

8 PREFERRED ALTERNATIVE AND STATION SITES

8.1 Introduction

This chapter identifies the California High-Speed Rail Authority's (Authority) Preferred Alternative (California Environmental Quality Act [CEQA] proposed project) for the Bakersfield to Palmdale Project Section (B-P) of the California High-Speed Rail (HSR) Project. The identification of the Preferred Alternative is based on the data presented in this Bakersfield to Palmdale Project Section Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS), including the supporting technical reports. The identification of the Preferred Alternative is also based on comments provided by local communities and stakeholders in meetings held during project scoping and ongoing public outreach conducted by the Authority since that time.

All of the B-P Build Alternatives this chapter discusses are variations of the Preferred Alignment selected by the Authority and the Federal Railroad Administration (FRA) at the conclusion of the Tier 1 EIR/EIS (Authority and FRA 2005) processes for the HSR system (Section 1.1.2, Decision to Develop a Statewide High-Speed Rail System). Building on the earlier analysis, the Authority in September 2010 issued the *Preliminary Alternatives Analysis Report, Bakersfield to Palmdale Section High-Speed Train Project EIR/EIS* (Preliminary Alternatives Analysis Report) for the Bakersfield to Palmdale Project Section. This document introduced an initial range of build alternatives based on the HSR corridor selected in 2005 and the Programmatic EIR/EIS for the statewide HSR system (three Edison, four Tehachapi, and two Antelope Valley subsection alternatives). In February 2012, the Authority released a *Supplemental Alternatives Analysis Report, Bakersfield to Palmdale Section High-Speed Train Project EIR/EIS* (2012 Supplemental Alternatives Analysis [SAA]), which presented a refined range of alternatives for the Bakersfield to Palmdale Project Section based on new information obtained since the previous study (four Edison, three Tehachapi, and four Antelope Valley subsection alternatives). Since the 2012 SAA, the Authority has continued to work to refine the alternatives in response to input from stakeholders, as well as the degree to which the alternatives meet the Authority's objectives and the Purpose and Need for the project. This additional study effort led to the preparation of an Alternatives Screening Memorandum (Authority 2016a).

The first objective of the Alternatives Screening Memorandum was to refine previous alternatives from the 2012 SAA based on new information obtained since those previous studies and compare them to the previous alternatives. The comparison was performed on a subsection basis in a process similar to that used in the previous SAAs. The second objective of the Alternatives Screening Memorandum was to combine the recommended alternatives from each subsection into complete end-to-end alignments, which resulted in eight alternatives.

Building on the Alternatives Screening Memorandum recommendations, the *Supplemental Alternatives Analysis Report, Bakersfield to Palmdale Section High-Speed Rail Project EIR/EIS* (2016 SAA) (Authority 2016b) continued the evaluation process and recommended the four alternatives analyzed in this EIR/EIS. This EIR/EIS also analyzes a design option to minimize impacts on the Nuestra Señora Reina de La Paz/César E. Chávez National Monument (La Paz), which was developed during Section 106 consultation in 2018 for La Paz.

At the October 16, 2018, Authority Board meeting, the Authority Board concurred with Authority staff that Alternative 2 with the César E. Chávez National Monument Design Option (CCNM Design Option) is the Authority's Preferred Alternative for the Bakersfield to Palmdale Project Section. Resolution #HSRA 18-18 can be found on the Authority's website (<https://hsr.ca.gov/about/board/resolutions.aspx>). At the same meeting, the Authority certified the *Fresno to Bakersfield Section Final Supplemental EIR* (Authority 2018b) and approved the F Street Station. Resolutions #HSRA 18-16 and #HSRA 18-17 can be found on the Authority's website.

Through ongoing Section 106 consultation for La Paz after the Authority Board's action on October 16, 2018, the Authority developed the Refined CCNM Design Option, which is also analyzed in this EIR/EIS. Because the Refined CCNM Design Option avoids adverse effects at La Paz, Alternative 2 with the Refined CCNM Design Option is the Authority's Preferred Alternative for the Bakersfield to Palmdale Project Section (Figure 8-1). This refinement to the Authority's Preferred Alternative is consistent with Resolution #HSRA 18-18, wherein the Authority Board directed Authority staff to "continue to consult and collaborate with the Cesar Chavez Foundation, and other consulting parties, regarding the CCNM Design Option."

8.1.1 Alignment Route

From the F Street Station, the alignment runs from Oswell Street to Morning Drive (State Route [SR] 184), with the Alternative 2 centerline located on the north side of Edison Highway on a viaduct. East of Morning Drive, the alignment transitions from the Edison Highway corridor to the SR 58 corridor, reaching the freeway corridor at Edison Road. With Alternative 2, SR 58 would remain in its current alignment, but this alternative would require an elevated structure for the HSR tracks spanning the SR 58/Edison Road interchange diagonally. This would require another elevated structure crossing back over SR 58 just past Towerline Road and three additional elevated structures to cross the HSR over existing north-south roads (i.e., Malaga Road, Comanche Drive, and Tejon Highway) spaced approximately 1 mile apart between Edison and Towerline Roads.

The Alternative 2 alignment would continue eastbound parallel to Edison Highway toward Caliente Creek. From Caliente Creek to Bealville Road, Alternative 2 would continue southeast through Keene before beginning to climb the Tehachapi Mountains at a 2.8 percent vertical grade. The alignment would include a viaduct over Caliente Creek and a combination of cuts, fills, tunnels, and viaducts before reaching and passing underneath Bealville Road. East of Bealville Road, the alignment would generally follow SR 58 north of the freeway to the SR 58 interchange with Broome Road. Between Bealville Road and Broome Road, the alignment would include three tunnels and four viaducts. The viaducts would span the Union Pacific Railroad (UPRR), Tehachapi Creek, Avenue E, and Woodford-Tehachapi Road northeast of La Paz, and SR 58 at Broome Road, crossing SR 58 three more times as the two facilities form a braided configuration within the Tehachapi Creek canyon. Under the Refined CCNM Design Option, the viaduct would be located approximately 2,800 feet from the La Paz boundary.

