

8 PREFERRED ALTERNATIVE AND STATION SITES

Since publication of the Palmdale to Burbank Project Section Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS), the following substantive changes have been made to this section:

- Figure 8-1, Palmdale to Burbank Project Section Preferred Alternative, and Station and Figure 8-2 Palmdale to Burbank Project Section Build Alternatives and Station, were revised to reflect approval of the Burbank Airport Station.
- Table 8-2, Comparison of High-Speed Rail Build Alternatives, was updated under Biological and Aquatic Resources regarding Construction and Operations Impacts to include information as to nonurban portions of each Build Alternative alignment that would restrict wildlife movement.
- Table 8-2, Comparison of High-Speed Rail Build Alternatives, was updated under Air Quality and Global Climate Change to include the pertinent summary of air quality analysis for spoils hauling in the San Joaquin Valley Air Pollution Control District.
- Table 8-2, Comparison of High-Speed Rail Build Alternatives, was updated under Hazardous Materials and Wastes to include the revised estimates for total hazardous wastes for the Refined SR14 and SR14A Build Alternatives and to include information about the potential environmental concerns (PECs).
- Table 8-2, Comparison of High-Speed Rail Build Alternatives, was updated under Parks, Recreation and Open Space to include the number of parks and recreational resources affected by each Build Alternative.
- Table 8-2, Comparison of High-Speed Rail Build Alternatives, was updated under Biological and Aquatic Resources, Hydrology and Water Resources, and Geology, Soils, Seismicity, and Paleontological Resources to account for changes in impacts associated with the Bee Canyon and Pacoima Wash Design Refinement.
- Table 8-2, Comparison of High-Speed Rail Build Alternatives, was updated under Geology, Soils, Seismicity, and Paleontological Resources to include a comparison of acres of temporary and permanent surface footprint within soil areas that are highly corrosive to steel.
- Table 8-2, Comparison of High-Speed Rail Build Alternatives, was updated under Cultural Resources, to clarify the resources present in the study areas for the six Build Alternatives as summarized in Table 3.17, Comparison of High-Speed Rail Build Alternatives for Cultural Resources, discussed in Section 3.17, Cultural Resources.
- Section 8.4.2.12, Cultural Resources, was updated to clarify the numbers of resources affected.
- Section 8.3.1, Burbank Airport Station Options Considered, was updated to provide additional information regarding the approval status of the Burbank Airport Station.
- Section 8.4.2.8, Hazardous Materials and Wastes, was updated to provide additional information regarding spoils deposition at Vulcan Mine.
- Section 8.7, Least Environmentally Damaging Practicable Alternative, has been revised to reflect U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) concurrence on Checkpoint C including the relevant concurrence dates.

- Footnote 6 has been updated to reflect concurrence from the State Historic Preservation Officer on the Finding of Effect.

The revisions and clarifications provided in this section of the Final EIR/EIS do not change the impact conclusions presented in the Draft EIR/EIS.

8.1 Introduction

This chapter identifies the Preferred Alternative for the Palmdale to Burbank Project Section of the California High-Speed Rail (HSR) System. The Preferred Alternative is the SR14A Build Alternative, which includes the Burbank Airport Station. Figure 8-1 shows the Preferred Alternative. Identification of the Preferred Alternative is based on the data and analysis presented in this Final EIR/EIS and 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 during ongoing public outreach conducted by the California HSR Authority (Authority) since that time. Section 8.4 provides additional context about the factors that influenced the selection process whereby the Authority identified SR14A as the Preferred Alternative.

