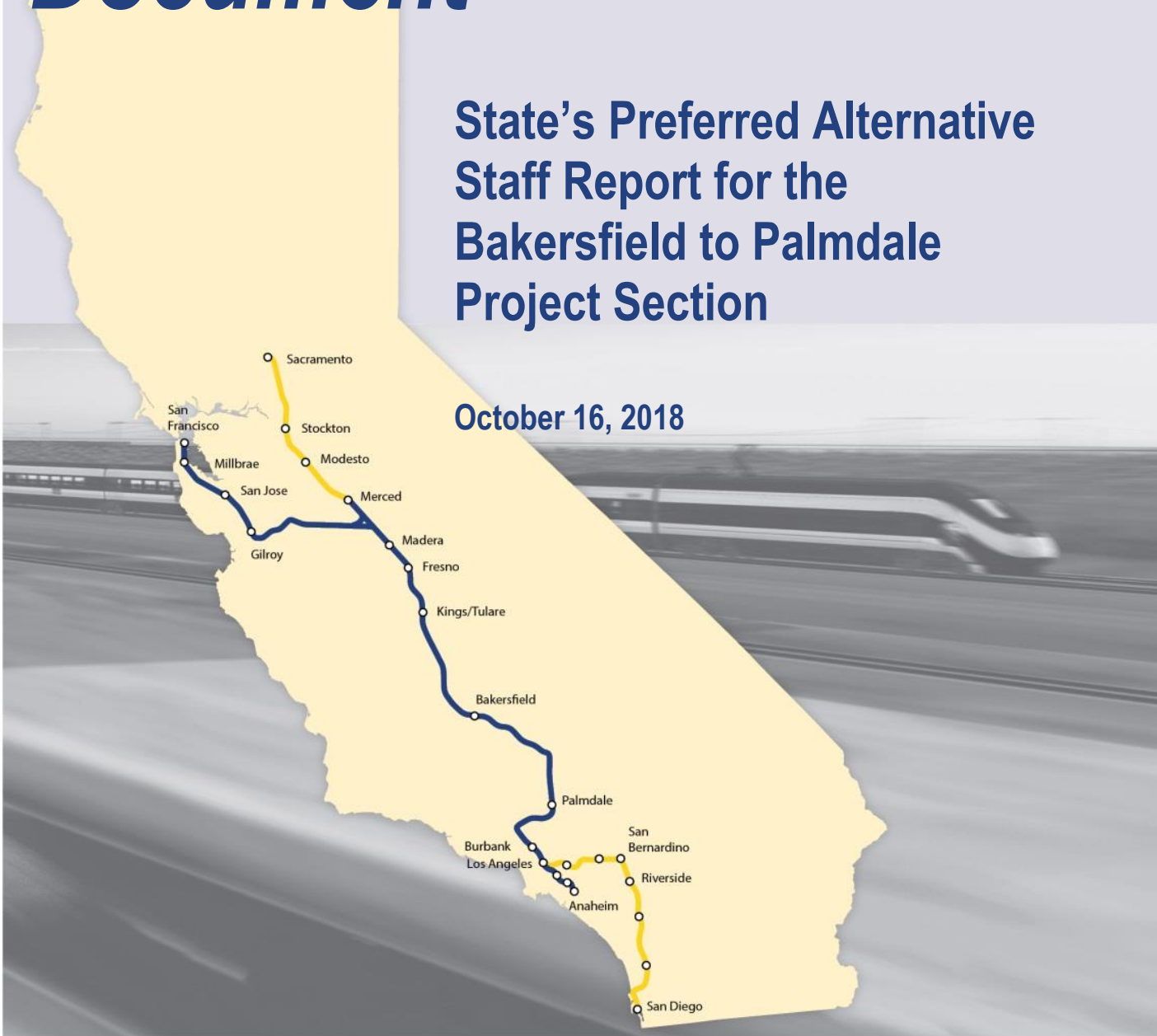


California High-Speed Rail Authority

# *Project Environmental Document*

**State's Preferred Alternative  
Staff Report for the  
Bakersfield to Palmdale  
Project Section**

**October 16, 2018**





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## ACRONYMS AND ABBREVIATIONS

Authority	California High-Speed Rail Authority
BLM	Bureau of Land Management
CEQA	California Environmental Quality Act
CCNM	César Chávez National Monument
EIR	environmental impact report
EIS	environmental impact statement
EPA	Environmental Protection Agency
FRA	Federal Railroad Administration
HSR	high-speed rail
IAMF	Impact Avoidance and Minimization Feature
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
PAA	Preliminary Alternatives Analysis
PCT	Pacific Crest Trail
PCTA	Pacific Crest Trail Association
PA	Preferred Alternative
ROD	Record of Decision
SR	State Route
SAA	Supplemental Alternatives Analysis
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USFS	United States Forest Service



## 1. INTRODUCTION

### 1.1 Purpose

This report has been prepared by the staff of the High-Speed Rail Authority (Authority). Its purpose is to present the rationale for identifying Alternative 2 as the staff-recommended State's Preferred Alternative (PA), which will be identified in the Bakersfield to Palmdale Draft Environmental Impact Report/Draft Environmental Impact Statement (EIR/EIS). Further, staff recommends incorporation of the CCNM Design Option in the Preferred Alternative in the Bakersfield to Palmdale Draft EIR/EIS introduced as part of the Section 106 consultation process related to the César Chávez National Monument (CCNM).

This staff report refers to the staff-recommended State's Preferred Alternative because it has not yet received High-Speed Rail Authority (Authority) Board of Directors or Federal Railroad Administration (FRA) concurrence. Authority staff will present this report to the Authority Board of Directors at the October 16, 2018 Board Meeting. This meeting will provide an opportunity for the Board Members to offer input and direction to staff regarding the preferred alternative. If the Board concurs with the staff report and recommendation, Alternative 2 with CCNM Design Option will be presented to the FRA for concurrence. If the FRA concurs, then Alternative 2 with CCNM Design Option will also be identified in the Draft EIR/EIS as the FRA NEPA Preferred Alternative.

The staff report and board concurrence do not in any way represent a final decision by the Authority on selection of the Preferred Alternative. At the conclusion of the public comment period on the forthcoming Draft EIR/EIS (anticipated mid-2019), and after consideration of these comments, the Authority will determine whether to certify the Final EIR, adopt necessary findings and take action to approve Alternative 2 with the CCNM Design Option or another alternative for the Bakersfield to Palmdale Project Section.

### 1.2 Preferred Alternative Approach

The approach of presenting a staff-recommended State's Preferred Alternative in the Draft EIR/EIS represents a change in process for the Authority, as compared to what was done in the 2012 and 2014 for the Merced to Fresno (M-F) and Fresno to Bakersfield (F-B) project sections. In the M-F and F-B environmental documents, the Authority identified the Preferred Alternative after the Authority and FRA issued the Draft EIR/EIS and received public comments, but before issuance of the Final EIR/EIS. The Authority modified that approach in 2016/2017 by obtaining Board concurrence on the Bakersfield area "Locally-Generated Alternative" as the preferred alternative, which was then identified as such in the 2017 Draft Supplemental EIR/EIS to the 2014 Fresno to Bakersfield Final EIR/EIS. The Authority is now taking a similar approach for the Bakersfield to Palmdale Project Section.

The Authority believes this approach facilitates a more effective public comment period, allowing the public, stakeholders and public agencies to have more time to focus their attention and comments, if they so choose, on the Preferred Alternative. This approach also aligns more closely with recent federal transportation laws which encourage the federal transportation modal administrations to name a Preferred Alternative in the Draft EIS project development phase rather than the Final EIS. This process also more closely follows standard California Environmental Quality Act (CEQA)<sup>1</sup> approaches, under which a Draft EIR identifies and defines the proposed project (which is conceptually equivalent to a Preferred Alternative).