As SR 58 turns south approaching the City of Tehachapi, the alignment would continue on an easterly path, along the edge of the city's future development area, through a 6,500-foot tunnel. The alignment would then curve farther south and pass to the east of the city, crossing over SR 58 near Arabian Drive before crossing the Tehachapi Valley on a straight alignment through the mountains southeast of Tehachapi in a 12,700-foot tunnel that roughly follows Tehachapi Willow Springs Road. As the alignment begins the 2.8 percent descending grade into the northern Antelope Valley, it would cross Tehachapi Willow Springs Road near the Cameron Canyon Road intersection, where it would also cross the Pacific Crest Trail and the Garlock Fault.

The alignment would pass just west of the CalPortland Company limestone quarry in a 9,500-foot tunnel, then continue southeast past the east side of Willow Springs International Raceway, where it would 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 would enter the City of Lancaster at Avenue H, running parallel to the Sierra Highway/UPRR corridor through Lancaster and Palmdale. Alternative 2 would require a realignment of the UPRR corridor to the east. Therefore, Alternative 2 would align east of Sierra Highway and west of the UPRR corridor.

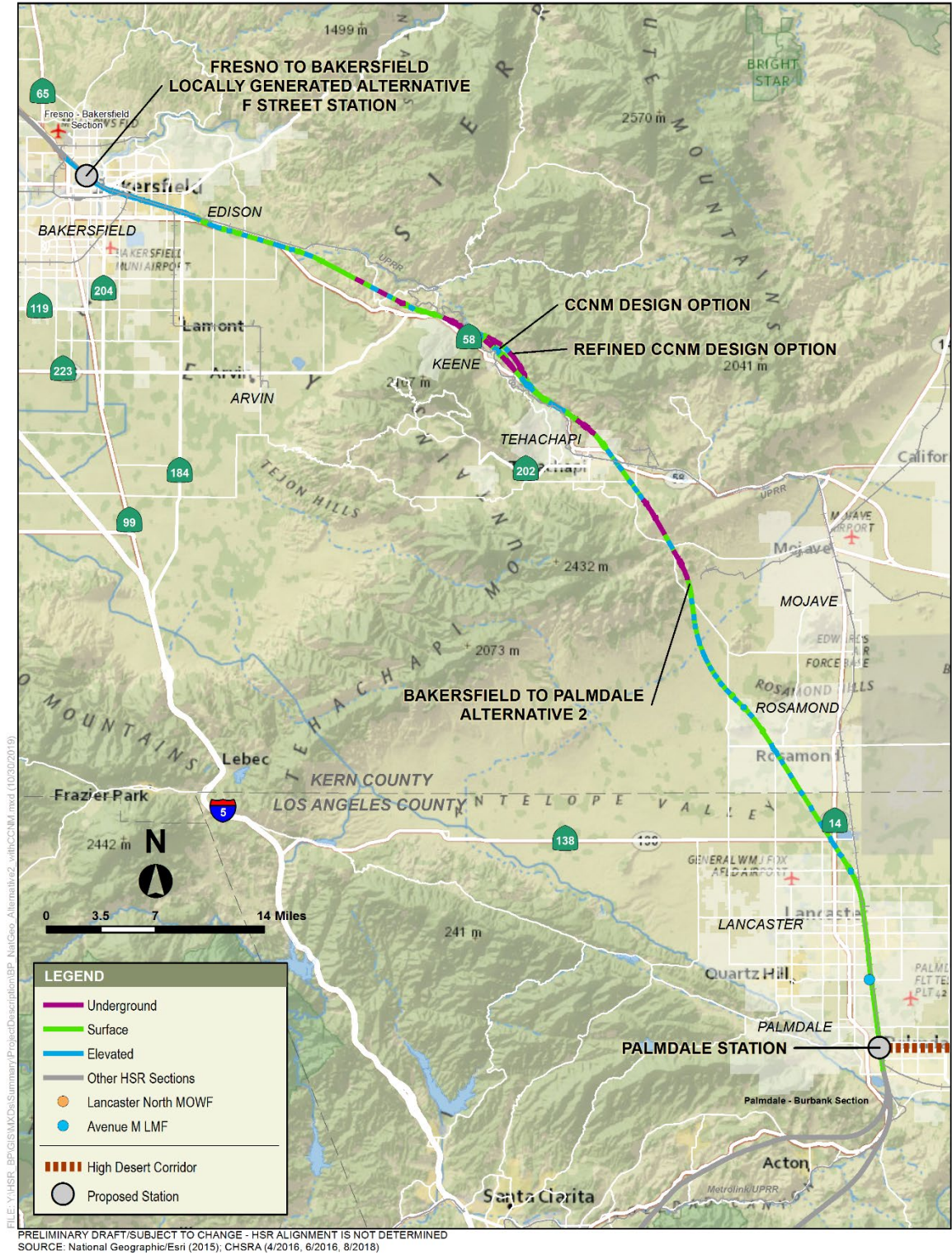


Figure 8-1 Bakersfield to Palmdale Project Section Alternative 2 Alignment with the Refined CCNM Design Option

In the Lancaster area, from Avenue H through the City of Lancaster, Alternative 2 would combine the HSR, UPRR, and Metrolink rail corridors into one combined corridor. Under Alternative 2, the new combined rail corridor matches 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. This 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 Metrolink rail corridors to the east of the HSR right-of-way.

To avoid airspace restrictions from the U.S. Air Force Plant 42 Airport to the south, the alignment would begin a transition to the west at Avenue K. The alignment would continue to Avenue M, where it 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. The westerly transition of the alignment, from Avenue K to Avenue O, would require the relocation of approximately 4.2 miles of Sierra Highway to the west. Preliminary routes for this highway relocation would vary between 500 feet and 2,900 feet west of its existing location. This would provide a separation of 500 to 2,800 feet between the rail corridor and the highway until the section terminus at the Palmdale Station, located at the Palmdale Transportation Center.