8.1.1 Project Characteristics

This Final EIR/EIS provides information on the relative differences among physical and operational characteristics and the potential environmental consequences associated with the Build Alternatives and station location option, including the following:

- **Physical/Operational Characteristics:**
 - Alignment
 - Length
 - Capital cost
 - Travel time
 - Ridership
 - Constructability
- **Community and 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, Native American sites, and historic properties)
 - Natural environment (geology and seismic hazards, hydrology and water resources, and biological and aquatic resources)
 - 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 evaluation of the Palmdale to Burbank corridor as recorded in the following documents:

- *Final Program EIR/EIS for the Proposed California High-Speed Train System (2005 Statewide Final Program EIR/EIS) (Authority and Federal Railroad Administration [FRA] 2005)*

- Preliminary Palmdale to Los Angeles Alternatives Analysis Report (Authority and FRA 2010)
- Supplemental Palmdale to Los Angeles Alternatives Analysis Report (Authority and FRA 2012a)
- Palmdale to Los Angeles Supplemental Alternatives Analysis Report (Authority and FRA 2012b)
- Palmdale to Los Angeles Supplemental Alternatives Analysis Report (Authority and FRA 2014a)
- Palmdale to Burbank Project Section Supplemental Alternatives Analysis Report (Authority and FRA 2016)
- Checkpoint B Summary Report¹ (Authority 2019)
- Connecting and Transforming California: 2016 Business Plan (Authority 2016)
- Connecting California, Expanding Economy, Transforming Travel: 2018 Business Plan (Authority 2018b)

The 2018, 2020, 2022, and Draft 2024 Business Plans are available at www.hsr.ca.gov. The other documents are available for review at the Authority's offices in Sacramento and Los Angeles, or copies may be requested from the Authority.

¹The *Checkpoint B Summary Report* (Authority 2019) document identifies reasonable and potentially practicable alternatives to be evaluated in the EIS for the Palmdale to Burbank Project Section (see Section 8.2.3.4).



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
 Source: Authority, 2020; National Geographic, 2021
 March 25, 2024

○ Approved HSR Station	HSR Alignment Profile	Anges National Forest
• Metrolink Station	At Grade	Magic Mountain Wilderness Areas
— Metrolink	At Grade Covered	San Gabriel Mountains National Monument
— Other HSR Project Section	Cut and Cover	
	Elevated / Aerial Structure	
	Retained Cut / Trench	
	Tunnel	

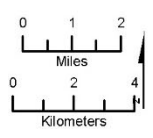


Figure 8-1 Palmdale to Burbank Project Section Preferred Alternative and Station

8.2 Summary of Public Comments

Since publication of the Preliminary Alternatives Analysis document (Authority and FRA 2010), public engagement for key environmental stakeholders has occurred, with outreach meetings and events held in communities along the proposed HSR alignments. The Authority has held and participated in meetings with many individuals, local governments, tribes, public agencies, and organizations to share information and obtain feedback. 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.

The Authority issued a NOP on July 24, 2014, initiating public scoping for the Palmdale to Burbank Project Section EIR/EIS. The FRA published the NOI in the Federal Register on July 24, 2014. Since publication of the 2014 Publication/Notice of Intent, the Authority has held more than 240 individual and group meetings in the Palmdale to Burbank area. Frequently asked questions received via email, phone calls, public information meetings, and one-on-one discussions with stakeholders pertained to the following:

- Sensitive plant and animal habitat
- Water and groundwater
- Community character
- Air quality
- Noise and vibration
- Traffic circulation

Other commonly asked questions included concerns about alternative alignments, station locations, environmental justice, and impacts on communities.

Table 8-1 identifies the key issues identified during planning and alternatives development since 2014.

Table 8-1 Key Issues Considered during Development of Alternatives and EIR/EIS

Topic	Key Issues
Protection of communities and the environment	<ul style="list-style-type: none"> ▪ Air quality and global climate change impacts ▪ Use of clean, renewable electricity ▪ Impacts on domestic and wild animals ▪ Impacts on the Angeles National Forest and San Gabriel Mountains National Monument ▪ Impacts on parks and other open space ▪ Potential negative effects on archaeological sites ▪ Impacts on growth and communities ▪ Impacts on community character ▪ Impacts of electromagnetic and interference/fields ▪ Impacts on biological resources and wetlands ▪ Impacts of tunneling on hydrology ▪ Impacts on oil fields and wells ▪ Negative visual impacts ▪ Noise and vibration evaluations

Topic	Key Issues
Safety	<ul style="list-style-type: none"> ▪ General safety and security ▪ Risk of seismic activities
Transportation	<ul style="list-style-type: none"> ▪ Station area access ▪ Station relocation ▪ Impacts on existing travel routes

Source: Authority and FRA, 2014b

See Chapter 9, Public and Agency Involvement, for a detailed summary of all public and agency involvement during development of this EIS/EIR document.

