Single | North of Airport | Under | Single | LAWA Property, Future Power Plant | Power plant impact, at-grade crossing |
| 1A | North of Airport | Over | Double | South of Airport | Over | Double | LAWA Property | South wye connection pushes Palmdale Transit Center farther south |
| 1A1 | North of Airport | Over | Double | South of Airport | Over | Double | LAWA Property | Station located south of Palmdale Boulevard |
| 1A2 | North of Airport | Over | Double | South of Airport | Over | Double | LAWA Property | Station located south of Palmdale Boulevard |
| 1B | North of Airport | Over | Double | South of Airport | Under | Double | LAWA Property, Water Treatment Plant | Water treatment plant impact, pushes Palmdale Transit Center farther south |
| 1B1 | North of Airport | Over | Double | South of Airport | Under | Double | LAWA Property | Impacts encroach into Lancaster, largest impacts of all options would also encroach onto LAWA property |
| 1B2 | North of Airport | Over | Double | South of Airport | Under | Double | LAWA Property | Impacts encroach into Lancaster, largest impacts of all options would also encroach onto LAWA property |
| 2 | North of Airport | N/A | Single | North of Airport | N/A | Single | LAWA Property, Future Power Plant | Power plant impact, at-grade crossing |
| 3 | North of Airport | Over | Single | North of Airport | South of Station Over | Double | LAWA Property, Future Power Plant | Power plant impact and airport impacts |
| 4 | South of Airport | Over | Single | South of Airport | South of Station Over | Single | N/A | Impact to structures within loop |
| 5 | South of Airport | Over | Single | South of Airport | South of Station Over | Double | N/A | Single track connection, one-seat ride not possible |
| 6 | South of Airport | Over | Single | South of Airport | South of Station Over | Double | Plant 42 | Plant 42 impact |

## Table 2-6 HSR Alignment Options Eliminated from Evaluation

| Option | North Wye* | | | South Wye | | | Impacts | Reason for Elimination |
|---|---|---|---|---|---|---|---|---|
| | Location | Crossing Type | Double or Single Track | Location | Crossing Type | Double or Single Track | | |
| 7 | South of Airport | Over | Double | South of Airport | Under | Double | LAWA Property, Plant 42 | Impact to Plant 42 southwest corner |
| 7A | South of Airport | Over | Double | South of Airport | Under | Double | N/A | Station located south of Palmdale Boulevard |
| 7A1 | South of Airport | Over | Double | South of Airport | Under | Double | N/A | Station located south of Palmdale Boulevard |
| 7B | South of Airport | Over | Double | South of Airport | Under | Double | LAWA Property | Station located south of Palmdale Boulevard |

*Wye – a track arrangement with three switches and three legs for reversing the direction of a train.

### 2.7.3 Variation B North and Variation C

A comprehensive AA was completed on September 2011 and, as a result of this analysis, Variation B North and Variation C were eliminated from further study. Variation B North was not selected for further analysis because the alignment would pass through Meadowbrook Dairy property off of Sheep Creek Road and affect dairy operations at this facility. Variation C would run slightly southwest of Falchion Road and cross Corwin Road to existing SR-18 (Happy Trails Highway). The AA concluded that Variation C would bisect Apple Valley and result in numerous residential and business impacts; therefore, it was eliminated from further study. This variation was also in conflict with the Town of Apple Valley's General Plan land use map, which shows an HDC alignment farther north.

### 2.7.4 Variation D

Variation D North, which runs north of the main alignment between 190th Street East and 230th Street East, was proposed to avoid a large residential property with vineyards. This alignment variation was eliminated because of numerous potential residential impacts and a potential land use conflict. One of the parcels in the path of this variation is zoned under Los Angeles' County Land Use designation as Open Space and is owned by the BLM.

Variation D was refined to include a shorter shift south. As originally proposed, the project limits of Variation D were from approximately 150th Street East to 230th Street East. To minimize effects to agricultural parcels, the variation was shortened by approximately 3 miles to begin its southerly dip from approximately 190th Street and end at 230th Street East.

### 2.7.5 Palmdale Transit Center High-Speed Rail Connection Options

A rail alternatives analysis was conducted to determine the viability of certain HDC HSR connections into the existing Palmdale Transit Center. Table 2-5 identifies the rail Option 1 variations that were eliminated for a variety of reasons, such as property impacts, farmland impacts, grade crossing conflicts, and not meeting design criteria.