8.1.2 Maintenance Facilities

The design and spacing of maintenance facilities along the HSR alignment would require the Bakersfield to Palmdale Project Section to include two types of maintenance facilities—a light maintenance facility (LMF) and a maintenance-of-way facility (MOWF)—in the Antelope Valley. The Bakersfield to Palmdale Project Section EIR/EIS process has not included identification of a heavy maintenance facility (HMF) site. At this time, the Authority is anticipating the identification and selection of an HMF site built in the Central Valley that would service the entire statewide system. If necessary, the Avenue M LMF Zone in Lancaster could be modified within its current footprint to accommodate a reduced HMF that would only service the Bakersfield to Palmdale Project Section and potential projects to the south.

8.1.3 Project Characteristics

This Draft EIR/EIS provides information on the relative differences among physical and operational characteristics and the potential environmental consequences associated with the B-P Build Alternatives (including the CCM Design Options) and station location options, including the following:

- **Physical/Operational Characteristics:**
 - Alignment
 - Length
 - Capital cost
 - Travel time
 - Ridership
 - Constructability
- **Environmental Impacts:**
 - Transportation-related topics (air quality, noise and vibration, and energy)
 - Human environment (land use and community impacts, farmlands and agriculture, aesthetics and visual resources, socioeconomic, environmental justice populations, utilities and public services, and hazardous materials and wastes)
 - Cultural resources (archaeological resources and historical properties)
 - Natural environment (geology and seismic hazards, hydrology and water resources, and biological resources and wetlands)

- Section 4(f) properties (certain types of publicly owned parklands, recreation areas, or wildlife/waterfowl refuges, and significant historical sites regardless of ownership)

In identifying a preferred alternative, the Authority was guided by the project Purpose and Need and project objectives described in Chapter 1, Project Purpose, Need, and Objectives; the HSR Performance Criteria identified in Chapter 2, Alternatives; and the prior work developed for and recorded in the following:

- 2010 Preliminary Alternatives Analysis Report (Authority 2010)
- 2012 SAA Report (Authority 2012)
- 2016 SAA Report (Authority 2016b)
- *2018 Avoidance and Minimization Options Screening Memorandum for the César E. Chávez/ Nuestra Señora Reina de la Paz National Historic Landmark* (Authority 2018a)
- *Design Options Screening Report for the César E. Chávez/Nuestra Señora Reina de la Paz National Historic Landmark* (Authority 2019a)
- *Addendum to the Design Options Screening Report for the César E. Chávez/Nuestra Señora Reina de la Paz National Historic Landmark* (Authority 2019b)

These documents are available for review upon request. Please contact records@hsr.ca.gov.

8.2 Summary of Scoping Comments

Since the 2010 Preliminary Alternatives Analysis document was prepared, public engagement for key environmental stakeholders has occurred, with outreach meetings and events held in communities along the proposed HSR alignments. The Authority held and participated in public meetings hosted by the Authority and other agencies to provide project information and obtain feedback. The various meeting formats included open houses, formal presentations, and question and comment sessions, and were used to present information and provide opportunities for input by participants.

Public information meetings were held to inform the public about the alternatives analysis recommendations for the Bakersfield to Palmdale Project Section and the status of the EIR/EIS preparation. In addition, these meetings offered information on various HSR project components and gave opportunities for obtaining feedback. The public information meetings included brief presentations and project information materials, and project staff members were available to answer questions. Meetings were announced through direct mail to those in the project database, through advertisements in local newspapers, and through postings on the Authority's website (www.hsr.ca.gov/). Various publications and materials were also made available on the Authority's website.

Additional outreach took place in November 2016, which included staffing a manned booth at the Kern Energy Summit in Bakersfield; participation at the 5th Annual Greater Antelope Valley STEMposium in the Antelope Valley; and continued Stakeholder Working Group meetings, community open house meetings, quarterly one-on-one briefings with county and local elected officials, e-blast updates, and stakeholder briefings. Community meetings were also held in late January 2017, early February 2017, and August 2018 in the communities of Edison, Tehachapi, Rosamond, Lancaster, and Palmdale. Chapter 9, Public and Agency Involvement, in this EIR/EIS, lists the public meeting dates and topics that were covered.

8.2.1 Areas of Concern Raised in Scoping Comments

The following is a summary of areas of concern that were discussed during the Bakersfield to Palmdale Project Section outreach. The summary is organized by community and includes discussions and comments from community meetings, stakeholder workshops, and open houses.

8.2.1.1 Community of Edison

Comments and issues raised by community of Edison stakeholders and residents include the following:

- Mobility, economic development, and access to good jobs and educational opportunities ranked high at previous Stakeholder Working Group meetings.
- Improving air quality and providing more jobs and contracting opportunities to residents and businesses in environmental justice communities were also deemed critical to Stakeholder Working Group participants.
- Agricultural interests in the area want to maintain access to and from their farms/businesses and local roadways during and after project construction, and ensure the Authority is knowledgeable about their different harvest and delivery periods throughout the year.
- Minimizing impacts on local wind and solar farms was deemed crucial to the region's economy.

Issues raised by open house attendees include:

- Concerns about the right-of-way process (including compensation), impacts on wildlife and local streams, and privacy.
- Concerns regarding potential impacts on local properties.

8.2.1.2 City of Tehachapi

Comments and issues raised by the City of Tehachapi stakeholders and residents include the following:

- Improving pedestrian and bicycle access is critical to the city's future development plans.
- Stakeholder Working Group participants deemed promoting economic development, increasing opportunities for jobs and quality education, and creating and improving public open spaces and parks as critical.
- Stakeholder Working Group participants raised concerns about potential noise and visual impacts, as well as the project's location in relation to the Garlock Fault and other potential fault lines.
- Stakeholders raised concerns regarding the noise, vibration, and visual impacts on La Paz.

Issues raised by open house attendees include:

- Complaints about the alternatives selection process.
- Concerns about taking Willow Springs Road and dividing the city, blocking views, and impacts from noise, vibration, dust, and security/derailment.
- Multiple suggestions that the route should go through the Grapevine and/or follow SR 99 to the Interstate 5 corridor, then to SR 138 and to Palmdale.
- Concerns regarding impacts on area water wells from tunneling through the mountains, the California condor and its habitat, recreation and walkability, increased potential for wildfires, and impacts on local properties.