8.3 Alternatives Considered

In 2010, the Authority and FRA prepared the Preliminary Alternatives Analysis Report that outlined the initial range of alternatives between Palmdale and Burbank. 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 six Build Alternatives.

The six Build Alternatives studied in this Final EIR/EIS have evolved through a comprehensive effort by the Authority to find ways to implement the California HSR System between the Antelope Valley and the Los Angeles Basin, considering community input, the engineering challenges of crossing the San Gabriel Mountains, and the evolution of tunnel experience in other transportation systems worldwide. The six Build Alternatives differ in linear mileage, location, and extent of tunnel, at-grade, and elevated sections of alignment, and present tradeoffs as discussed in Section 8.4. Please refer to Chapter 2, Alternatives, for a more detailed discussion of the development of the six Build Alternatives, including the options previously considered for the Burbank Airport Station.

Each of the six Build Alternatives—Refined SR14, SR14A, E1, E1A, E2, and E2A—would begin and end at the same location. The northern terminus of the Build Alternatives is Spruce Court in the City of Palmdale, which connects the Palmdale to Burbank Project Section to the approved Bakersfield to Palmdale Project Section. The southern terminus of the six Build Alternatives is the approved Burbank Airport Station. The HSR alignment would continue towards Los Angeles on the approved Burbank to Los Angeles Project Section alignment.

The Refined SR14 alignment between Palmdale and the Santa Clara River crossing (just outside the city of Santa Clarita) would follow the SR 14 freeway corridor. After crossing the Santa Clara River near Lang Station Road, the Refined SR14 Build Alternative would turn southerly and enter a 13-mile-long tunnel beneath portions of the ANF, including the SGMNM. The Refined SR14 Build Alternative would emerge from the tunnel and transition to an at-grade alignment near Branford Street in the Pacoima neighborhood of the city of Los Angeles.

The 2015 SAA Report introduced several East Corridor alignments to make a more direct connection between Palmdale and Burbank than previous options, by incorporating long tunnels beneath portions of the ANF, including the SGMNM. The E1 Build Alternative was one of several options introduced in the 2015 SAA Report, substantially refined in the 2016 SAA Report, and recommended in the Checkpoint B Summary Report for further analysis in this Final EIR/EIS. The E1 Build Alternative was intended to provide a shorter, faster, less disruptive route to connect Palmdale and Burbank compared to a corridor along the SR 14 freeway.

The Authority developed the E1A Build Alternative to reduce impacts on aquatic resources south of the city of Palmdale. As the E1A Build Alternative was developed based on the E1 Build Alternative, the above description of the E1 Build Alternative applies to the E1A Build Alternative.

The E2 alignment was one of several options introduced in the 2015 SAA Report, substantially refined in the 2016 SAA Report, and recommended in the Checkpoint B Summary Report for further analysis in this Final EIR/EIS. E2 is intended to provide a shorter, faster, and potentially less disruptive route to connect Palmdale and Burbank than alignments more strictly following the SR 14 freeway corridor.

Through consultation with resource agencies, the Authority developed the E2A Build Alternative to reduce impacts on aquatic resources south of the city of Palmdale. As the E2A Build Alternative was developed based on the E2 Build Alternative, the above description of the E2 Build Alternative applies to the E2A Build Alternative, unless otherwise noted.