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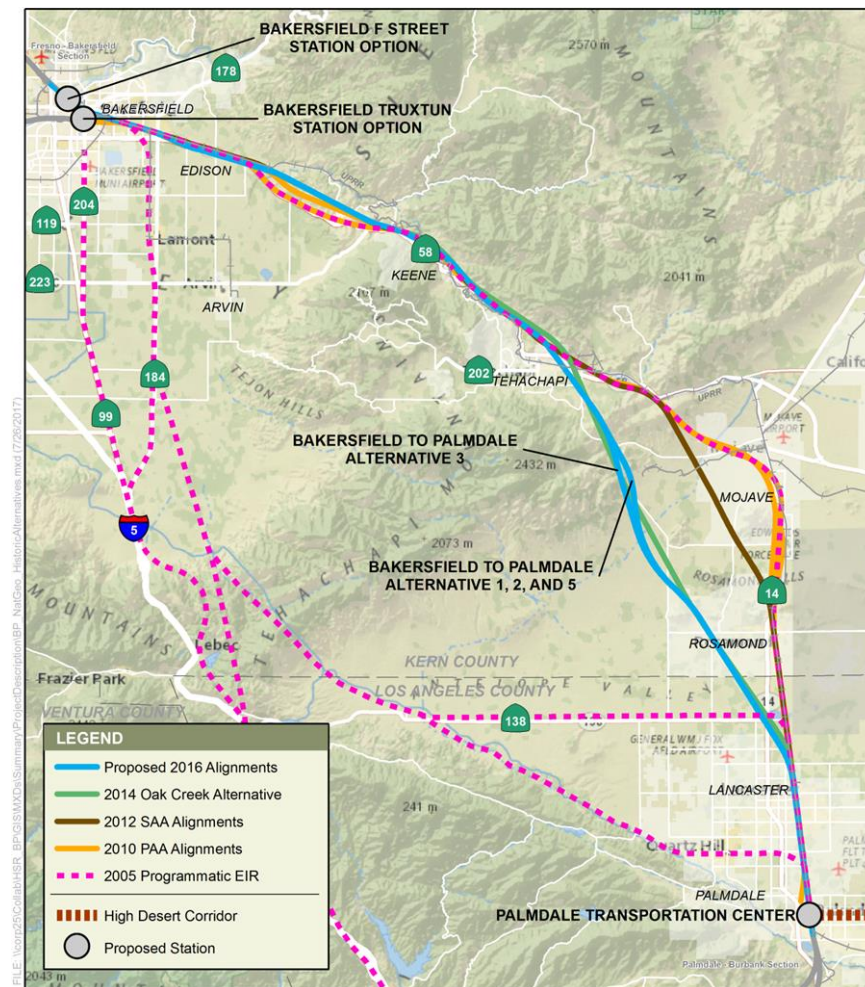
<sup>1</sup> Pubic Resources Code (2100-21189)

## 2 PROJECT ALTERNATIVES

### 2.1 Alternatives Development

Following completion of the *Final Program EIR/EIS for the Proposed California High Speed Rail (HSR) System (2005)*, the Authority and the Federal Railroad Administration (FRA) advanced the Bakersfield to Palmdale Project Section for further study. The Authority and FRA issued a Notice of Intent and a Notice of Preparation (published in 2009) for the Bakersfield to Palmdale Project Section to signify their desire to develop an EIR/EIS. The Authority then performed public scoping in 2009, working closely with community members, stakeholders, and agencies to ensure the scope of the EIR/EIS was comprehensive.

Following scoping, the Authority and FRA, guided by the project Purpose and Need and the project objectives, conducted further planning studies to analyze potential alignments between Bakersfield and Palmdale. These analyses are recorded in the 2010 Preliminary Alternatives Analysis Report, the 2012 Supplemental Alternatives Analysis Report, and the 2016 Supplemental Alternatives Analysis Report. See Figure 1, and the detailed discussion below, for an overview of alternatives considered to date.



**Figure 1 Bakersfield to Palmdale Project Section—Alignments Evaluated**



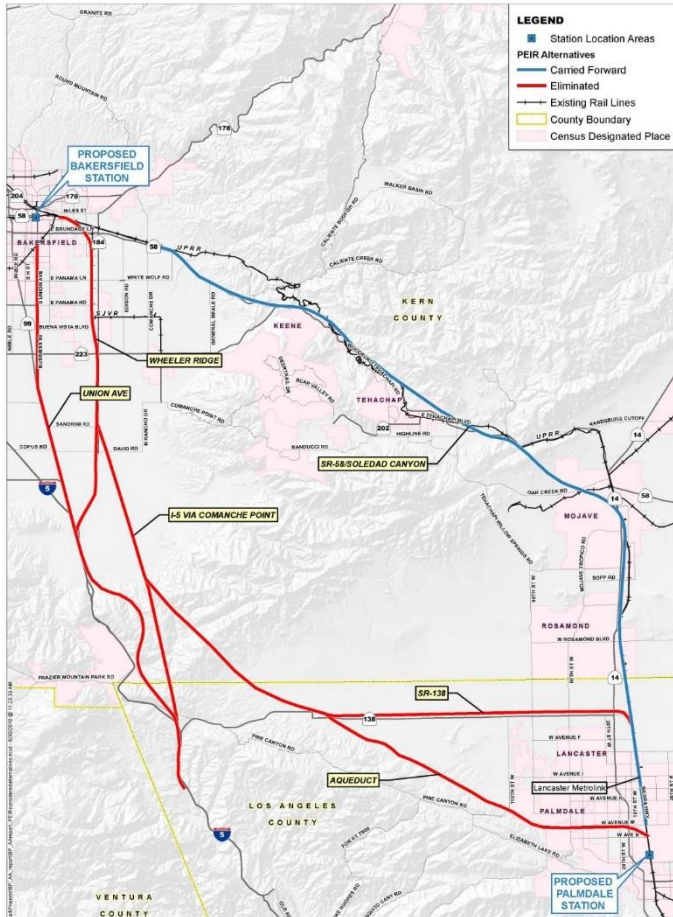
### **Statewide Program EIR/EIS**

At the conclusion of the Statewide Program EIR/EIS, the Authority and FRA defined a broad corridor between Bakersfield and Los Angeles, which was further divided into two project sections: (1) Bakersfield to Sylmar and (2) Sylmar to Los Angeles. In turn, as part of the project-level environmental review process, the Bakersfield to Sylmar segment was further subdivided into the Bakersfield to Palmdale Project Section and the Palmdale to Los Angeles Project Section.

The screening evaluation conducted as part of the Statewide Program EIR/EIS considered six general alignment corridors for the Bakersfield to Sylmar segment:

- SR 138 (Soledad Canyon or SR 14)
- Aqueduct (Soledad Canyon or SR 14)
- I-5 via Comanche Point
- I-5 (2.5 percent maximum grade) (Union Avenue or Wheeler Ridge)
- I-5 (3.5 percent maximum grade) (Union Avenue or Wheeler Ridge)
- SR 58/Soledad Canyon

As a result of the screening evaluation, the SR 138, Aqueduct, I-5 via Comanche Point, and I-5 (2.5 percent maximum grade) corridors were eliminated from study in the Statewide Program EIR/EIS. Of the remaining alignments, the SR 58/Soledad Canyon Corridor (Antelope Valley) was identified as the preferred alignment because it would have fewer potential environmental impacts, be less subject to seismic activity, and have considerably less tunneling (and thus fewer constructability issues and lower construction costs) than the I-5 (3.5 percent maximum grade) alignment options (i.e., Union Avenue or Wheeler Ridge).



**Figure 2 2005 Statewide Program EIR/EIS – Alignments Carried Forward**

### **2010 Preliminary Alternatives Analysis (PAA) Report**

The 2010 PAA (Authority 2010c) for the Bakersfield to Palmdale Project Section identified feasible and practicable HSR study alternatives to carry forward for environmental review and evaluation in the Draft EIR/EIS under CEQA and NEPA. The 2010 PAA broke down the Bakersfield to Palmdale Project Section Statewide Program EIR/EIS Preferred Alignment into three subsections: Edison, Tehachapi, and Antelope Valley. For each subsection of the Bakersfield to Palmdale Project Section, the Authority conducted agency and community outreach to help identify alternatives for further development as part of the project-level environmental process. An initial evaluation of alternatives was conducted to narrow the range of alternatives to be evaluated in detail, resulting in four alternatives in the Edison Subsection, four alternatives in the Tehachapi Subsection, and five alternatives in the Antelope Valley Subsection. These initial alternatives were based on the Statewide Program EIR/EIS Preferred Alignment and alternatives proposed during public scoping.

The following alternatives were carried forward in the 2010 PAA:

#### **Edison Subsection**

- Alternative E2A: SR 58 Adjacent North Side (Partially Elevated)
- Alternative E2B: SR-58 Adjacent North Side (All Elevated)
- Alternative E4: Along Edison Highway, Through Town of Edison (All Elevated)

*Alternative E3 was withdrawn because it would require a 2-mile realignment of SR 58 and reconstruction of multiple overpasses (and their associated impacts) leading to the highest capital cost and longest length of elevated alignment.*