### 2.7.6 Hybrid Alternative

Recognizing that a wide range of corridor configurations and technology options were to be considered for the HDC, the concept of a Hybrid Alternative was initially articulated by the sponsor agencies. There was also a positive response to this concept heard at some public information meetings; however, because the merits of the primary alternatives have not been subjected to public comment, and also because firm notions regarding which components of those alternatives could or should be combined, there is no defined Hybrid Alternative at the present time. A complete review of the merits of the various components of each of the presently proposed alternatives will occur after public circulation of this Draft EIR/EIS. Depending on those relative merits and commentary on this Draft EIR/EIS, there is a potential, after public circulation of this Draft EIR/EIS, that components of one or more of the existing alternatives could be selected to comprise a Hybrid Alternative. This would

occur after considering public and agency comments, combined with the funding potential of the existing alternatives. A combination of elements of the current alternatives could be considered at that time. It is also highly probable that one of the current alternatives could be selected in its entirety. Therefore, until such time as the components of a potential Hybrid Alternative become known, and the merits are fully understood, such alternative is not considered or evaluated in this Draft EIR/EIS.

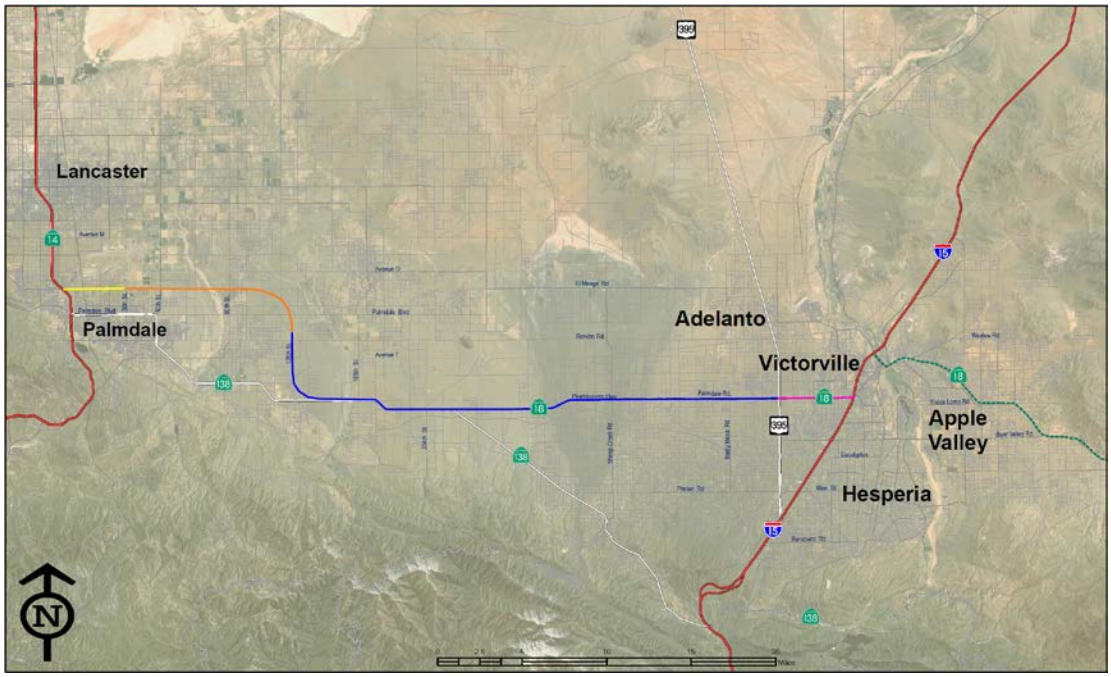
### 2.7.7 Transportation System Management Feasibility Evaluation

A TSM Alternative was proposed originally as a result of agency and public input during circulation of the Notice of Intent (NOI)/Notice of Preparation (NOP) in 2009 and subsequently amended in 2010. The TSM Alternative was included during the AA in 2011 and evaluated in the Draft Traffic Study technical report (March 2013) and further evaluated in November 2013.