8.3.1 Burbank Airport Station Options Considered

The Palmdale to Burbank Project Section considered several Burbank Airport Station options, which were analyzed in the 2016 SAA Report. The 2016 SAA Report evaluated three station options in Burbank: Option A, which featured mostly at-grade and above-grade facilities within the city of Burbank and the Sun Valley community; Option B, which featured both at-grade and underground facilities within the city of Burbank; and Option C, which featured both at-grade and underground facilities aligned in a north-south orientation parallel to North Hollywood Way, within the city of Burbank. Upon further evaluation of the three Burbank Airport Station options, the 2016 Palmdale to Burbank SAA carried forward Option A and Option B due to corresponding Palmdale to Burbank alignment alternatives carried forward, while Option C was withdrawn, as the associated Palmdale to Burbank alignment alternative was also withdrawn in this SAA. The engineering within the Palmdale to Burbank Project Section was advanced sufficiently to make it practical for the proposed Palmdale to Burbank alignment alternatives to connect to either Burbank Airport Station Platform Configuration Option A or Option B. Therefore, in 2018, the Authority withdrew Option A based on the Burbank Airport Station Option Screening Report (Authority 2018a), primarily due to community and potential environmental justice concerns. Option A had the greatest amount of residential and business displacements and noise/vibration and visual impacts, and it also had the worst intermodal connections. Station Option B was carried forward as part of the HSR Build Alternatives, and then further refined to minimize impacts. Option B Refined was designed to locate the platforms closer to the future location of the Hollywood Burbank Airport terminal, reduce the station depth, improve constructability, reduce commercial and industrial property takes, and eliminate the tunnel length underneath residential neighborhoods to the south. Option B Refined Burbank Airport Station option was carried forward for the Preferred Alternative.

The Burbank Airport Station is at the southern end of the Palmdale to Burbank Project Section and was evaluated as part of the Burbank to Los Angeles Project Section. The Burbank Airport Station area is an overlap area (common element) between the two California HSR system sections. The Burbank to Los Angeles Project Section Final EIR/EIS was released on November 5, 2021, and contains the full analysis of the Burbank Airport Station. The Authority's Board approved the Burbank to Los Angeles Project Section Preferred Alternative, including the Burbank Airport Station, on January 20, 2022. The information regarding the Burbank Airport Station is for context, reference, and informational purposes only.

8.4 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 has identified the SR14A Build Alternative as the Preferred Alternative for the Palmdale to Burbank Project Section, with the Burbank Airport Station. The Burbank Airport Station would have both underground and aboveground facilities and would include train boarding platforms, a station building (which would house ticketing areas, passenger waiting areas, restrooms, and related facilities), pickup/drop-off facilities for private automobiles, a transit center for buses and shuttles, surface parking areas, and stormwater capture/drainage facilities. The Burbank Airport Station would begin near Kenwood Street and extend to just north of Winona Drive and the Burbank Airport east/west

runway. The SR14A Build Alternative would include 38.38 miles of alignment with six different track profiles: at grade, at grade covered, cut-and-cover, retained cut/trench profile, tunnel, and elevated/aerial structure in a variety of land uses and ecoregions, including urban, rural, and mountainous terrain in Southern California. From the north, the SR14A Build Alternative would begin at Spruce Court in Palmdale², continue south and turn west to cross under the community of Acton, continue southwest and turn south to travel beneath the Angeles National Forest (ANF), including the San Gabriel Mountains National Monument (SGMNM), and then enter the San Fernando Valley where it would connect with the Burbank Airport Station.

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 six Build Alternatives. Furthermore, many impacts on the natural environment and community resources would be the same, or very similar, across each of six 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 each of the six Build Alternatives, to identify a Preferred Alternative, various differentiators were determined based on stakeholder, agency, and community input.

The Authority weighed a variety of 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 other differentiators to identify what the Authority believes is the best Build Alternative to achieve the project's Purpose and Need. compares the various environmental resource impacts evaluated in this Final EIR/EIS for the Refined SR14, SR14A, E1, E1A, E2, and E2A Build Alternatives. Figure 8-2 depicts the Build Alternatives evaluated in this Final EIR/EIS and the accompanying station.