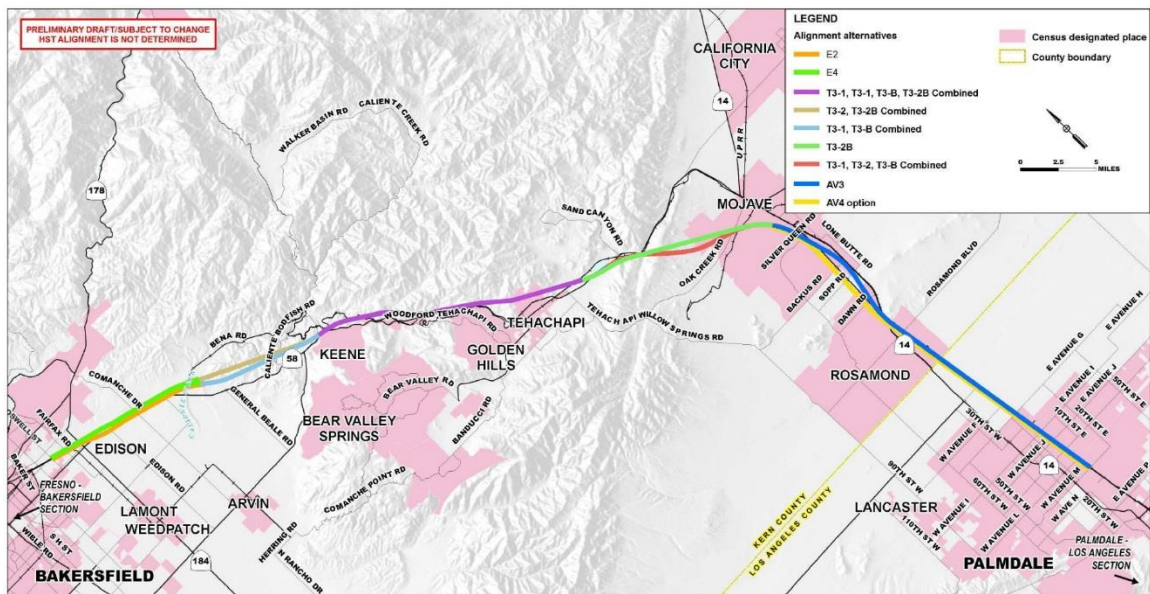
Tehachapi Subsection

- Alternative T3-1 – Quantm-Generated Alignment
- Alternative T3-2 – Modified Quantm-Generated Alignment
- Alternative T3-B – Phase Break Alignment
- Alternative T3-2B – Revised Phase Break Alignment

Antelope Valley Subsection

- Alternative AV3B: Between UPRR and Sierra Highway (Partially Elevated)
- Alternative AV4 Option: Within or Adjacent to Sierra Highway – Completely avoids UPRR Right-of-way (Primarily Elevated)

*Alternatives AV2, AV3A, and AV4 were withdrawn due to their potential displacement of commercial properties and high capital cost.*



**Figure 3 2010 PAA – Alternatives Carried Forward**

**2012 Supplemental Alternatives Analysis (SAA) Reports**

The 2012 SAA documented additional evaluation, development, and refinement of the alignment alternatives; it also recommended modifications to the 2010 PAA alternatives to be recommended for further study. The SAA focused on avoiding potential environmental impacts and overall project costs, specifically: potential land-use conflicts, environmental resources, and stakeholder input. In addition, the SAA analyzed costs associated with elevated profiles and tunneling, and made an effort to bring profiles closer to grade where possible.

The refinements to the conceptual engineering, conducted from September 2010 to December 2011, addressed concerns from stakeholders, minimized impacts to environmental resource and to existing and planned developments, and reduced costs.

The following alternatives were carried forward in the 2012 SAA:

### Edison Subsection

- Alternative Preliminary AA E2B and New E2 were carried forward to develop the optimal profile, in collaboration with Caltrans and Kern County, for E2.
- Alternative Preliminary AA E4 and New E4 were carried forward to develop the optimal profile and minimize impacts to the community of Edison and agricultural businesses.

*Alternative Preliminary AA E2A was withdrawn from further consideration because it caused more extensive reconstruction of multiple SR-58 interchanges.*

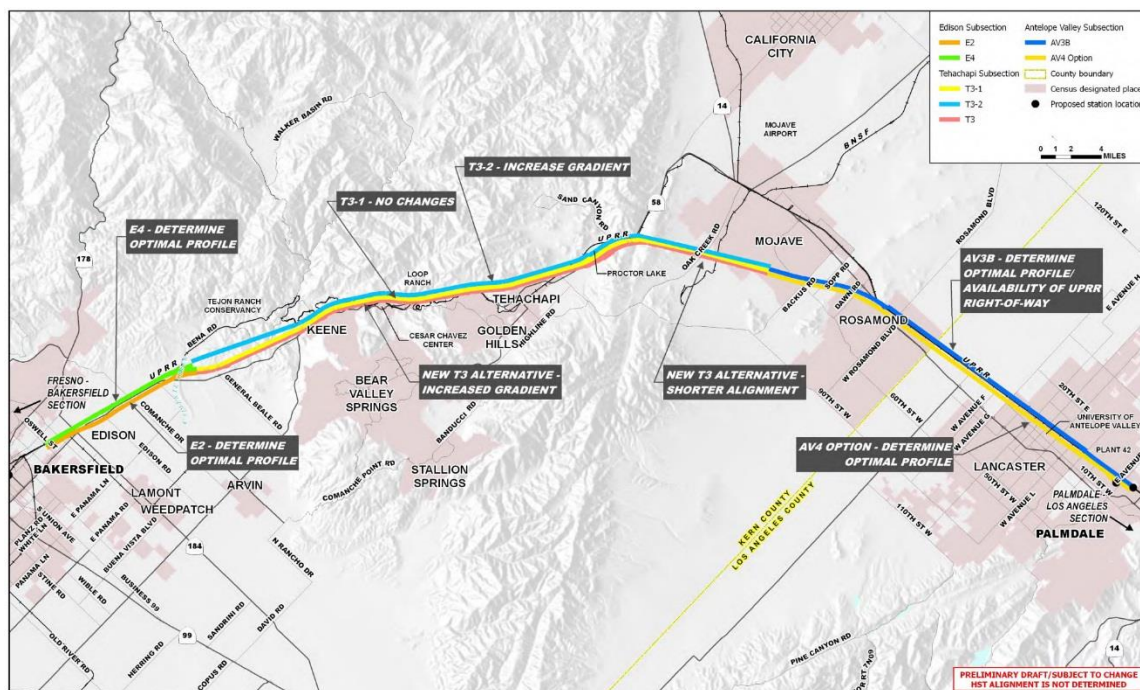
### Tehachapi Subsection

- Alternative New T3 was carried forward because it limits the length of tunnels and viaduct relative to other PAA alternatives.
- Preliminary AA Alternative T3-1, and a refined Preliminary Alternative AA T3-2 using the same gradient variances as applied to the design of Alternative New T3 were carried forward to assess potential environmental impacts and benefits associated with viaducts and tunnels.

*Preliminary AA Alternatives T3-B, T3-2B, T3-1 and T3-2 in the Mojave area were withdrawn from further consideration.*

### Antelope Valley Subsection

- Preliminary AA Alternatives AV3B and New AV3B, as well as Preliminary AA AV 4 Option and New AV4 Option, were carried forward to determine the optimal profile, and whether shared use of the UPRR right-of-way was possible.



**Figure 4 2012 SAA – Alternatives Carried Forward**



## **2016 Supplemental Alternatives Analysis (SAA) Report**

The 2016 SAA was prepared to further refine the alternatives introduced in the 2012 SAA. The 2016 SAA analyzed a range of alternatives within the communities along the alignment: Edison, Keene, Tehachapi, and Lancaster. The range of alternatives was selected based on each alternative's ability to meet the project's purpose, need, and objectives. An alternative screening memorandum was prepared as part of the 2016 SAA which resulted in combining subsection alternatives into a total of eight end-to-end alternatives (Alternative 1-8) from Bakersfield to Palmdale.

Alternatives 1-8 presented differences in operating and capital costs; consistency with existing planning efforts; tunneling miles required; direct and indirect potential impacts to communities; environmental, recreational, cultural, and historical resources; and constructability. The alternatives were developed based on the Authority's refinement objectives as well as additional public input received during open house meetings in September and October 2015.

The 2016 SAA recommended the following changes to the alignments that were carried forward out of the 2012 SAA:

### Edison

- Travel within Edison Highway rather than along private properties to the south of Edison Highway
- Move further from Edison Middle School and agricultural features
  - Preserve school and packing houses
  - Move away from existing fault zone paralleling SR 58
- Match existing grade between Edison Road and Caliente Creek

### Tejon Conservancy

- Alignments now follow the existing conservation easement boundary rather than bisecting its northeastern corner
  - Shorten length of section
  - Flatten grade ascending the Tehachapis