The TSM approach to addressing transportation issues is typically focused on increasing the capacity of the State and local transportation systems by increasing the number of peak-hour person-trips without major construction and associated capital expenditures. The TSM Alternative attempts to identify to what degree a transportation need can be satisfied with limited financial resources; therefore, it often functions to set a baseline condition against which the performance of more substantial and costly capital improvement options are measured. TSM strategies are intended to first focus on increasing the efficiency of existing facilities; they are actions that increase the number of vehicle trips a facility can carry without a major expansion of capacity. A TSM strategy may include a variety of techniques, including ramp metering, HOV lanes, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination. TSM also encourages increased automobile occupancy through ridesharing programs, increased use of public transit systems, and bicycle and pedestrian improvements as elements of a unified urban transportation system.

The initial definition of the TSM/Transportation Demand Management (TDM) Alternative for the HDC therefore included “operational investments, policies, and easily implemented, low-cost improvements aimed at improving goods movement, passenger auto and transit travel, and reducing environmental impacts associated with transportation as they may affect cities and operations in the HDC study area.” As development of the HDC progressed, the TSM/TDM Alternative was modified to enhance the ability of the alternative to address the purpose and need for the HDC Project. This resulted in a definition of TSM components that included some capacity enhancements in addition to pure TSM techniques. The general alignment of the TSM Alternative components is shown in Figure 2-40.

**Figure 2-40. Transportation System Management Alternative Alignment**




The TSM Alternative considered for evaluation was defined as a mix of lower-cost roadway improvements within and outside the proposed project corridor that could be evaluated against the proposed project alternatives (i.e., build alternatives). Starting off like the build alternatives, the TSM Alternative extended east across mostly open terrain from SR-14 parallel with and near East Avenue P-8. At approximately 110th Street East, the TSM alignment bent to the southeast across East Palmdale Boulevard before proceeding due south in the vicinity of Longview Road to East Avenue T. Extending approximately 0.5 mile farther south (Longview Road currently terminates at East Avenue T), the alignment curved southeast across open terrain to connect with the existing SR-138 east of the community of Pearblossom. From this point east, the TSM improvements would occur along the existing SR-138/SR-18 corridor to an east terminus at Interstate 15 (I-15). Except for a freeway between SR-14 and 30th Street East, the TSM roadway improvements would maintain at-grade intersections with local roads and driveway access. The following five key elements were taken into consideration for defining the TSM Alternative.

1. **New Palmdale Freeway:** To alleviate east-west traffic congestion in Palmdale, the TSM Alternative included ROW acquisition for an eight-lane, 3.4-mile-long, grade-separated freeway parallel with and near Technology Drive/East Avenue P-8 from SR-14 to 30th Street East. Facility improvements along SR-14 required to accommodate the freeway-to-freeway interchange were assumed to be identical to those defined for the build alternatives. New local interchanges would be built at 20th Street East and 30th Street East. The existing partial interchange at SR-14/ Rancho Vista Boulevard would be closed, and a full interchange would be constructed at 10th Street West to provide better weaving distance with the direct

connector ramps of the SR-14/HDC interchange. A viaduct would be constructed between Division Street and 10th Street East.

2. **Expressway from 30th Street East to Longview Road:** From the freeway terminus, the TSM Alternative would extend east as an access-controlled, four-lane divided expressway. After passing due east across Little Rock Wash, then 100th Street East, the alignment would bend southeast to Palmdale Boulevard, then south-southeast to Longview Road. A viaduct structure could be required across Little Rock Wash.

3. **Highway from Longview Road to US 395:** The north-south portion of this segment would run along or parallel to Longview Road past its terminus at East Avenue T before bending southeast to a new signalized T-intersection at SR-138. Extending east from the community of Pearblossom, this TSM component would involve widening where necessary along the existing SR-138/SR-18 highway to four lanes. A roadway cross section similar to what currently exists along SR-138 (Pearblossom Highway) from Longview Road to 165th Street East was assumed. This cross section would provide standard-width shoulders, two 12-foot-wide travel lanes per direction, and a wide median. A 4- to 20-foot-wide median was assumed to facilitate left-turn movements to cross streets and driveways.