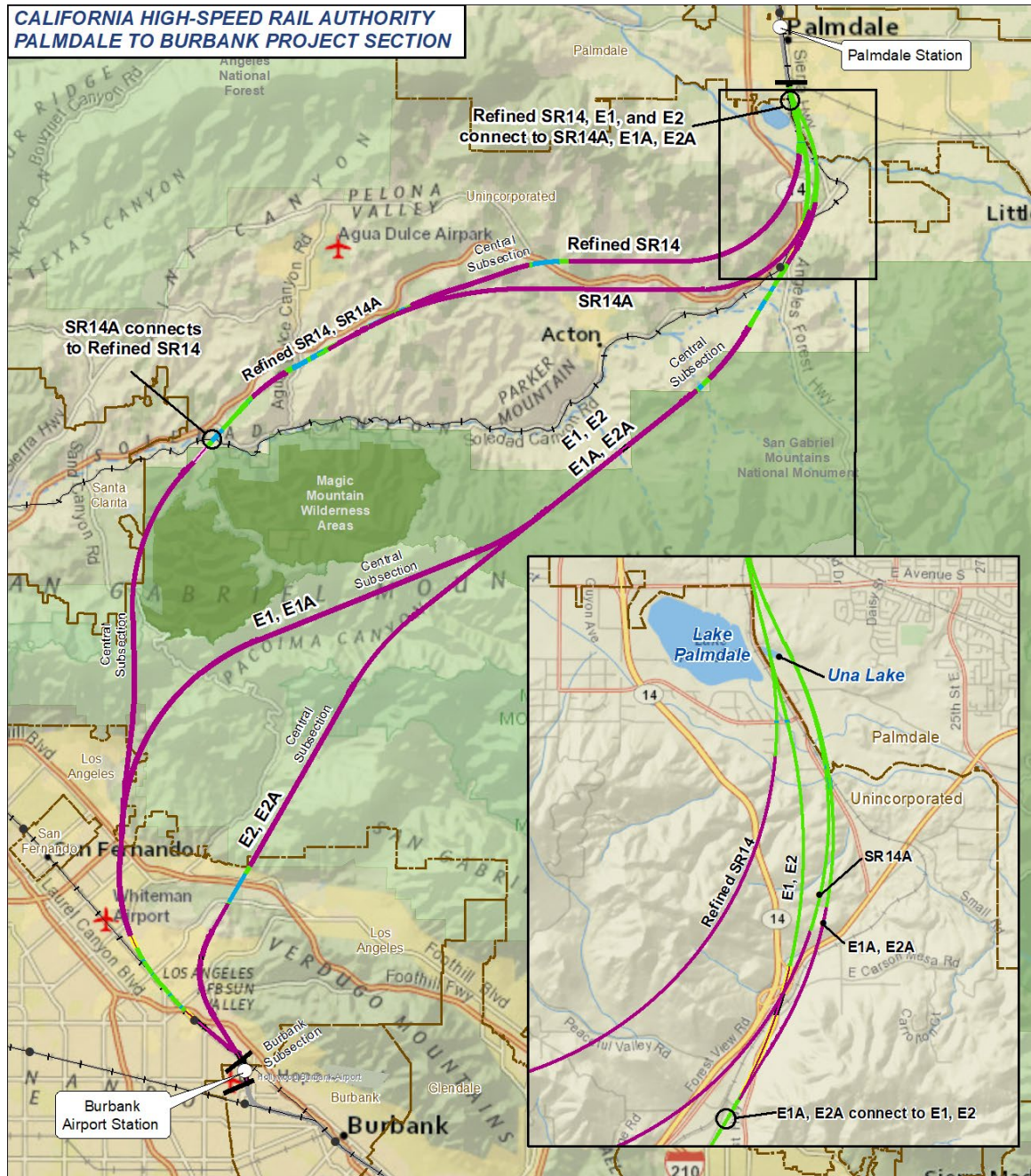
A portion of each of the six Build Alternatives evaluated in this Final EIR/EIS would cross under the ANF, including the SGMNM. Minimizing the potential for adverse effects on the natural resources in ANF including SGMNM, particularly effects on groundwater and surface water, was key in evaluating and determining a Preferred Alternative. In addition, the six Build Alternatives would include long deep bored tunnels under the ANF, including the SGMNM. Constructability issues such as rock quality and effects associated with squeezing ground, in-situ stresses, and groundwater pressures on the tunnel lining system, were key factors in evaluating and identifying a Preferred Alternative for the Palmdale to Burbank Project Section.