### Tehachapi Mountains

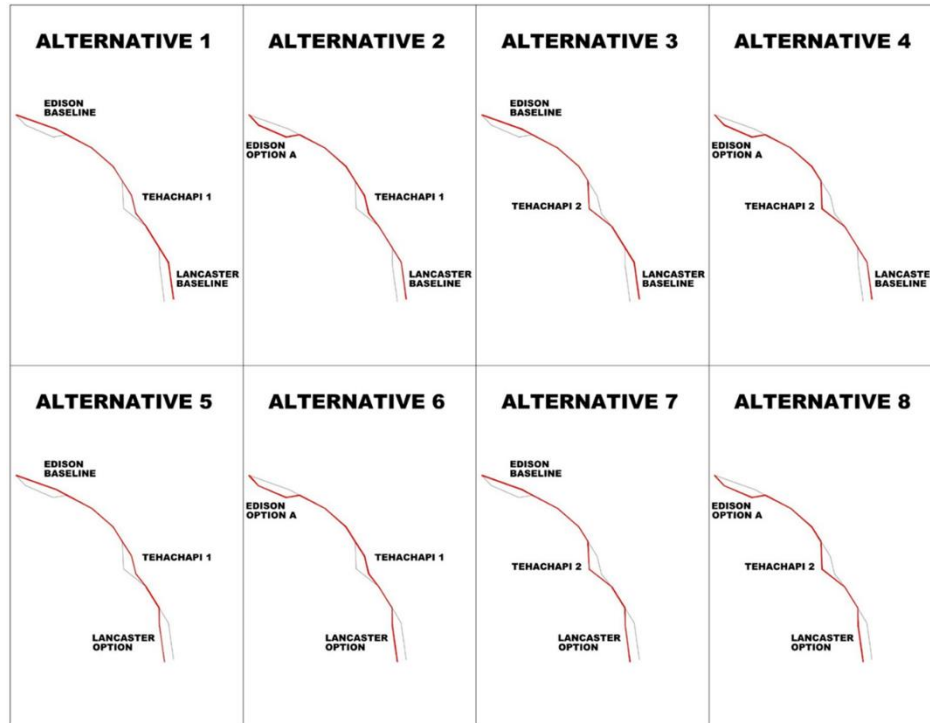
- Refine design to minimize tunneling and reduce grade
- Reduce impacts to new development areas around the City of Tehachapi

### Kern County

- Reduce impacts to green energy generation and aerospace facilities
- Reduce length, cost, and travel time
- Reduce impacts in unincorporated and disadvantaged communities

### Lancaster

- Travel within Sierra Highway/Rail Corridor at grade
- Maintain character of Lancaster Boulevard
- Improve regional mobility and connectivity (freight, passenger rail, transit, active transportation)



**Figure 5 2016 SAA – Alternatives Considered**

Based on the analysis in the 2016 SAA, Alternatives 1, 2, 3, and 5 were found to generally be more constructible (fewer tunnel miles and lower capital costs) and generally have fewer potential effects on right-of-way, cultural resources, and community resources when compared to Alternatives 4, 6, 7, and 8. As a result, Alternatives 1, 2, 3 and 5, were carried forward and are currently being studied in the Draft EIR/EIS (see Figure 6 for visual representation of current HSR Build Alternatives).

### **Summary of Alternatives Development**

The 2005 Program EIR/EIS identified SR 58/Soledad Canyon as the preferred corridor. In this study, a broad range of alignments along the I-5, SR 58, and SR 138 corridors were analyzed. The analysis concluded that SR 58 had fewer potential environmental impacts, required fewer miles of tunnel, and possessed lower levels of seismic activity. As such, the SR 58 corridor was carried forward for further development and refinement, and development of specific alignment footprints, to occur via a project-level (Tier 2) EIR/EIS.

The 2010 PAA introduced an initial range of project-level alternatives based on the corridor identified in the 2005 EIR/EIS. Thirteen alternatives were developed to assess potential environmental effects associated with construction, operation, and maintenance of HSR along the SR 58 corridor. The alternatives were divided into three subsections: Edison Subsection, Tehachapi Subsection, and Antelope Valley Subsection. During the development of these alternatives, the Authority engaged with local representatives and public agencies, business and agricultural interests, the general public, and the communities throughout the corridor to solicit feedback on and input into the alternatives development process. Four alternatives were withdrawn based on preliminary analysis indicating that they would have significant traffic and community impacts. The remaining eleven alternatives were carried forward to be studied further.

The 2012 SAA refined the range of alternatives carried forward in the 2010 PAA. Seventeen alternatives were studied, including those carried forward in the PAA and several new alternatives, to address concerns from stakeholders, minimize and avoid environmental impacts, reduce impacts to existing and planned developments, and contain costs. Specifically, the alternatives under consideration shifted from the community of Mojave in order to reduce community impacts. Twelve alternatives were carried forward to be studied further.

The 2016 SAA introduced new refinements based on concerns voiced by residents and stakeholders in Edison, Keene, Tehachapi, and Lancaster. Further, the 2016 SAA grouped alternatives. This resulted in refined alternatives that moved further west in the Rosamond area to reduce impacts to community resources, solar energy and wind power facilities; these refinements also reduced the overall length of the alignment. The 2016 SAA, concluded that subsection alternatives should be combined, which resulted in a total of eight end-to-end alternatives (Alternatives 1-8).

Based on the analysis in the 2016 SAA, Alternatives 1, 2, 3, and 5 were found to generally have fewer right-of-way impacts, fewer displacements, fewer impacts to cultural resources, and reduced impacts to community resources. Further, these alternatives were found to be generally more constructible, having fewer tunnel miles and lower capital costs associated with them, when compared to Alternatives 4, 6, 7, and 8. As a result, Alternatives 1, 2, 3 and 5, were carried forward to be studied in greater detail in the Draft EIR/EIS.



Figure 6 HSR Build Alternatives Overview



## 2.2 Alternatives Evaluated in EIR/EIS

This section summarizes the alternatives that are currently being evaluated in the Bakersfield to Palmdale Draft EIR/EIS. This section also includes information on the CCNM Design Option, which was introduced as part of the Section 106 consultation process related to the César Chávez National Monument. The four HSR Build Alternatives (1, 2, 3, and 5) begin at the Bakersfield Station in the City of Bakersfield and end at the Palmdale Station in the City of Palmdale. Each would extend approximately 80 miles between the proposed Bakersfield and Palmdale stations. The estimated trip time between Bakersfield Station and the Palmdale Station would be approximately 31 minutes traveling southbound, and 28 minutes traveling northbound. Table 1 provides a high-level comparison of key design features associated with each of the alternative alignments evaluated in this Draft EIR/EIS. The CCNM Design Option is compatible with all four Build Alternatives and would have minimal effect on the overall length.

**Table 1 Summary of Design Features**

Design Features	Alternative 1	Alternative 2	Alternative 3	Alternative 5
Total Length (linear miles) <sup>1</sup>	81.3 miles	81.3 miles	81.2 miles	81.3 miles
Surface Profile (linear miles)	52.5 miles	51.7 miles	50.8 miles	52.5 miles
Elevated Profile (linear miles)	19.5 miles	20.3 miles	18.9 miles	19.5 miles
Underground Profile (linear miles)	9.3 miles	9.3 miles	11.5 miles	9.3 miles
Number of Straddle Bents	23	22	21	23
Number of Railroad Crossings	2	2	2	2
Number of Major Floodplain Crossings <sup>2</sup>	18	18	18	18
Number of Road Crossings	126	127	125	126
Number of Public and Private Roadway Closures <sup>3</sup>	49	49	50	49
Number of Roadway Overheads and Underpasses <sup>4</sup>	74	75	75	74

<sup>1</sup> Length is measured from F Street Station to Palmdale Station.

<sup>2</sup> Major floodplain crossings are Federal Emergency Management Agency floodplain crossings.

<sup>3</sup> Accounts for closures due to HSR road crossings.

<sup>4</sup> All proposed grade crossing configurations are pending California Public Utilities Commission approval.

### 2.2.1 Alternative 1

Alternative 1 would begin at the Bakersfield Station on a viaduct. From Oswell Street to Morning Drive (SR 184), the Alternative 1 centerline would be located on the north side of Edison Highway. East of Morning Drive, the Alternative 1 alignment transitions from the Edison Highway corridor to the SR 58 corridor, reaching the freeway corridor at Edison Road. At Edison Road, the freeway would be relocated to the south, allowing the HSR alignment to run within the existing freeway right of way, parallel to the relocated SR 58 alignment along the north side. The Alternative 1 alignment would continue eastbound parallel to Edison Highway toward Caliente Creek then continue southeast through the community of Keene before beginning to climb the Tehachapi Mountains. The alignment would include a combination of cuts, fills, tunnels, and viaducts through the Tehachapi Mountains, crossing SR 58 at various points. As SR 58 turns south approaching Tehachapi, Alternative 1 would continue on an easterly path, along the edge of the city. The alignment would then curve further south and pass to the east of the city. Alternative 1 would cross the Tehachapi Valley on a straight alignment and pass through the mountains southeast of Tehachapi in a tunnel. It would then proceed across the Antelope Valley through Rosamond toward the north end of the City of Lancaster.

The alignment would pass over SR 138 and SR 14 near their interchange and then enter Lancaster at Avenue H, running parallel to the Sierra Highway/Union Pacific Railroad (UPRR) corridor through Lancaster and Palmdale. From Avenue H through Lancaster, Alternative 1 would combine the HSR, UPRR, and Metrolink rail corridors into one combined corridor. Under Alternative 1, the new combined rail corridor would match the current westerly extent of the existing rail right-of-way and widens the corridor to the east, as necessary, to accommodate all three rail systems and their respective separation requirements. The alternative would require the relocation of all the UPRR and Metrolink facilities in the corridor from north of Avenue H to approximately Avenue L. The alternative would create separate rights-of-way for the UPRR and the Metrolink rail corridors to the east of the HSR right-of-way. Therefore, Alternative 1 would align east of Sierra Highway and west of the UPRR corridor. The Alternative 1 alignment would begin a transition to the west at Avenue K. It would continue this transition to Avenue M, where the HSR alignment would be situated west of the existing UPRR/Metrolink right-of-way, which would remain in its existing location. The HSR alignment would then continue south, parallel to and along the westerly side of the existing rail corridor until the section terminus at the Palmdale Station, located at the Palmdale Transportation Center.