   Continuing east, SR-138 was widened to four lanes between Longview Road and 165th Street East in 2006/2007 as part of Caltrans' SR-138 Corridor Improvement Program. This program entails complete widening of SR-138 from Avenue T in Palmdale to the junction of SR-18 in Llano. While technically part of the TSM Alternative, the segment of SR-138 east of Longview Road would not require widening.

4. **Arterial Highway between US 395 and I-15:** From approximately 5 miles east of US 395 (west of Caughlin Road) to I-15, SR-18 (Palmdale Boulevard) would be widened to a six-lane arterial highway in accordance with City of Victorville roadway standards. The City's General Plan circulation map designates this portion of Palmdale Road as a "super arterial" having a 124-foot ROW.

5. **Roadway and Signal Improvements:** The TSM Alternative would also include minor improvements to roadway sections and signals along SR-18 from I-15 to Bear Valley Road. The strategy behind these works would be to focus on improving traffic flow designed to increase average travel speeds while reducing vehicle delay and idling. Specific projects could include traffic signal synchronization and intersection improvements.

Several factors were considered in evaluating the TSM Alternative. These include:

- Meeting the proposed project's purpose and need
- Benefits estimates
- Cost effectiveness

### Purpose and Need Evaluation

In evaluating whether the TSM/TDM is meeting the HDC's Purpose and Need, the following elements were considered.

#### Route Continuity

The TSM Alternative would not address the need for a continuous, direct east-west connection between the developed areas of the southern Antelope and Victor valleys, because the areas are separated by distances that make connection using existing roads subject to localized conditions that are difficult to overcome without creating a new corridor and developing access restrictions. Except for the freeway/expressway components across Palmdale, the TSM Alternative route follows the existing, circuitous highway routing that currently contributes to traffic congestion on SR-138/SR-18 and adjoining highways and local streets.

The TSM Alternative would require motorists to travel several miles in the wrong direction to reach some destinations. For example, a motorist traveling from Apple Valley to Los Angeles/Palmdale Regional Airport must first travel northwest on SR-18 to I-15, then south on I-15 to SR-18 (Palmdale Boulevard), then west to Pearblossom, then back north and northwest several miles to East Avenue P-8, then west and farther north to the airport. Eastbound travelers intending to access I-15 northbound would also drive several miles out of direction to reach their destinations. According to the Draft *Traffic Study Report* (Parsons, 2013), the TSM Alternative route is 4 miles longer than the build alternatives. For these reasons, the TSM Alternative would not perform well in terms of route continuity.

#### Mobility

By building the freeway/expressway component across approximately 3.3 miles of Palmdale, the TSM Alternative would partially address existing mobility issues within the SR-138/SR-18 corridor. For the remaining 60 miles of the corridor, motorists' mobility would be challenged by speed limit changes, signal- and stop-controlled intersections, and direct-access points (e.g., driveways and local roadways) that impede traffic flow. Furthermore, with the TSM Alternative, trucks and other commercial traffic using the corridor would still be required to transition among rural highway, local arterials, and freeway segments. In comparison with freeway travel under the build alternatives at buildout, the TSM Alternative would require travel through more than 30 roadway intersections plus numerous driveway and unpaved road access points between its short freeway terminus in Palmdale and I-15 in Victorville; therefore, in comparison to the build alternatives, the TSM Alternative offers substantially less benefit in terms of mobility.

#### Level of Service and Congestion

Based on population growth projections for the southern High Desert region, traffic congestion is predicted to get much worse, with several existing rural and urban intersections expected to operate at unacceptable levels of service (i.e., LOS E or F) in 2020, 2040, or both years. The TSM Alternative would alleviate existing and future traffic congestion for approximately 3.3 miles across the north side of Palmdale by

moving traffic off local streets to a new freeway. Widening along existing state routes 138 and 18 would also somewhat improve future traffic conditions; however, unlike the build alternatives, the TSM Alternative would not remove the above-mentioned conditions that contribute to traffic congestion (i.e., lower speed limits in urban areas, cross traffic at intersections, direct local roadway and driveway access points) that impede traffic flow. The travel time analysis conducted using SCAG's travel forecast model shows that the TSM Alternative would outperform the No Build Alternative, but it would substantially underperform any of the build alternatives. During the morning (AM) peak period, travel time from Apple Valley to Lancaster is projected to take more than 0.5 hour longer than with the build alternatives. During the afternoon (PM) peak period, the TSM Alternative is projected to take almost 35 minutes longer. Given these considerations, future traffic congestion under a TSM Alternative project would be much worse than conditions under any of the build alternatives.