8.2.1.3 Community of Rosamond

Comments and issues raised by community of Rosamond stakeholders and residents include the following:

- Stakeholder Working Group participants deemed improving pedestrian and bicycle access as very important and suggested creating bicycle and pedestrian lanes, as well as paving some of the area's dirt roads.
- Drainage and flooding issues are prevalent across the area, especially at Caliente Creek.

- Stakeholder Working Group participants raised concerns regarding potential impacts on groundwater and wells, maintaining access to these wells, and ownership of water rights in the area once the HSR project is completed.
- Dust control management and Valley fever are key issues that need to be addressed in relation to construction of the project.
- Stakeholder Working Group participants mentioned that arsenic levels are high in the Rosamond area, and the area currently has no stormwater plan in place.
- Stakeholder Working Group participants mentioned promoting economic development, requiring local hiring for this project, and improving the local economy by siting the Authority's HMF in Kern County.
- Stakeholder Working Group participants raised concerns that the project not block local streets and that traffic circulation be maintained in the area.

Issues raised by open house attendees include:

- Concerns about the right-of-way process and compensation, impacts on wildlife and livestock transitions, equestrian access, loss of views, flood zones, use of water, impacts on quality of life, noise pollution, aesthetics, seismic safety, Joshua trees, and impacts on local businesses.
- Concerns regarding sound walls, an overpass at 60th Street and Rosamond Boulevard, the closing of two water wells, electricity being taken from the Rosamond grid, Valley fever from dust, and the project's proximity to a local school and the Exotic Feline Breeding Compound.
- Concerns regarding the alternatives selection process; a possible decrease in property values; loss of key access roads and train crossings; noise, wind, and visual impacts; crosswinds and gusts; and off-road users' access to mountain areas.
- Concerns regarding the potential impacts of train noise on animals at the Exotic Feline Breeding Compound.

8.2.1.4 City of Lancaster

Comments and issues raised by Lancaster stakeholders and residents include the following:

- Stakeholder Working Group participants deemed improving connectivity and accessibility, improving pedestrian and bicycle access, and enhancing mobility choices as important.
- Stakeholder Working Group participants highly ranked economic development, job creation, and quality education.
- For Stakeholder Working Group participants representing local school districts in the area, rail safety was their top priority, including the use of fencing around HSR tracks.
- Traffic fatalities are an ongoing issue for the City of Lancaster, with representatives stating that accessibility and mobility are of key importance.
- The City of Palmdale is moving toward Complete Streets.
- Emergency vehicle access to rural areas needs to be maintained during and after construction.
- Noise, light, air quality, and dust issues are very important to rural communities in the area.

Issues raised by open house attendees include the following:

- Concerns about impacts on the bottomless lake, creating a dead end on Sierra Highway, historical buildings in the area, seismic safety, aesthetics, train speed, noise, and vibration, and impacts on downtown Lancaster.
- Several attendees preferred the 2012 SAA alignment through Rosamond, as well as having the alignment go through solar/wind farms to protect residential properties.

- Making improvements to SR 138.
- Concerns about the potential impacts of train noise on senior centers and senior housing, protection of wild horses near Oak Creek, wildlife migrations, local access roads for residents, equestrian access, and the location of substations, radio towers, and new power lines.
- Concerns were also raised about potential motel property acquisitions along Sierra Highway.

The Authority has refined the design of the B-P Build Alternatives in response to input from community stakeholders, businesses, local agencies, and elected officials. As described in Section 8.3.1.2, Differential Factors Influencing Identification of a Preferred Alternative, the community engagement process provided valuable input to help identify the Preferred Alternative.

8.3 Alternatives Considered

After the *Final Program EIR/EIS for the Proposed California High-Speed Train System* (Authority and FRA 2005), the Authority, in cooperation with FRA, began the environmental review process for the Bakersfield to Palmdale Project Section of the California HSR Project. The review process began with the publishing of a National Environmental Policy Act (NEPA) Notice of Intent and CEQA Notice of Preparation, followed by a public scoping process in early 2009. The environmental review process resulted in a number of alternatives analysis reports being developed in consultation with public, federal, state, and local agencies, and community groups.

In 2010, the Authority and FRA prepared the Preliminary Alternatives Analysis Report that outlined the initial range of alternatives between Bakersfield and Palmdale. The 2012 SAA Report refined this range of alternatives, and the 2016 Alternatives Analysis included a 2015 Alternatives Screening Memorandum that consolidated subsection options into eight alternatives.

Additional evaluation of these alternatives in the 2016 SAA Report recommended moving forward four alternatives (Alternatives 1, 2, 3, and 5) for evaluation in the Draft EIR/EIS for the Bakersfield to Palmdale Project Section. In 2018, as a result of the Section 106 consultation process for adverse effects on La Paz, a design option for these alternatives was developed to avoid and minimize impacts on La Paz. In 2019, as a result of the ongoing Section 106 consultation process for adverse effects on La Paz, a second design option was developed to fully avoid adverse effects on La Paz.

Please refer to the SAA Report (Authority 2016b) for a discussion of alternatives that were considered but eliminated from further consideration in this EIR/EIS document. For more information on the alternatives analysis process, see Chapter 2, Alternatives, Section 2.3.12, Range of Potential Alternatives Considered and Findings.

8.3.1 Preferred Alternative

This section describes how the Authority identified the Preferred Alternative the agency believes would fulfill its statutory mission and responsibilities by giving consideration to economic, environmental, technical, and other factors. The Authority identified the Preferred Alternative by balancing the adverse and beneficial impacts of the project on the human and natural environment. There was no single determining factor in identifying the Preferred Alternative because of the multitude of issues considered and the varied input received from stakeholders on each of the four B-P Build Alternatives. Furthermore, many impacts on the natural environment and community resources would be the same, or very similar, across all four B-P Build Alternatives and, therefore, do not always provide enough meaningful information to distinguish between the relative merits of the alternatives. Due to the similarity of the four B-P Build Alternatives, in order to identify a Preferred Alternative, various differentiators were determined based on stakeholder, agency, and community input.