### **2.2.2 Alternative 2**

Alternative 2 would follow the same alignment from Bakersfield to Palmdale as Alternative 1 except through the community of Edison. Alternative 2 would vary from Alternative 1 as well as Alternatives 3 and 5 between Edison Road and Towerline Road, where the HSR alignment runs along the south side of existing SR 58 on an elevated embankment. Under Alternative 2, SR 58 would remain in its current alignment, but this alternative would require an elevated structure for the HSR spanning the SR 58/Edison Road interchange diagonally. Another elevated structure crossing back over SR 58 would be necessary just past Towerline Road, and three additional elevated structures would be necessary to cross the HSR over existing north-south roads (Malaga Road, Comanche Drive, and Tejon Highway) spaced approximately one mile apart between Edison Road and Towerline Road.

Alternative 2 varies from Alternative 1, 3, and 5, as noted above, because Alternative 2 would not require relocation of State Route (SR) 58. This results in fewer effects to access and also reduces the construction time period, which reduces the duration of construction-related effects. With its location south of SR 58, Alternative 2 would be located farther away from key community resources, including Edison Middle School, low-income housing, and agricultural packing houses. This reduces effects related to noise, vibration, and access. However, due to its elevated profile, Alternative 2 would have greater visual effects in the community of Edison.

### **2.2.3 Alternative 3**

Alternative 3 would follow the same alignment from Bakersfield to Palmdale as Alternative 1 except along the southern base of the Tehachapi Mountains north of Rosamond. Alternative 3 varies from Alternative 1, 2 and 5 just south of Tehachapi, in the vicinity of the CalPortland Company quarry, where the alignment travels closer to Tehachapi Willow Springs Road. It would cross Tehachapi Willow Springs Road further west than Alternative 1, but still near the Cameron Canyon Road intersection. South of Tehachapi, Alternative 3 would split off in a more westerly direction than Alternative 1, 2 and 5 until it reconnects at the common connection point of Alternative 1, 2, and 5 approximately 17 miles south of Tehachapi.

As outlined above, Alternative 3 diverges from Alternative 1, 2 and 5 near the CalPortland mine area. This divergence results in Alternative 3 having a longer tunnel and fewer effects to wind turbines. Alternative 3 would affect future mining operations whereas Alternative 1, 2 and 5 would affect current mining operations. In addition, Alternative 1, 2 and 5 would cross one BLM parcel while Alternative 3 would cross two BLM parcels through this area.

### 2.2.4 Alternative 5

Alternative 5 would follow the same alignment from Bakersfield to Palmdale as Alternative 1 except in the City of Lancaster. Between Avenue H and Avenue M, Alternative 5 would be situated west of the existing UPRR and Metrolink facilities, avoiding the need to relocate them, except for the Lancaster Metrolink station building and parking facilities. Sierra Highway would need to be relocated west of the HSR alignment. The alternative would end at the Palmdale Station.

Alternative 5 varies from Alternative 1, 2 and 3 as noted above, because it avoids relocating existing UPRR and Metrolink facilities. However, Alternative 5 would require Sierra Highway to be relocated in the Lancaster area. These variances result in Alternative 5 having more significant residential and commercial displacements than Alternative 1, 2, and 3. The alignment of Alternative 5 would result in permanent effects to two sites in the Lancaster area that are protected under Section 4(f) of the U.S. Department of Transportation Act of 1966: Whit Carter Park and Denny's #30 (Village Grille). In contrast, Alternative 1, 2, and 3 would avoid these effects.

### 2.2.5 CCNM Design Option

All alternatives resulting from the 2016 SAA (i.e., Alternatives 1, 2, 3 and 5 described above) would pass the César Chávez National Monument (CCNM)/Nuestra Señora Reina de La Paz National Historic Landmark while traversing the Tehachapi Mountains in Keene, approximately 30 miles southeast of Bakersfield. The CCNM, established in 2012, is historically significant and serves as the headquarters of the United Farm Workers (UFW) and was the residence of UFW founder and labor leader César Chávez.

The Authority, based on analysis contained in the draft Section 106 Finding of Effect Report (FOE) and numerous and ongoing consultation efforts with the César Chávez Foundation, National Park Service, and other consulting parties (see 2.3.2 below), has developed a preliminary impact minimization design option (the "CCNM Design Option") to lessen potential effects (noise and visual) associated with the existing Build Alternatives in the vicinity of the CCNM. Analysis for the CCNM Design Option will be included in the Draft EIR/EIS, and will allow for a comprehensive comparison between alternatives.

As currently designed, the CCNM Design Option northern and southern termini would be located approximately 1.05 miles northwest of the East Bear Mountain Boulevard/State Route 58 intersection in Keene and approximately 0.04-mile northeast of Burnett Road in Tehachapi, respectively. The design option would move the alignment approximately 440 feet farther away from the CCNM than the current alignment, resulting in a total separation distance of over 800 feet. The minimization option would also lower the height of the viaduct approximately 15 feet.

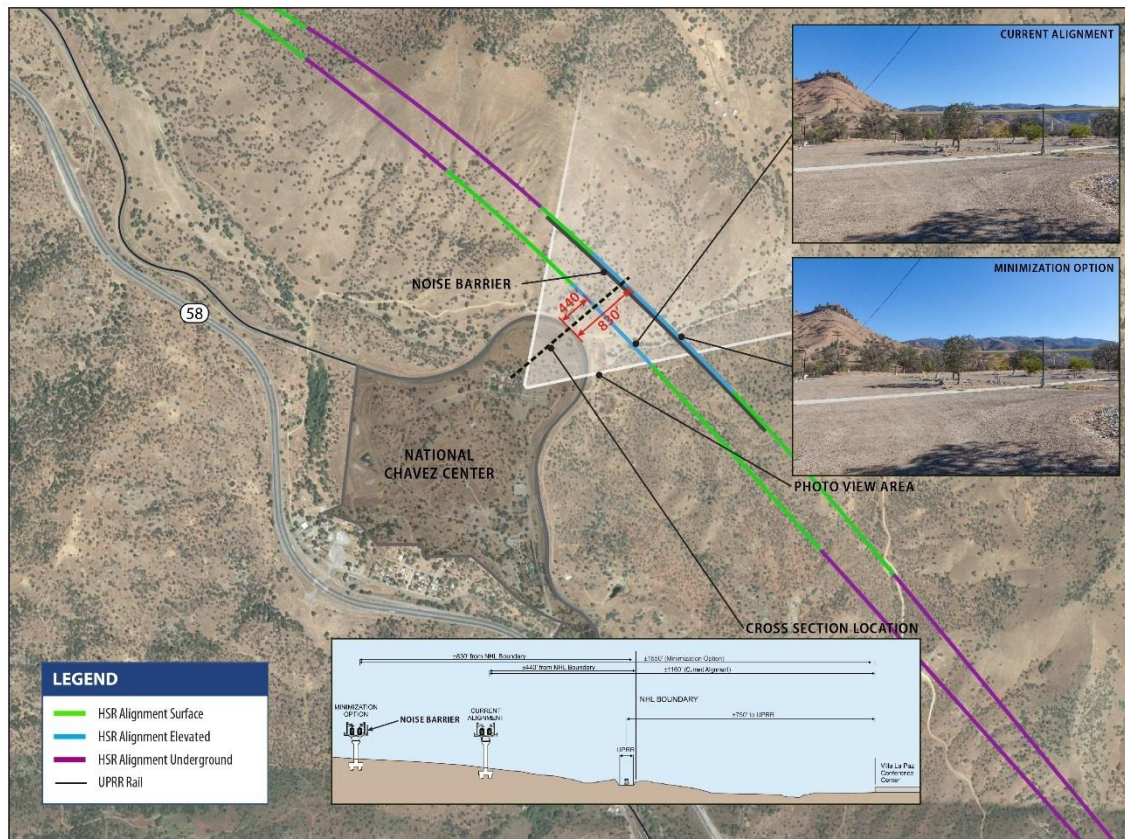


Figure 7 CCNM Design Option Overview

## 2.3 Public and Stakeholder Engagement

### 2.3.1 Public Outreach and Stakeholder Engagement

Since the last SAA document was completed in 2016, Stakeholder Working Group meetings and Community Open House outreach events were held in the communities of Edison and Rosamond, and the cities of Tehachapi, Lancaster, and Palmdale. Table 2 (below) includes additional details regarding the outreach conducted to date.