The Preferred Alternative also integrates the Authority's evaluation under Section 4(f) of the Department of Transportation Act (U.S.C. Title 49, Section 303) (Section 4(f)), which provides special protection to publicly owned public parks; recreational areas of national, state, or local significance; wildlife or waterfowl refuges; and lands of a historic site of national, state, or local significance. As described in Chapter 4, Final Section 4(f) and 6(f) Evaluations, Section 4(f) properties can only be used by federally funded transportation projects if there is no feasible and prudent Build Alternative, and planning has been undertaken to minimize harm to 4(f) property used by the project. For more information on the Authority's evaluation under Section 4(f), see Chapter 4, Final Section 4(f) and Section 6(f) Evaluations.

² The SR14A Build Alternative connects to the Bakersfield to Palmdale Project Section approved by the Board on June 25, 2021.

8.4.1 Environmental Factors Influencing Selection of a Preferred Alternative

The comparative evaluation presented in provides information on the environmental topics for which the Build Alternatives are substantively different and does not focus on resource topics for which the impacts of the Build Alternatives would be similar or would not be significant. The table summarizes the key differentiating impacts on natural resources (e.g., impacts on aquatic resources and special-status species), as well as impacts of the Build Alternatives on community-based resources. Where applicable, cells below are labeled with an asterisk to denote the least impactful Build Alternative; if all six Build Alternatives would have equal impacts, no asterisk is noted. Determination of least impactful alternative reflects a combination of professional, qualitative judgment with the quantitative measure of impacts. For instance, when the affected resources varied more by habitat value than by acreage, the determination reflects the value of impacts based on professional judgment in addition to quantity.



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HSR ALIGNMENT IS NOT DETERMINED
 Source: Authority, 2020; National Geographic, 2021
 March 14, 2024

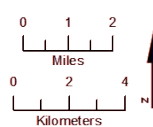
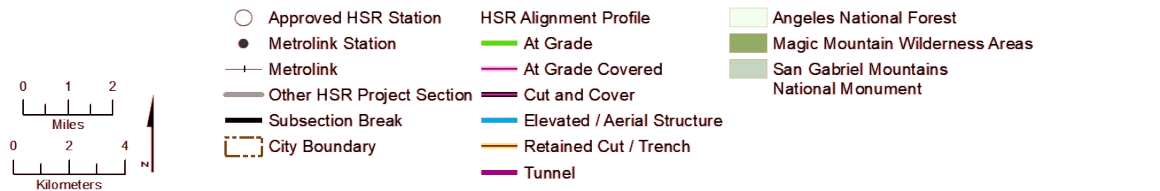


Figure 8-2 Palmdale to Burbank Project Section Build Alternatives and Station

Table 8-2 Key Comparison of High-Speed Rail Build Alternatives

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A
Transportation						
Construction Impacts						
Number of roadway segments where the LOS would degrade to an unacceptable level during northbound spoils hauling	*AM peak hour: 2 roadway segments PM peak hour: 1 roadway segments	AM peak hour: 2 roadway segments PM peak hour: 2 roadway segments	AM peak hour: 4 roadway segments PM peak hour: 4 roadway segments	AM peak hour: 4 roadway segments PM peak hour: 5 roadway segments	AM peak hour: 3 roadway segments PM peak hour: 4 roadway segments	AM peak hour: 3 roadway segments PM peak hour: 5 roadway segments
Number of roadway segments where the LOS would degrade to an unacceptable level during southbound spoils hauling	*AM peak hour: 2 roadway segments PM peak hour: 2 roadway segments	AM peak hour: 2 roadway segments PM peak hour: 3 roadway segments	AM peak hour: 4 roadway segments PM peak hour: 4 roadway segments	AM peak hour: 5 roadway segments PM peak hour: 5 roadway segments	AM peak hour: 2 roadway segments PM peak hour: 3 roadway segments	AM peak hour: 3 roadway segments PM peak hour: 4 roadway segments
Number of intersections (including new intersections) where the LOS would degrade to an unacceptable level during northbound spoils hauling	AM peak hour: 4 intersections PM peak hour: 5 intersections	AM peak hour: 5 intersections PM peak hour: 7 intersections	AM peak hour: 6 intersections PM peak hour: 7 intersections	AM peak hour: 5 intersections PM peak hour: 7 intersections	AM peak hour: 4 intersections PM peak hour: 3 intersections	*AM peak hour: 3 intersections PM peak hour: 3 intersections.
Number of intersections (including new intersections) where the LOS would degrade to an unacceptable level during southbound spoils hauling	AM peak hour: 6 intersections PM peak hour: 6 intersections	AM peak hour: 7 intersections PM peak hour: 8 intersections	AM peak hour: 6 intersections PM peak hour: 7 intersections	AM peak hour: 6 intersections PM peak hour: 7 intersections	*AM peak hour: 3 intersections PM peak hour: 3 intersections	*AM peak hour: 3 intersections PM peak hour: 3 intersections