### *Safety and Reliability*

TSM Alternative improvements would result in safety benefits through development of a controlled-access highway across Palmdale, eliminating all two-lane State highway segments, and making road and signal improvements to improve traffic flow; however, the TSM Alternative would not achieve the level of safety and reliability associated with the build alternatives, because it would retain multiple access points via private driveways and intersections and an at-grade railroad crossing. The frequency of accident occurrence is typically lower on freeways and expressways compared to other types of regional roads and city streets. Data provided in the Draft *Traffic Study Report* (Parsons, 2013, see Table 5-3) for the HDC Project indicates that traffic injury and fatality rates for urban arterials are much higher than for urban freeways.

Due to its location on the desert floor just north of the San Gabriel Mountains, the wide washes and other water courses that traverse north across the SR-138/SR-18 highway can bring flash flooding, especially during summer when heavy localized monsoonal thunderstorms are typical. A new freeway/expressway associated with the build alternatives would not be prone to flooding, because preliminary design entails construction of the new facility approximately 10 feet above existing grade of the desert floor.

### *Regional Transportation System Accessibility*

By adding a new highway across Palmdale to the community of Pearblossom and widening existing highway east to I-15, the TSM Alternative would somewhat improve east-west accessibility across the southern High Desert region. This could be beneficial to either the Los Angeles/Palmdale Regional Airport or SCLA, both of which have generated considerable interest as potential centers for future economic growth. The TSM Alternative would also improve access to the Palmdale Transportation Center for regional bus and rail transit, and for potential future HSR transfers.

However, the TSM Alternative would not achieve the high level of accessibility to these transportation systems associated with the build alternatives, because it would rely on an existing indirect and discontinuous route across the region with numerous intersections, while requiring out-of-direction travel to reach connections with major north-south highway facilities. Unlike the build alternatives, the TSM Alternative would not include a direct and continuous new route connecting major north-south highway facilities at freeway-to-freeway interchanges with direct ramp connectors.

While the proposed build alternatives would cross the High Desert along an east-west extension of Air Expressway, providing excellent access to SCLA, the TSM Alternative would extend west from Palmdale Boulevard, located approximately 4.5 miles to the south of SCLA. Motorists trying to access SCLA from Palmdale Boulevard would likely choose to navigate north along US 395, which can experience heavy congestion during peak travel periods.

In Palmdale, both the TSM and build alternative projects include a west-end freeway; thus, local access to the Los Angeles/Palmdale Regional Airport and Palmdale Transportation Center would be similar. However, regional access to these transportation centers would be inferior with the TSM Alternative because of the aforementioned alignment and operational deficiencies.

### *Greenhouse Gas Emissions*

In comparison to the build alternatives, the TSM Alternative would result in lower GHG emissions during construction but much higher emissions over long-term operations. Carbon dioxide and other GHG-contributor emissions during construction of the TSM Alternative would be much less than any of the build alternatives, because it is a considerably smaller project; however, emissions from vehicles during TSM Alternative operations would be much greater due to longer routing, numerous required stops and starts, and increased congestion. The use of green energy technologies is not planned with the TSM Alternative; therefore, this option for reducing GHG emissions would not be available.

## *Benefits Estimates*

Benefits evaluated for the TSM Alternative and discussed below are “user” benefits, revenue transfers, reductions in external costs, and life-cycle benefits. These benefits were calculated for the *Traffic Study Report* (Parsons, Draft 2013 and Final 2014) using Federal Highway Administration’s Surface Transportation Efficiency Analysis Model (STEAM), 2.0. The TSM Alternative was estimated to accrue benefits totaling $1.67 billion over a 20-year life cycle from 2020 to 2040. By comparison, the build alternatives were estimated to accrue $10.89 billion to $9.97 billion for the freeway/expressway with and without tolls, respectively.

## *Cost Estimates*

Cost estimates were developed by Caltrans for the *Project Report*. The preliminary cost estimate for a 63-mile-long build alternative involving a new freeway/ expressway is approximately $3.59 billion. While the cost estimate for the TSM

Alternative would be lower than any of the build alternatives, the overall public benefit of the TSM Alternative would be the lowest.