Table 2 Past Working Group and Open Houses

Date	Meeting
March 22, 2016	Edison Stakeholder Working Group Meeting
March 22, 2016	Crossing (Tehachapi) Stakeholder Working Group Meeting
March 24, 2016	North Antelope Valley (Rosamond) Stakeholder Working Group Meeting
March 24, 2016	Lancaster Stakeholder Working Group Meeting
June 28, 2016	Edison Stakeholder Working Group Meeting
June 28, 2016	Crossing (Tehachapi) Stakeholder Working Group Meeting



Date	Meeting
June 29, 2016	North Antelope Valley (Rosamond) Stakeholder Working Group Meeting
June 29, 2016	Lancaster Stakeholder Working Group Meeting
July 19, 2016	Edison Community Open House Meeting
July 20, 2016	Tehachapi Community Open House Meeting
July 21, 2016	Lancaster Community Open House Meeting
July 26, 2016	Rosamond Community Open House Meeting
January 10, 2017	Crossing (Tehachapi) Stakeholder Working Group Meeting
January 10, 2017	Edison Stakeholder Working Group Meeting
January 11, 2017	Palmdale Stakeholder Working Group Meeting
January 12, 2017	North Antelope Valley (Rosamond) Stakeholder Working Group Meeting
January 12, 2017	Lancaster Stakeholder Working Group Meeting
January 25, 2017	City of Lancaster Open House
February 1, 2017	Tehachapi Community Open House Meeting
February 2, 2017	Edison Community Open House Meeting
February 7, 2017	Palmdale Community Open House Meeting

Based on the scoping meetings and public outreach efforts throughout the environmental review process, the staff has identified the following as areas of concern:

- Potential for Valley Fever
- Impacts on:
  - 1) Special-status plants, wildlife and wildlife habitat preserves, wildlife migration, and natural lands;
  - 2) Corridor communities (including noise, visual quality impacts, loss of community character and cohesion, impacts to low-income and minority populations, and right-of-way acquisition);
  - 3) Farmlands and Native American lands;
  - 4) Edison Highway;
  - 5) De-Facto Affordable Housing (motels) along Sierra Highway;
  - 6) Pedestrian and equestrian access to local trails;
  - 7) Green energy generation facilities, military and aerospace facilities, and recreational facilities;
  - 8) The Exotic Feline Breeding Compound in Rosamond;
  - 9) Seismic safety, drainage, flooding, and water wells safety;
  - 10) Air quality; and
  - 11) Economic growth impacts.

### 2.3.2 Agency Consultation

The Authority and FRA have consulted with cooperating and participating agencies under NEPA and with trustee and responsible agencies under CEQA regarding specific resource areas associated with these agencies. Interested local, state, and federal agencies have also been consulted throughout the process. Since January, 2015, the Authority has held monthly regulatory agency meetings to discuss the Southern California Project Sections, including the Bakersfield to Palmdale Project Section. These meetings have provided an opportunity for agencies to preview technical studies and discuss project developments and review timelines. In addition, the Authority has hosted numerous focused consultation meetings with agencies on key topics, including: the César Chávez National Monument, Pacific Crest Trail (PCT), waters of the U.S., and other resources of interest within the project section.

#### Consultation Related to César Chávez National Monument

The Programmatic Agreement among the Federal Railroad Administration, Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California High-Speed Rail Authority Regarding Compliance with Section 106 of the National Historic Preservation Act as it Pertains to the California High-Speed Train Project (Section 106 PA) sets forth the procedures for involving consulting parties in the Section 106 process for the HSR program. Consulting parties, who may include other federal, state, regional, or local agencies that may have responsibilities for historic properties and may want to review reports and findings for an undertaking within their jurisdiction, have been invited to participate in undertakings covered by the Section 106 PA. Native American tribes and historical interest groups or individuals are also invited to participate as consulting parties to the Section 106 process.

Coordination with consulting parties is ongoing regarding the CCNM. Per the Section 106 PA and pursuant to 36 C.F.R. 800.10(c), the FRA and Authority have involved the César Chávez Foundation, National Park Service, National Parks Conservation Association, the Advisory Council on Historic Preservation, and the State Historic Preservation Officer in consultation regarding potential effects to the historic property. The Authority and FRA have met with the consulting parties on several occasions to discuss the development of project alternatives, anticipated adverse effects of the project on the CCNM, and ways in which the project might be modified to minimize and mitigate the effects of the project. The consulting parties have consistently expressed concerns with the potential effects of the project, which include adverse visual and noise-related effects. These effects would be minimized by the CCNM Design Option described in Section 2.2.5, but not eliminated. Noise levels however, would be further reduced by the addition of a noise barrier.

#### Pacific Crest Trail

The Authority has consulted with the U.S. Forest Service (USFS), Bureau of Land Management (BLM), and the Pacific Crest Trail Association (PCTA) to determine boundaries for the PCT; land ownership information; the proposed trail realignment for Alternatives 1, 2, 3, and 5; potential noise and visual effects, and project design for consideration of equestrian use of the trail.

Throughout 2017, the Authority, FRA, USFS, BLM, and PCTA worked collaboratively to develop a preferred realignment route for the portion of the Pacific Crest Trail that would be disturbed by the train. This trail realignment route met the objectives proposed by PCTA and USFS, and minimized noise and visual effects to trail users and equestrians. The proposed realignment route was further refined following a field visit by the Authority and PCTA in late 2017. Further consultation is currently underway, which will be presented in detail in the Draft EIR/EIS.

**Checkpoint Process**

In June of 2017, The Authority and FRA submitted a letter to the Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE), withdrawing from the MOU concerning the Integration Process for the California High-Speed Rail Program dated November, 2010, indicating the following: “We are withdrawing because based on best available information we have identified no waters under the jurisdiction of the USACE pursuant to sections 404 and 408 of the Clean Water Act.” Subsequently, on December 11, 2017, the USACE issued an Approved Jurisdictional Determination confirming that waters of the United States do not occur on the project site.

**2.3.3 Feedback on the Staff-Recommended State’s Preferred Alternative**

There was general support for the staff-recommended State’s Preferred Alternative in the various outreach events conducted by the Authority between August and September, 2018. More than 250 community members, stakeholders, and agency officials attended briefings and meetings related to the PA.

***Table 3 Outreach Related to the Staff-Recommended State’s Preferred Alternative***

Date	Meeting
August 15, 2018	Southern California Regulatory Agency Briefing
August 21, 2018	Edison Stakeholder Working Group
August 21, 2018	Tehachapi Stakeholder Working Group
August 21, 2018	Rosamond Stakeholder Working Group
August 22, 2018	Lancaster Stakeholder Working Group
August 22, 2018	Palmdale Stakeholder Working Group
September 5, 2018	Tehachapi Community Open House Meeting
September 10, 2018	Edison Community Open House Meeting
September 12, 2018	Lancaster Community Open House Meeting

Areas of concern identified during these outreach events include:

- 1) Valley Fever;
- 2) Noise and vibration;
- 3) Project costs;
- 4) Right of way acquisition;
- 5) Access to agriculture facilities;
- 6) Green energy generation facilities;
- 7) Ranchlands;
- 8) Seismic safety, drainage, flooding, and safety features; and
- 9) Operations and maintenance.

### 3. EVALUATION CRITERIA AND METHODOLOGY

This staff report evaluates Alternatives 1, 2, 3, and 5 by comparing the four alternatives across three criteria. Each of the three criteria includes multiple components, with varying degrees of context and intensity, as described below. The Authority has balanced important factors that differentiate among the alternatives.

- **Community and Environmental Factors:** The evaluation matrix compares 10 key environmental issues including socio-economic and environmental justice considerations among the alternatives:
  - Transportation
  - Noise and vibration
  - Public utilities and energy
  - Socioeconomics and communities
  - Environmental justice
  - Agricultural farmland and forest land
  - Parks, recreation and open Space
  - Aesthetics and visual resources
  - Cultural resources
  - Cumulative impacts
- **Differentiators:** Areas where the alternatives diverge from one another were identified and explored in detail to provide additional considerations for identifying a preferred alternative.
- **Performance, operations and capital costs:** Performance criteria are indicative of how the project would perform if selected for high-speed rail. Capital costs, broken down by alternative, add another useful dimension of comparison between the alternatives.

Table 4 provides information for community and environmental criteria analyzed. This report provides quantitative data and qualitative comparisons for noise and vibration, biological resources, socioeconomics and communities, and other key environmental resources. The analysis in the table uses shading to signify the alternatives with impacts that have less potential impacts when compared with other alternatives.

Community and Environmental Factors include only those environmental resource areas potentially adversely affected which differentiate among the alternatives. Resource areas that are generally affected equally by all the alternatives include:

- Air quality and climate change
- Electromagnetic fields and electromagnetic interference
- Biological resources and wetlands
- Hydrology and water resources
- Geology, soils, seismicity, and paleontological resources
- Hazardous materials and wastes
- Safety and security
- Station planning, land use, and development
- Regional growth



## 4. EVALUATION OF ALTERNATIVES

The purpose of the Bakersfield to Palmdale Project Section is to contribute to completion of the statewide HSR System by providing the public with electric-powered HSR service that offers predictable and consistent travel times between Bakersfield and Palmdale, connects the northern and southern portions of the statewide HSR system, and provides enhanced connections to airports, mass transit, and the highway network in the San Joaquin Valley and the Antelope Valley, consistent with the Passenger Rail Vision in the California State Rail Plan, including the State's travel time objectives for the HSR system.