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A
Number of freeway segments where the LOS would degrade to an unacceptable level during southbound spoils hauling	AM peak hour: 2 freeway segments PM peak hour: 2 freeway segments	AM peak hour: 2 freeway segments PM peak hour: 2 freeway segments	*AM peak hour: 1 freeway segment PM peak hour: 2 freeway segments	*AM peak hour: 1 freeway segment PM peak hour: 2 freeway segments	*AM peak hour: 1 freeway segment PM peak hour: 2 freeway segments	*AM peak hour: 1 freeway segment PM peak hour: 2 freeway segments
Number of roadway segments where the LOS would degrade to an unacceptable level during project construction	AM peak hour: 1 roadway segments PM peak hour: 1 roadway segments	AM peak hour: 1 roadway segments PM peak hour: 1 roadway segments	AM peak hour: 1 roadway segments PM peak hour: 1 roadway segments	AM peak hour: 1 roadway segments PM peak hour: 1 roadway segments	AM peak hour: 1 roadway segments PM peak hour: 1 roadway segments	AM peak hour: 1 roadway segments PM peak hour: 1 roadway segments
Number of intersections (including new intersections) where the LOS would degrade to an unacceptable level during project construction	AM peak hour: 3 intersections PM peak hour: 4 intersections	AM peak hour: 3 intersections PM peak hour: 4 intersections	AM peak hour: 1 intersection PM peak hour: 2 intersections	*AM peak hour: 1 intersection PM peak hour: 1 intersection	AM peak hour: 1 intersection PM peak hour: 2 intersections.	*AM peak hour: 1 intersection PM peak hour: 1 intersection

Operations Impacts - No key differentiating effects among HSR Build Alternatives

Air Quality and Global Climate Change

Construction Impacts

Criteria pollutant emissions during project construction would exceed General Conformity <i>de minimis</i> levels		The Build Alternatives would exceed annual General Conformity <i>de minimis</i> levels. The following cells list years where exceedances would occur for each criteria pollutant listed below.					
Criteria pollutant	Air Basin	Exceedance Years	Exceedance Years	Exceedance Years	Exceedance Years	Exceedance Years	Exceedance Years
VOCs	SCAB	None	None	None	None	None	None

Impact		HSR Build Alternative					
		Refined SR14	SR14A	E1	E1A	E2	E2A
NO _x	MDAB	None	None	None	None	None	None
	SJVAB	None	None	None	None	None	None
	SCAB	*2021 - 2025	2020 - 2026	2021 - 2026	2021 - 2026	2021 - 2026	2021 - 2026
	MDAB	*None	*None	*None	*None	*None	2023
NO ₂ ¹	SCAB	None	None	None	None	None	None
	SJVAB	None	None	None	None	None	None
CO	SCAB	2023	2022 - 2023	*None	*None	*None	2022, 2024 - 2025
	MDAB	None	None	None	None	None	None
	SJVAB	None	None	None	None	None	None
SO ₂ ²	SCAB	None	None	None	None	None	None
	MDAB	None	None	None	None	None	None
	SJVAB	None	None	None	None	None	None
PM ₁₀	SCAB	None	None	None	None	None	None
	MDAB	None	None	None	None	None	None
	SJVAB	None	None	None	None	None	None
PM _{2.5}	SCAB	None	None	None	None	None	None
	MDAB	None	None	None	None	None	None
	SJVAB	None	None	None	None	None	None
Criteria pollutant emissions during project construction would exceed CEQA thresholds		The Build Alternatives would exceed CEQA thresholds. Exceedances would occur for each criteria pollutant as listed below (yearly unless otherwise noted).					
Criteria pollutant	Air District	Exceedance Years	Exceedance Years	Exceedance Years	Exceedance Years	Exceedance Years	Exceedance Years