Due to the length (more than 50 miles) and complexity of the project, and due to the need for funding support to be identified, construction of the project would need to be temporally phased, with construction being developed for logically defined segments within the entire corridor. The TSM Alternative would be conducive to such a phased approach, given that it includes lower-cost roadway improvements that can be easily packaged into individual construction contracts; however, the same funding constraints would apply to the build alternatives, so there is no major comparative benefit to the TSM Alternative in this regard. A substantial negative with regard to the TSM Alternative would be to use public funding in support of a project that would result in major out-of-direction travel for eastbound motorists from Palmdale wishing to go north on I-15 and westbound motorists wishing to go south on SR-14.

Based on the above, the TSM Alternative was assessed for potential full analysis in the Draft Environmental Document for the project in comparison to the build alternatives. As discussed above, the TSM Alternative under evaluation was considered to be enhanced and comparable to the build alternatives because it included components that went beyond the typical, relatively low-cost measures (e.g., traffic light synchronization) to improve the operational efficiency of existing highway facilities.

### *Conclusion*

Based on the evaluation presented above and as illustrated in the reasons listed below, the TSM Alternative was not recommended for further analysis in this EIR/EIS. It was ultimately rejected from further study mainly because it did not in any way address the project's purpose and need. The rationale behind this decision is summarized below:

1. Connectivity. The TSM Alternative would not address the need for a continuous, direct east-west connection between the developed areas of the southern Antelope and Victor valleys.
2. Mobility. The TSM Alternative would only partially address the need for improved mobility within the corridor because vehicular traffic would still be required to transition between rural highway, local arterials, expressway, and freeway facilities. As under current conditions, motorists' mobility would be challenged by speed limit changes, traffic signal- and stop-controlled intersections, and direct-access points (e.g., driveways and local roadways) that impede traffic flow.
3. Level of Service and Congestion. The TSM Alternative would not adequately address systemic conditions that contribute to existing and future traffic congestion.
4. Safety. The TSM Alternative would not address the need for improved safety and reliability across the entire corridor.
5. Regional Transportation System Accessibility. The TSM Alternative would not achieve a high level of accessibility to the regional transportation system because it would rely on an existing indirect and discontinuous route across the region.

## 2.8 Other Action(s) Related to the Proposed Project

**Agreement with LAWA:** LAWA is the owner of a substantial amount of land located east of 15th Street East, which includes the current location of the Palmdale Regional Airport. Caltrans and LAWA have negotiated which portion of LAWA-owned land would be most logical for extending eastward from 15th Street East, the ultimate alignment of the transportation corridor beginning at SR-14 and Avenue P-8. This alignment would generally run east-west along the southern border of LAWA, from 15th Street to 100th Street East. A Cooperative Agreement was signed between Caltrans and LAWA on April 2003.

**Replacement Parking for Rockview Nature Park:** In San Bernardino County, coordination between City of Victorville and LADWP would be necessary to address Rockview Park's unpaved parking lot. Rockview Park's existing unpaved parking lot is located within an LADWP parcel, which is currently leased from this electric utility. Caltrans would have to coordinate with LADWP about the acquisition of this parcel for the project at a later date. To offset the parking loss, added parking is proposed to help enhance access to Rockview Park to minimize any potential project effects to this park due to the acquisition of LADWP's land for the HDC.

**California High-Speed Rail:** A Program Draft EIR/EIS was prepared, which identified the California High-Speed Rail Authority as the entity responsible for determining and analyzing the various alternatives (i.e., alignments) for the HSR. Project-specific alignment alternative studies are currently underway for logical segments of the San Francisco/Sacramento to Los Angeles HSR facility. One such alternative proposes a southern mountain crossing where Bakersfield would be linked to Antelope Valley. An Antelope Valley station stop proposed near the Palmdale Transit Center off Sierra Highway would be a key hub for bus, rail, and commuters. Such a station stop would provide connectivity and accessibility to the Antelope Valley population and would service long-distance commuters to Los Angeles.