The Authority has responded to its mandate to plan, build, and operate an HSR system that is coordinated with California's existing transportation network by adopting the following objectives and policies for the proposed HSR system:

- Provide intercity travel capacity to supplement critically overused interstate highways and commercial airports
- Meet future intercity travel demand that will be unmet by current transportation systems and increase capacity for intercity mobility
- Maximize intermodal transportation opportunities by locating stations to connect with local transit, airports, and highways
- Improve the intercity travel experience for Californians by providing comfortable, safe, frequent, and reliable high-speed travel
- Provide a sustainable reduction in travel time between major urban centers
- Increase the efficiency of the intercity transportation system
- Maximize the use of existing transportation corridors and rights-of-way to the extent feasible
- Develop a practical and economically viable transportation system that can be implemented in phases and generate revenues in excess of operations and maintenance costs
- Provide intercity travel in a manner sensitive to and protective of the region's natural and agricultural resources and reduce emissions and vehicle miles traveled<sup>2</sup> for intercity trips

Guided by the project objectives, the alternatives evaluated and recommended in the 2016 SAA incorporate refinements that, when compared to the alternatives studied in the 2010 PAA and the 2012 SAA, avoid or minimize potential impacts to existing facilities, land uses, and environmental resources.

In addition, the refinements incorporated from the 2016 SAA improve the constructability of the Bakersfield to Palmdale Project Section and optimize the HSR system's operations. The recommended Preferred Alternative, in this refinement, reflects additional engineering, collaborative engagement with communities along the Bakersfield to Palmdale Project Section, and environmental studies conducted since the 2012 SAA.

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<sup>2</sup> The total miles traveled by all vehicles in a specified area during a specified time.

## 4.1 Community and Environmental Factors Analyzed

This evaluation provides information on the environmental impacts by topical area, and where Alternatives 1, 2, 3, and 5 differ from each other or are similar. Analysis is preliminary and subject to change as the Draft EIR/EIS is still under development. Surveys were used in areas where access was permitted. To supplement for areas where access was not permitted, the Authority used predictive modelling and secondary data sources.

**Table 3 Comparison of High-Speed Rail Build Alternatives**

Impact	HSR Build Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 5
<b>Transportation</b>				
<b>Construction Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Operations Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Air Quality and Global Climate Change</b>				
<b>Construction Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Operations Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Noise and Vibration</b>				
<b>Construction Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Operations Impacts</b>				
Number of severe operational noise impacts to sensitive receivers between stations (Oswell Street in Bakersfield to O Street in Palmdale)	Residential: 1,852 Nonresidential: 5	Residential: 1,810 Nonresidential: 5	Residential: 1,850 Nonresidential: 5	Residential: 1,947 Nonresidential: 5
<b>Electromagnetic Fields and Electromagnetic Interference</b>				
<b>Construction Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Operations Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Public Utilities and Energy</b>				
<b>Construction Impacts</b>				
Number of substations affected	1	1	0	1
Number of oil wells affected	18	21	19	18
<b>Operations Impacts</b> —No differentiating effects among the HSR Build Alternatives				
<b>Biological and Aquatic Resources</b>				
Special-status plant species (acres of overall habitat)	9,387.7	9,187.8	9,568.5	9,351.7
Special-status wildlife species (acres of overall habitat affected)	23,895.8	23,252.9	23,933.4	23,744.9
Modeled federal and state threatened/endangered species habitat (acres)	16,986.3	16,987.6	17,041.5	16,893.9

Impact	HSR Build Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 5
Special-status plant communities (acres of overall habitat)	1,020.7	1,025.8	1,020.0	1,020.9
Wetlands and other waters—OHWM or edge of wetland (acres)	7.3	7.3	7.3	6.6
Waters of the state—top of bank or edge of riparian (acres)	67.6	65.1	69	63.2
<b>Hydrology and Water Resources</b>				
<b>Construction Impacts</b>				
Acres of disturbed surface area	9,825	8,753	8,865	8,733
<b>Operations Impacts</b>				
Net increase in impervious surface area (acres)	764	771	743	760
Total length of floodplains crossed (miles)	19.50	19.52	19.40	19.52
Total length of groundwater basins crossed (miles)	61	61	60.5	61
<b>Geology, Soils, Seismicity, and Paleontological Resources</b>				
<b>Construction Impacts</b>				
Approximate total miles of “high” paleontological sensitivity	8.9	8.9	8.35	8.9
Approximate total miles of “high below 5 feet” paleontological sensitivity	48.32	48.32	47.40	48.32
<b>Operations Impacts—No differentiating effects among the HSR Build Alternatives</b>				
<b>Hazardous Materials and Wastes</b>				
<b>Construction Impacts</b>				
Potential environmental concern sites and hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Cortese List)	96 PEC sites (50 high-ranked) 38 oil and gas wells 1 Cortese site	95 PEC sites (50 high-ranked) 40 oil and gas wells 1 Cortese site	96 PEC sites (50 high-ranked) 39 oil and gas wells 1 Cortese site	87 PEC sites (48 high-ranked) 38 oil and gas wells 1 Cortese site
<b>Operations Impacts—No differentiating effects among the HSR Build Alternatives</b>				
<b>Safety and Security</b>				
<b>Construction Impacts—No differentiating effects among the HSR Build Alternatives</b>				
<b>Operations Impacts</b>				

Impact	HSR Build Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 5
Number of fire, rescue, and emergency services facilities affected	None	None	None	1 (Los Angeles County Sheriff's Department Lancaster Station)
<b>Socioeconomics and Communities</b>				
<b>Construction Impacts</b>				
Disruption to community cohesion or division of existing communities from project construction	Yes	Yes (but alignment is positioned 240 feet further away from Edison Middle School as compared Alts. 1, 3, and 5)	Yes	Yes
Estimated number of displaced residential units	253	253	255	368
Estimated number of displaced businesses	316	316	316	330
Estimated number of partial agricultural parcel acquisitions	188	177	184	188
Displaced community facilities	Lancaster Community Homeless Shelter Lancaster Metrolink Station Solid Rock Bible Church Rex Parris HS	Lancaster Community Homeless Shelter Lancaster Metrolink Station Solid Rock Bible Church Rex Parris HS	Lancaster Community Homeless Shelter Lancaster Metrolink Station Solid Rock Bible Church Rex Parris HS	Los Angeles County Sheriff's Station Lancaster Metrolink Station Grace Resources Center University of Antelope Valley Iglesia de Cristo Solid Rock Bible Church Rex Parris HS
Displacement of affordable housing units at the Laurel Crest Apartments in Lancaster	No	No	No	Yes
Estimated amount of displaced de-facto affordable housing in motels in Lancaster and Palmdale	8 motels (155 rooms)	8 motels (155 rooms)	8 motels (155 rooms)	11 motels (527 rooms)
Diminished air quality at community facilities during construction	14 facilities affected	14 facilities affected	14 facilities affected	19 facilities affected
Increased traffic at community facilities during construction	13 facilities affected	13 facilities affected	13 facilities affected	19 facilities affected

Impact	HSR Build Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 5
Changes in school districts funding during construction	Loss of \$1,261,805	Loss of \$1,256,501	Loss of \$1,261,502	Loss of \$1,707,253
Temporary road closures in agricultural areas	4	0	4	4
Construction-related economic effects on agricultural revenue	Loss of \$8,619,221	Loss of \$8,619,221	Loss of \$8,619,221	Loss of \$8,052,207
Construction-related economic effects on agricultural jobs	Loss of 42 jobs	Loss of 42 jobs	Loss of 42 jobs	Loss of 42 jobs
Construction-related property tax revenue losses	Loss of \$861,496	Loss of \$850,974	Loss of \$859,557	Loss of \$877,367
Construction-related sales tax revenue losses	Loss of \$555,462	Loss of \$555,462	Loss of \$555,462	Loss of \$643,192
Construction-related sales tax revenue gains	Gain of \$15,638,958 per year during construction	Gain of \$15,942,194 per year during construction	Gain of \$16,293,094 per year during construction	Gain of \$15,318,686 per year during construction

**Operations Impacts**— No differentiating effects among the HSR Build Alternatives

#### Station Planning, Land Use, and Development

##### Construction Impacts

Number of acres of existing land uses subject to temporary conversion	1,672	1,637	1,644	1,694
Number of acres of existing land uses subject to permanent conversion	5,816	5,658	5,670	5,510
Number of general plan designated land uses subject to permanent conversion	6,111	6,056	6,164	6,098
Number of acres of general plan designated land uses subject to temporary conversion	1,795	1,784	1,768	1,820