The Authority weighed all of the issues, including natural resource and community impacts, the input of the communities along the route, the views of federal and state resource agencies, project costs, constructability, and differentiators to identify what both agencies believe is the best alternative to achieve the project's Purpose and Need. Table 8-A-1 in Appendix 8-A and Section 8.3.1.2 provide a comparison of the various criteria evaluated in this Draft EIR/EIS for Alternatives

1, 2, 3, and 5. Similarly, Section 8.3.1.3 provides a comparison of the various criteria evaluated in this Draft EIR/EIS for the CCNM Design Options in comparison to the common alignment shared by Alternatives 1, 2, 3, and 5 in the vicinity of La Paz.

The identification of the Preferred Alternative also integrates the Authority's evaluation under Section 4(f) pursuant to 23 U.S Code 327 and the terms of the NEPA Assignment Memorandum of Agreement (FRA and State of California 2019) assigning to the Authority responsibility for compliance with NEPA and other federal environmental laws, including Section 4(f) (49 U.S. Code 303) and related U.S. Department of Transportation orders and guidance. As described in Chapter 4, Section 4(f)/6(f) Evaluation, Section 4(f) properties can only be used by federally funded transportation projects if there is no feasible and prudent alternative and all possible planning has been taken to minimize harm to any 4(f) property used by the project, or if a finding of *de minimis* impact¹ is made. For more information on Authority's evaluation under Section 4(f), please see Chapter 4.

8.3.1.1 Environmental Factors Influencing Selection of a Preferred Alternative

This evaluation provides information on the environmental impacts by topical area and notes where Alternatives 1, 2, 3, and 5 differ from each other or are similar (Table 8-A-1 [Appendix 8-A] and Table 8-1). Impacts in this table include the build alternatives south of Oswell Street; impacts for the portion of the Fresno to Bakersfield Locally Generated Alternative (F-B LGA) from the intersection of 34th Street and L Street to Oswell Street are included in a separate column since there is a common alignment among all B-P Build Alternatives north of Oswell Street. The impacts below do not reflect the CCNM Design Options, which could be added to any of the four alternatives. Addition of the CCNM Design Options would result in the same impact changes across all alternatives, and therefore would not contribute to this evaluation.

¹ A *de minimis* impact under Section 4(f) is a determination finding of no adverse effect on protected activities, features, or attributes to the resource(s).

Table 8-1 Comparison of Bakersfield to Palmdale Project Section Build Alternatives

Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 5	F-B LGA 34th Street/L Street Intersection to Oswell Street
Transportation					
Construction Impacts —No differentiating impacts among the B-P Build Alternatives					Roadway Segment Closures: 2 Affected Intersections: 3
Operations Impacts —No differentiating impacts among the B-P Build Alternatives					
Air Quality and Global Climate Change					
Construction Impacts —No differentiating impacts among the B-P Build Alternatives					
Operations Impacts —No differentiating impacts among the B-P Build Alternatives					
Noise and Vibration					
Construction Impacts —No differentiating impacts among the B-P Build Alternatives					
Operations Impacts					
Number of severe operational noise impacts on sensitive receivers between stations (Oswell Street in Bakersfield to O Street in Palmdale)	Residential: 1,845 Nonresidential: 12	*Residential: 1,803 Nonresidential: 12	Residential: 1,843 Nonresidential: 12	Residential: 1,943 Nonresidential: 12	Residential: 2,726 Nonresidential: 32
Electromagnetic Fields and Electromagnetic Interference					
Construction Impacts —No differentiating impacts among the B-P Build Alternatives					
Operations Impacts —No differentiating impacts among the B-P Build Alternatives					
Public Utilities and Energy					
Construction Impacts					
Number of substations affected	1	1	*0	1	0
Number of oil wells affected	7	*6	7	7	0
Operations Impacts —No differentiating impacts among the B-P Build Alternatives					
Biological and Aquatic Resources					
Special-status plant species (acres of overall habitat)	10,175.6	*9,974.4	10,391.5	10,138.4	22.24
Special-status wildlife species (acres of overall habitat affected)	59,297.7	*58,671.0	59,567.9	58,685.3	100.79
Modeled federal and state threatened/endangered species habitat (acres)	27,507.8	26,986.4	27,651.5	*27,335.5	107.00
Special-status plant communities (acres of overall habitat)	1,161.50	1,166.60	*1,160.70	1,161.60	0

Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 5	F-B LGA 34th Street/L Street Intersection to Oswell Street
Wetlands and other waters—OHWM or edge of wetland (acres)	56.9	54.7	56.6	*53.3	0.37
Waters of the state—top of bank or edge of riparian (acres)	87.6	85.3	89	*84.0	0

Hydrology and Water Resources

Construction Impacts

Acres of disturbed surface area	9,825	8,757	8,864	*8,733	78
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Operations Impacts

Net increase in impervious surface area (acres)	764	770	*743	760	30
Total length of floodplains crossed (miles)	19.5	19.5	*19.4	19.5	0
Total length of groundwater basins crossed (miles)	61	61	*60.5	61	4.01

Geology, Soils, Seismicity, and Paleontological Resources

Construction Impacts

Approximate total miles of “high” paleontological sensitivity	8.9	8.88	*8.35	8.9	0
Approximate total miles of “high below 5 feet” paleontological sensitivity	48.32	48.33	*47.40	48.32	4.01

Operations Impacts—No differentiating impacts among the B-P Build Alternatives

Hazardous Materials and Wastes

Construction Impacts

Potential environmental concern sites and hazardous materials sites	73 PEC sites (50 high-ranked) 38 oil and gas wells	73 PEC sites (50 high-ranked) 40 oil and gas wells	73 PEC sites (50 high-ranked) 39 oil and gas wells	*71 PEC sites (48 high-ranked) 38 oil and gas wells	89 PEC sites (6 high-ranked) 11 oil and gas wells
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Operations Impacts—No differentiating impacts among the B-P Build Alternatives

Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 5	F-B LGA 34th Street/L Street Intersection to Oswell Street
Safety and Security					
Construction Impacts —No differentiating impacts among the B-P Build Alternatives					
Operations Impacts					
Number of fire, rescue, and emergency services facilities affected	*None	*None	*None	1 (Los Angeles County Sheriff's Department Lancaster Station)	*None
Need for expansion of existing fire, rescue, and emergency service facilities	*None	*None	*None	Yes	*None
Socioeconomics and Communities					
Construction Impacts					
Disruption to community cohesion or division of existing communities from project construction	Yes	*Yes (but alignment is positioned 240 feet farther southwest of Edison Middle School)	Yes	Yes	Yes
Estimated number of displaced residential units	*253	*253	255	368	36
Estimated number of displaced businesses	*311	*311	*311	329	192
Estimated number of partial agricultural parcel acquisitions	188	175	188	188	0
Displaced community facilities	*Lancaster Community Homeless Shelter Lancaster Metrolink Station Solid Rock Bible Church	*Lancaster Community Homeless Shelter Lancaster Metrolink Station Solid Rock Bible Church	*Lancaster Community Homeless Shelter Lancaster Metrolink Station Solid Rock Bible Church	Los Angeles County Sheriff's Station Lancaster Metrolink Station Grace Resources Center University of Antelope Valley Iglesia de Cristo Solid Rock Bible Church	Golden Empire Gleaners, Iglesia do Dios Pentecostes La Hermosa, Mercado Latino, Bakersfield Homeless Center, Kern County Veteran Affairs, Kern County Parks and Recreation, and a City-owned storage facility
Displacement of affordable housing units at the Laurel Crest Apartments in Lancaster	*No	*No	*No	Yes	Not Applicable

Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 5	F-B LGA 34th Street/L Street Intersection to Oswell Street
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)	Not Applicable
Diminished air quality at community facilities during construction	*14 facilities affected	*14 facilities affected	*14 facilities affected	19 facilities affected	7 facilities affected
Increased traffic at community facilities during construction	*13 facilities affected	*13 facilities affected	*13 facilities affected	19 facilities affected	7 facilities affected
Changes in school districts funding during construction	*Loss of \$1.3 million	*Loss of \$1.3 million	*Loss of \$1.3 million	Loss of \$1.7 million	*Loss of \$0.2 million ¹
Temporary road closures in agricultural areas	4	*0	4	4	0
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	None
Construction-related economic effects on agricultural jobs	Loss of 42 jobs	Loss of 42 jobs	Loss of 42 jobs	Loss of 42 jobs	None
Construction-related property tax revenue losses	*Loss of \$754,134	Loss of \$760,126	Loss of \$759,483	Loss of \$853,787	Loss of \$477,949
Construction-related sales tax revenue losses	*Loss of \$532,375	*Loss of \$532,375	*Loss of \$532,375	Loss of \$638,575	Loss of \$57,145
Construction-related sales tax revenue gains	Gain of \$24.4 million per year during construction	Gain of \$24.4 million per year during construction	Gain of \$24.4 million per year during construction	Gain of \$24.4 million per year during construction	Gain of \$85,000 per year during construction

Operations Impacts—No differentiating impacts among the B-P 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	54
Number of acres of existing land uses subject to permanent conversion	5,816	5,658	5,670	*5,510	53
Number of general plan designated land uses subject to permanent conversion	6,111	*6,056	6,164	6,098	53
Number of acres of general plan designated land uses subject to temporary conversion	1,795	1,784	*1,768	1,820	54

Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 5	F-B LGA 34th Street/L Street Intersection to Oswell Street
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Operations Impacts—No differentiating impacts among the B-P Build Alternatives

Agricultural Farmland and Forest Land

Construction Impacts

Temporary use of Important Farmland	322 acres, 29 acres of which are under Williamson Act contracts	*276 acres, 30 acres of which are under Williamson Act contracts	Approximately the same as Alternative 1	Same as Alternative 1	0 acre
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"> 93 acres are under Williamson Act contracts 674 acres are zoned for agricultural use 	738 acres converted from project construction and an additional 40 acres converted from parcel severance: <ul style="list-style-type: none"> 106 acres are under Williamson Act contracts 721 acres are zoned for agricultural use 	*705 acres converted from project construction and an additional 54 acres converted from parcel severance: <ul style="list-style-type: none"> 93 acres are under Williamson Act contracts 671 acres are zoned for agricultural use 	Same as Alternative 1	0 acre

Operations Impacts—No differentiating impacts among the B-P Build Alternatives

Parks, Recreation, and Open Space

Construction Impacts

Number of existing parks, recreation resources, trails, bike paths, or school play areas with acquisitions and/or easements	*7	*7	*7	8	1 (0.099 acre of Weill Park)
Number of linear feet included in the Pacific Crest Trail realignment	845	845	*0	845	Not Applicable

Operations Impacts—No differentiating impacts among the B-P Build Alternatives

Aesthetics and Visual Quality

Construction Impacts—No differentiating impacts among the B-P Build Alternatives

Operations Impacts

Number of key viewpoints with decreased visual quality	*9	10	*9	*9	2
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Impact	Alternative 1	Alternative 2	Alternative 3	Alternative 5	F-B LGA 34th Street/L Street Intersection to Oswell Street
Cultural Resources					
Construction Impacts					
Potential effect on significant prehistoric and historic-era archaeological resources	47	47	*46	*46	0
Operations Impacts					
Effect on historically significant built environment resources	*2	*2	*2	3	9
Regional Growth					
Construction Impacts					
Number of short-term jobs created by project construction (annual job years, including direct, indirect, and induced)	154,900	154,600	162,000	*154,300	1,323
Operations Impacts—No differentiating impacts among the B-P Build Alternatives					

* = least impactful alternative(s)

¹ This is a worst-case estimate. Per the F-B LGA Community Impact Assessment (Authority 2017), there is a suitable amount of vacant replacement housing available in the zip codes corresponding with all anticipated displacements in the study area. Families in the City of Bakersfield and portions of unincorporated Kern County, therefore, would be able to relocate in close proximity to their existing homes, and students would likely have the opportunity to remain in their current school districts. The school districts that serve these communities, therefore, would not experience a large reduction in financing as a result of reduced student populations. Additionally, the total number of students affected represents a small percentage of the total student body at each of the affected school districts in these jurisdictions. Any effect on school district funding, therefore, would be small.