**XpressWest:** The XpressWest High-Speed Passenger Train Project is a proposed passenger rail service that would provide transportation along a 200-mile corridor between Victorville and Las Vegas, Nevada. The project would be constructed as a grade-separated, double track in the median of I-15 or parallel to I-15. A station stop is proposed near Dale Evans Parkway on the west side of I-15 in Victorville. Coordination with the Federal Railroad Administration (FRA) would be necessary to ensure there are no conflicts at I-15 where the HDC crosses.

## 2.9 Permits and Approvals Needed

It is anticipated that the proposed project may require the federal approvals and permits listed in Table 2-7.

## Table 2-7 Project Permits and Approvals

| Agency | Permit/Approval | Status |
|---|---|---|
| United States Fish and Wildlife Service (USFWS) | Biological Opinion | Threatened and Endangered Species Act Section 7 consultations are to be conducted following identification of a Preferred Alternative. |
| United States Army Corps of Engineers (USACE) | Clean Water Act Section 404 Permit for the discharge of dredge or fill materials into waters of the U.S. | Application to be submitted following identification of a Preferred Alternative. |
| Federal Emergency Management Agency (FEMA) | Conditional Letter of Map Revision and Letter of Map Revision | Coordination with FEMA during the design phase to ensure improvements are compatible with the floodplain. |
| Federal Highway Administration (FHWA) | Air Quality Conformity Determination | Before approval of the Final EIR/EIS, FHWA must make a finding that the project is consistent with requirements of the Clean Air Act (CAA). |
| Federal Aviation Administration (FAA) | FAA's Obstruction Evaluation/Airport Airspace Analysis process | Coordination with FAA during project design to ensure project features or mitigation measures would not obstruct airport/air space activities. |
| Department of Interior Bureau of Land Management | Paleontological Resource Use Permit | To be submitted for the potential to encounter paleontological resources on Bureau of Land Management property during construction. |
| California State Water Resources Control Board | Water Discharge Permit, approval of NOI to comply with General Construction Activity National Pollutant Discharge Elimination System (NPDES) Permit (Clean Water Act Section 402) | NOI to be submitted following identification of a Preferred Alternative and prior to construction. |
| California Department of Fish and Wildlife (CDFW) | Section 1602 Lake or Streambed Alteration Agreement | Section 1602 Notification is to be submitted and agreement obtained prior to the start of construction. |
| Region 6, Lahontan Regional Water Quality Control Board (RWQCB) | Water Quality Certification (Clean Water Act Section 401) | Application to be submitted following approval of a Preferred Alternative. |
| State Historic Preservation Officer (SHPO) | Approval of a Memorandum of Agreement (MOA) with FHWA | SHPO approval of the MOA will occur after a Preferred Alternative is identified prior to completion of the Final EIR/EIS. |
| Interested Native American Tribes | Section 106 of the National Historic Preservation Act (NHPA) to include, but not be limited to, determinations of eligibility, findings of effect, and future work that includes involvement with the MOA, Archaeological Monitoring Plan, and Data Recovery Plan | Native American Consultation for the HDC is ongoing. |

| Agency | Permit/Approval | Status |
|---|---|---|
| Burlington Northern Santa Fe (BNSF) Railroad Company | Memorandum of Understanding (MOU) and a Construction and Maintenance Agreement between Caltrans and BNSF; approval of the proposed action, based on review of the Construction and Maintenance Agreement between Caltrans and BNSF | Prior to any construction within or above railroad ROW. |
| California Public Utilities Commission (CPUC) | General Order 131-D for relocation of electrical transmission lines between 50 and 20 kilowatts (kW); Certificate of Public Convenience and Necessity for relocations to electrical transmission lines and gas lines | Prior to any construction within or above railroad ROW; after certification of EIR/EIS and the filing of a Notice of Determination to complete the CEQA process. |
| Local Air Pollution Control Districts | Dust Control Permit and Approved Air Impact Assessment per Rule 9510, Indirect Source Review; Rule 8210, Limits to fugitive particulate matter emissions during construction activities | Permit to be acquired after project approval and prior to construction. |
| Utilities (e.g., power, water, gas, cable, communication) | Approvals to relocate, protect in place, or remove utility facilities | Prior to any construction activities that would affect utility facilities. |
| San Bernardino Flood Control District | Floodplain Encroachment Permit | During final design. |

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