**Operations Impacts**—No differentiating effects among the HSR Build Alternatives

#### Agricultural Farmland and Forest Land

##### Construction Impacts

Temporary use of Important Farmland	321 acres, 108 acres of which are under Williamson Act contracts	277 acres, 123 acres of which are under Williamson Act contracts	Approximately the same as Alternative 1	Same as Alternative 1
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Impact	HSR Build Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 5
Permanent conversion of Important Farmland to nonagricultural use, including Important Farmland under Williamson Act contracts or zoned for agricultural use	708 acres converted from project construction and an additional 54 acres from parcel severance: <ul style="list-style-type: none"> <li>• 141 acres are under Williamson Act contracts</li> <li>• 674 acres are zoned for agricultural use</li> </ul>	737 acres converted from project construction and an additional 43 acres converted from parcel severance: <ul style="list-style-type: none"> <li>• 145 acres are under Williamson Act contracts</li> <li>• 721 acres are zoned for agricultural use</li> </ul>	706 acres converted from project construction and an additional 54 acres converted from parcel severance: <ul style="list-style-type: none"> <li>• 141 acres are under Williamson Act contracts</li> <li>• 671 acres are zoned for agricultural use</li> </ul>	Same as Alternative 1

**Operations Impacts**—No differentiating effects among the HSR Build Alternatives

#### Parks, Recreation, and Open Space

##### Construction Impacts

Numbers of existing parks, recreation resources, trails, bike paths, or school play areas with acquisitions and/or easements.	7	7	7	8
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**Operations Impacts**—No differentiating effects among the HSR Build Alternatives

#### Aesthetics and Visual Quality

**Construction Impacts**—No differentiating effects among the HSR Build Alternatives

##### Operations Impacts

No. of key viewpoints with decreased visual quality	9	10	9	9
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#### Cultural Resources

##### Construction Impacts

Potential Effect on significant prehistoric and historic-era archaeological resources.	47	47	46	46
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##### Operations Impacts

Effect on historically significant built environment resources.	2	2	2	3
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#### Regional Growth

##### Construction Impacts

Number of short-term jobs created by project construction (including direct, indirect, and induced)	44,218	44,797	45,783	43,045
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**Operations Impacts**—No differentiating effects among the HSR Build Alternatives

HSR = high-speed rail  
 OHWM = ordinary high water mark  
 PEC = potential environmental concern  
 Data contained in this table are preliminary and for discussion purposes only. Data may be updated prior to the release of the Draft EIR/EIS.

## 4.2 Differential Factors Influencing Identification of a Preferred Alternative

The public outreach meetings and events that have taken place since 2010 have provided the Authority with comments and information to assist in identifying a Preferred Alternative.

Based on the public outreach information, along with the current impact analysis being prepared for the Draft EIR/EIS, Alternative 2 with the CCNM Design Option appears to have fewer effects to community and environmental resources and a lower cost for construction and operation of the HSR, as shown in the following table. Green shading denotes a positive outcome and red denotes a less desirable outcome.

**Table 4 Alignment Alternatives Differentiators**

Community Area	HSR Build Alternatives			
	Alternative 2*	Alternative 1	Alternative 3	Alternative 5
<b>Edison Area</b>				
Relocation of SR 58	No	Yes	Yes	Yes
Farther from key community resources (e.g., reduces effects from noise, vibration, and access)	Yes	No	No	No
<b>Mojave Area</b>				
Additional tunnel miles	No	No	Yes	No
Less of an effect to future mining areas	Yes	Yes	No	Yes
<b>Lancaster Area</b>				
Combines existing rail facilities into a smaller corridor	Yes	Yes	Yes	No
Avoids impact to Whit Carter Park (Section 4(f) impact)	Yes	Yes	Yes	No
Avoids impact to historic Denny's Restaurant #30 (Village Grille) (Section 4(f) impact)	Yes	Yes	Yes	No
Would not realign Sierra Highway in Lancaster	Yes	Yes	Yes	No

SR = State Route

\* = Staff-Recommended State's Preferred Alternative

Alternatives 1, 2, 3, and 5 vary from each other in the following areas: 1) the community of Edison, just south of Bakersfield, 2) the area near the Cal Portland mining operation, north of Rosamond, and 3) the downtown area in the City of Lancaster. The corresponding discussion below provides additional detail regarding these key areas of differentiation.

### Community of Edison:

- a. Alternative 2 would not require relocation of SR 58. This results in fewer effects to access and also reduces the construction time period, which reduces the duration of construction-related effects when compared to Alternatives 1, 3, and 5.

- b. With its location south of SR 58, Alternative 2 would be located farther away from key community resources, including Edison Middle School, low-income housing, and agricultural packing houses. This would reduce effects related to noise, vibration, and access. However, due to the fact that it would be on an elevated structure, Alternative 2 would have a greater effect on visual quality in the Edison area when compared to Alternatives 1, 3, and 5.

*\* Note Alternatives 1, 3, and 5 have the same alignment in the community of Edison*

The Mojave area, south of Tehachapi:

- a. Alternative 2 would require one mile of less tunnel and cross fewer BLM parcels. Further, the alignment for Alternatives 2 would have less of an effect on future mining areas (e.g., Cal Portland). However, Alternative 2 would likely have a greater effect on current mining operations when compared to Alternative 3.

*\* Note Alternatives 1, 2, and 5 have the same alignment in the Mojave area*

City of Lancaster:

- a. Alternative 2 would combine existing rail facilities into a narrower corridor while also providing room for any expansion needed by Union Pacific Railroad and Metrolink. This differentiation would eliminate the need to realign Sierra Highway in Lancaster. As a result, Alternative 2 would have fewer residential and commercial displacements in the downtown area. Further, Alternative would effect fewer de-facto affordable housing motels in this area when compared to Alternative 5.
- b. Alternative 2 would also avoid effects to two Section 4(f) resources in the Lancaster area: Whit Carter Park and Denny's #30 (Village Grille).

*\* Note Alternatives 1, 2, and 3 have the same alignment in the City of Lancaster*

### 4.3 Capital Costs

The following table shows the construction costs of the HSR Build Alternatives from the Bakersfield Station to the Palmdale Station in 2016 dollars. The total cost estimate includes the total effort and materials necessary to construct the this section, including stations, maintenance facilities, and modifications to roadways required to accommodate grade-separated guideways.

**Table 5 2016 Estimate of the High-Speed Rail Bakersfield to Palmdale Project Section  
Capital Costs**

Cost Category	Alternative 1	Alternative 2	Alternative 3	Alternative 5
<b>Total</b>	<b>\$13.7 billion</b>	<b>\$13.9 billion</b>	<b>\$14.1 billion</b>	<b>\$13.4 billion</b>

\*Station costs overlap with Bakersfield to Palmdale and Palmdale to Burbank Project Sections respectively

\*\* All cost categories include allocated contingencies. Category 90 is only unallocated monies

### 4.4 CCNM Design Option

Based on preliminary environmental analysis, the CCNM Design Option would minimize noise and visual effects associated with Alternatives 1, 2, 3, and 5. More detailed environmental analysis of the CCNM Design Option will be included in the Draft EIR/EIS. The CCNM Design Option would be compatible with all four HSR Build Alternatives and will be incorporated into the Preferred Alternative.



## 5. RECOMMENDATION

Preliminary analyses indicate Alternative 2 with the CCNM Design Option strikes the best balance between the project's objectives and minimizing or avoiding effects on environmental and community resources. This alternative is shown in Figure 8 (below); the CCNM Design Option is shown in Figure 7 (above).

In summary, staff believes Alternative 2 with the CCNM Design Option is preferable because it would avoid or minimize effects on:

- Section 4(f) resources;
- Schools;
- De-facto affordable housing motels;
- Disadvantaged communities;
- Agricultural facilities; and
- Mining activities.

Alternative 2 is more constructible because of the following:

- Would not require relocation of SR 58 or realignment of Sierra Highway;
- Would have fewer miles of tunnel construction; and
- Would have the fewest number of grade separations with local roadways.

The CCNM Design Option:

- Would reduce noise effects to the CCNM; and
- Would reduce visual effects to the CCNM.

Staff recommends that the Board identify Alternative 2 as the State's Preferred Alternative for the purpose of preparing the *Bakersfield to Palmdale Section EIR/EIS*. Further, staff recommends incorporation of the CCNM Design Option into the Preferred Alternative in the Bakersfield to Palmdale Draft EIR/EIS. If the Board accepts the staff recommendation, Alternative 2 with CCNM Design Option will be identified as the State's Preferred Alternative in the Draft EIR/EIS. This identification will allow the public and other stakeholders, during their review of that draft document, to focus their attention and comments on the Preferred Alternative. The Authority will release the Draft EIR/EIS for public and agency review and comment, and will take those comments into consideration while developing the final environmental document.

The Board is not approving a preferred alternative at this time. No alternative will be approved until completion of the final environmental document. Staff will return to the Board in the future to consider approving a preferred alternative for the project section.



**Figure 8 Alternative 2 with the CCNM Design Option: Staff-Recommended State’s Preferred Alternative**