B-P = Bakersfield to Palmdale Project Section
 F-B LGA = Fresno to Bakersfield Locally Generated Alternative
 OHWM = ordinary high water mark
 PEC = potential environmental concern

8.3.1.2 Development of the CCNM Design Options

While previously proposed alignments had been moved to avoid permanent direct impacts on La Paz, representatives of La Paz expressed concerns regarding noise, vibration, and visual impacts on the property during a meeting held in March 2013 and in subsequent meetings and correspondence during the Section 106 consultation process, including most recently July 2019. In response to this concern, the Authority first developed the CCNM Design Option, which would shift the alignment to approximately 850 feet northeast of the historic property boundary, and later developed the Refined CCNM Design option, which would shift the alignment approximately 2,800 feet northeast of the historic property boundary.

A total of five realignment options were considered to reduce noise, vibration, and visual impacts. The optimal avoidance option balances impacts on resources, constructability, and project costs while also minimizing indirect impacts on La Paz. The option chosen (the Refined CCNM Design Option) avoids the adverse visual and noise impacts on La Paz compared to the previously developed alignment and also requires the fewest relocations, crosses the fewest parcels, and reduces costs, compared to the other options considered, by requiring fewer tunnel miles. Based on these factors, the Refined CCNM Design Option is included in the Preferred Alternative.

8.3.1.3 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 Refined Design Option appears to have fewer impacts on community and environmental resources and a lower cost for construction and operation of the HSR, as shown in Table 8-2.

Table 8-2 Bakersfield to Palmdale Alignment Alternatives Differentiators

Community Area	Preferred Alternative 2	Alternative 1	Alternative 3	Alternative 5	CCNM Design Option	Refined CCNM Design Option
Entire Alignment						
Grade separations	52	59	58	59	N/A	NA
Edison Area						
Relocation of State Route 58	No	Yes	Yes	Yes	N/A	N/A
Farther from key community resources (e.g., reduces impacts from noise, vibration, and access)	610 feet from Edison Middle School	450 feet from Edison Middle School	450 feet from Edison Middle School	450 feet from Edison Middle School	N/A	N/A
Additional visual impacts on Edison Middle School	Yes	No	No	No	N/A	N/A
Keene Area						
Reduces noise and visual impacts to La Paz	No	No	No	No	Yes	Yes
Minimizes noise and visual impacts to La Paz	No	No	No	No	No	Yes
Mojave Area						
Additional tunnel miles	0 mile	0 mile	1 mile	0 mile	N/A	N/A
Avoidance of future mining areas	Yes	Yes	No	Yes	N/A	N/A
Lancaster Area						
Combines existing rail corridor (fewer residential and affordable housing displacements) ¹	155 rooms, 96 residential units	155 rooms, 96 residential units	155 rooms, 96 residential units	372 rooms, 132 residential units	N/A	N/A
Results in no impacts on Whit Carter Park	Yes	Yes	Yes	No	N/A	N/A
Avoids impacts on historic property (Village Grille)	Yes	Yes	Yes	No	N/A	N/A

¹ "Rooms" describes the number of rooms affected in motels that service as de-facto affordable housing, and "units" describes the number of affordable housing units affected.

N/A = not applicable

SR = State Route

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 CalPortland Company mining operation, north of Rosamond; and (3) downtown Lancaster. The corresponding discussion below provides additional detail regarding these key areas of differentiation.

- **Community of Edison:**²
 - Alternative 2 would not require relocation of SR 58. This results in fewer impacts on access and also reduces the construction time period, which in turn, reduces the duration of construction-related impacts when compared to Alternatives 1, 3, and 5.
 - With its location south of SR 58, Alternative 2 would be farther from key community resources, including Edison Middle School, low-income housing, and agricultural packing houses. This would reduce impacts related to noise, vibration, and access. However, because the Alternative 2 alignment would be located on an elevated structure, it would have a greater impact on visual quality (but would not rise to a level of significance) in the Edison area compared to Alternatives 1, 3, and 5.
- **The Mojave Area, South of Tehachapi:**³
 - Alternative 2 would require 1 mile less of tunnel and would cross fewer Bureau of Land Management parcels. Furthermore, the alignment for Alternative 2 would avoid future mining areas (e.g., the CalPortland Company).
- **City of Lancaster:**⁴
 - Alternative 2 would combine existing rail facilities into a narrower corridor while also providing room for any expansion needed by UPRR or 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 downtown Lancaster. Furthermore, Alternative 2 would impact fewer motels serving as de-facto affordable housing in this area when compared to Alternative 5.
 - Alternative 2 would also avoid impacts on two Section 4(f) resources in the Lancaster area—Whit Carter Park and Denny’s #30 (Village Grille).

Based on the evaluation of the key differentiators provided above, Alternative 2 is recommended as the Preferred Alternative.

In summary, when compared to Alternatives 1, 3, and/or 5, Alternative 2 would result in fewer impacts on the following:

- Section 4(f) properties
- Downtown areas
- Schools
- Disadvantaged communities
- Mining activities

Alternative 2 is more constructible because of the following:

- It does not require relocation of SR 58
- It has fewer miles of tunnel construction
- It has the fewest number of grade separations with local roadways

8.3.1.4 Station Sites

The Preferred Alternative for the Bakersfield to Palmdale Project Section would be served by stations in the City of Bakersfield and the City of Palmdale, as described below.

Bakersfield Station

Following the approval in 2014 of the Record of Decision for the *Fresno to Bakersfield Section Final EIR/EIS* (Authority 2014), the Authority and the City of Bakersfield agreed to consider an

² Alternatives 1, 3, and 5 have the same alignment in the community of Edison.

³ Alternatives 1, 2, and 5 have the same alignment in the Mojave area.

⁴ Alternatives 1, 2, and 3 have the same alignment in the City of Lancaster.

alternate station location at F Street and SR 204. This station alternative is included in the Fresno to Bakersfield Project Section documents, including the Fresno to Bakersfield Section Draft Supplemental EIR/EIS (Authority and FRA 2017) and Final Supplemental EIR (Authority 2018b) and Final Supplemental EIS (Authority 2019).

The *Fresno to Bakersfield Section Draft Supplemental EIR/EIS* for the LGA was circulated for public review in November 2017. In October 2018, the Authority Board certified the Final Supplemental EIR and approved the Locally Generated Alternative through the 34th Street and L Street intersection, including the F Street Station. In taking this action, the Authority Board reserved making a decision on the alignment from south of the F Street Station to Oswell Street to a future action on the Bakersfield to Palmdale Project Section. As such, the approval of this portion of the alignment may occur through approval of the Bakersfield to Palmdale Project Section.

The Fresno to Bakersfield Project Section environmental documents provide analysis for the section terminating at Oswell Street in Bakersfield. This Bakersfield to Palmdale Project Section environmental document provides analysis from Oswell Street to the Palmdale Station. Accordingly, mitigation measures for impacts related to the alignment southeast of the F Street Station and identified in the Fresno to Bakersfield Section Final Supplemental EIR would be included as part of the approval of the Bakersfield to Palmdale Project Section. For this portion of the F Street Station to Oswell Street, all B-P Build Alternatives share a common alignment. Mitigation measures for this section, including Mitigation Measures S&S-MM#4 and SO-MM#3, which contain mitigation specific to this portion of the LGA, are incorporated by reference in this document from the Fresno to Bakersfield Section Final Supplemental EIR.

Additionally, the selection of the F Street Station in Bakersfield (in the Fresno to Bakersfield Section Final Supplemental EIR and Final Supplemental EIS) has no influence on the alternatives being considered for the Bakersfield to Palmdale Project Section from Oswell Street to the Palmdale Station.

Palmdale Station

The Palmdale Station would be located in downtown Palmdale along the existing railroad corridor. The existing Palmdale Transportation Center would be relocated to the south to accommodate HSR service, and the station platforms would be bound by E Avenue Q to the north and Palmdale Boulevard to the south. Chapter 2 of this EIR/EIS provides figures showing the location of the Palmdale Transportation Center. The Palmdale Transportation Center is the only station location being proposed for all B-P Build Alternatives; therefore, the Palmdale Station location at the Palmdale Transportation Center is the preferred station alternative for Palmdale.

8.3.1.5 Maintenance Facility

The California HSR System includes four types of maintenance facilities: MOWFs, maintenance of infrastructure siding (MOIS) facilities, HMFs, and LMFs. The California HSR System would require only one HMF for the system. The design and spacing of maintenance facilities along the HSR alignment would require the Bakersfield to Palmdale Project Section to include three maintenance facilities (one MOWF and two MOIS) plus an option for an LMF facility in the Antelope Valley. (If the Bakersfield to Palmdale Project Section were to be built and operated independently, then the LMF in the Antelope Valley would be required.) Potential sites for the LMF and MOWF, as well as a co-located LMF/MOWF, are situated in the Antelope Valley. The two MOIS facilities would be located in Edison and Tehachapi. The locations of the LMF and the MOWF would generally be the same for all of the B-P Build Alternatives; therefore, the two facility sites in the Antelope Valley are the preferred LMF and MOWF sites for the Bakersfield to Palmdale Project Section. If no HMF is available in the Central Valley, the LMF could also perform as a limited HMF, following additional environmental review, as discussed in Chapter 2 of this EIR/EIS.

8.3.2 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)(2) states that if the environmentally superior alternative is the No Project Alternative, then the EIR must also identify an environmentally superior alternative among the other alternatives. For the reasons described in this EIR/EIS, the environmentally superior alternative is not the No Project Alternative. The B-P Build Alternatives would provide benefits, including reducing vehicle trips on freeways and reducing regional air pollutants, which would not be realized under the No Project Alternative. The Preferred Alternative for the Bakersfield to Palmdale Project Section is the environmentally superior alternative under CEQA. Implementing the HSR project between Bakersfield and Palmdale would have adverse environmental impacts regardless of which alternative is selected; overall, however, the Preferred Alternative provides the environmentally superior alternative by best meeting environmental regulatory requirements and best minimizing impacts on the natural environment, farmland, and communities.

8.3.3 Environmentally Preferable Alternative

The environmentally preferable alternative is a NEPA term for the alternative that will promote the national environmental policy as expressed in NEPA Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historical, cultural, and natural resources. As required by the regulations implementing NEPA, the Authority will identify the environmentally preferable alternative in its Record of Decision for the Bakersfield to Palmdale Project Section.

8.3.4 Least Environmentally Damaging Practicable Alternative

The Authority has worked closely with federal, state, and regional agencies to meet regulatory requirements and refine the B-P Build Alternatives to avoid and minimize impacts for this project section.

For previous HSR project sections, the Authority and FRA have entered into a NEPA/Section 404/Section 408 Integration Process memorandum of understanding with the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (FRA et al. 2010). In doing so, they created a checkpoint process that consists of three submittals of technical data and studies by the Authority and FRA to U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency in determining the preliminary Least Environmentally Damaging Practicable Alternative and providing a formal agency response.

For the Bakersfield to Palmdale Project Section, the checkpoint process is not applicable because there are no jurisdictional waters of the U.S. within the project section (see letter from U.S. Army Corps of Engineers dated December 11, 2017, in Appendix 8-B); therefore, there is no U.S. Army Corps of Engineers Clean Water Act jurisdiction. The FRA letter dated June 29, 2017, in Appendix 8-B, documents that FRA's withdrawal from the checkpoint process, due to the absence of jurisdictional waters of the U.S., is consistent with the procedures in the NEPA/Section 404/Section 408 Integration Process memorandum of understanding.

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