Impact		HSR Build Alternative					
		Refined SR14	SR14A	E1	E1A	E2	E2A
VOCs	SCAQMD (daily)	None	None	None	None	None	None
	AVAQMD	None	None	None	None	None	None
	SJVAPCD	None	None	None	None	None	None
NOx	SCAQMD (daily)	2020 - 2025	2020 - 2027	*2021 - 2025	*2021 - 2025	2021-2026, 2028	*2021 - 2025
	AVAQMD	*None	*None	*None	*None	*None	2023
	SJVAPCD	None	None	None	None	None	None
CO	SCAQMD (daily)	*2021 - 2023	2020 - 2024	*2023	*2023	2021 - 2025	*2023
	AVAQMD	None	None	None	None	None	None
	SJVAPCD	None	None	None	None	None	None
SO ₂ ¹	SCAQMD (daily)	None	None	None	None	None	None
	AVAQMD	None	None	None	None	None	None
	SJVAPCD	None	None	None	None	None	None
PM ₁₀	SCAQMD (daily)	None	None	None	None	None	None
	AVAQMD	None	None	None	None	None	None
	SJVAPCD	None	None	None	None	None	None
PM _{2.5}	SCAQMD (daily)	None	None	None	None	None	None
	AVAQMD	None	None	None	None	None	None
	SJVAPCD	None	None	None	None	None	None
Health risks from construction emissions		None of the six Build Alternatives would result in exceedance of applicable thresholds for cancer risk or for chronic and acute noncancer health impacts.					
Increased cancer risk exceeding thresholds for residential sensitive receptors		No	No	No	No	No	No
Increased noncancer health risk (chronic and acute) exceeding thresholds for residential sensitive receptors		No	No	No	No	No	No

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A
Total construction GHG emissions (metric tons CO ₂ e) ³	*134,000	171,000	142,000	154,000	140,000	179,000
Operations Impacts - No key differentiating effects among HSR Build Alternatives						
Noise and Vibration						
Construction Impacts						
Noise-sensitive areas affected by traffic noise from truck trips hauling construction spoils	Big Springs Road northwest of Acton	*No severe construction noise impacts from spoils hauling are anticipated for this Build Alternative	Portals: Aliso Canyon Road, Soledad Canyon Road, and Crown Valley Road south of Palmdale Adit: Sand Canyon Road and Placerita Canyon Road in ANF	Portals: Aliso Canyon Road, Soledad Canyon Road, and Crown Valley Road south of Palmdale Adit: Sand Canyon Road and Placerita Canyon Road in ANF	Wheatland Avenue in the Shadow Hills neighborhood; Foothill Boulevard in the Lake View Terrace neighborhood; Aliso Canyon Road, Soledad Canyon Road, and Crown Valley Road south of Palmdale	Wheatland Avenue in the Shadow Hills neighborhood; Foothill Boulevard in the Lake View Terrace neighborhood; Aliso Canyon Road, Soledad Canyon Road, and Crown Valley Road south of Palmdale
Operations Impacts						
Number of sensitive receivers affected by noise effects and vibration and groundborne noise effects.	Noise Effects					
	Moderate: 129	*Moderate: 99	Moderate: 143	Moderate: 173	Moderate: 141	Moderate: 168
	Severe: 55	*Severe: 19	Severe: 108	Severe: 44	Severe: 164	Severe: 102
	Vibration and Ground-Borne Noise Effects					
	Residential: 27	Residential: 27	Residential: 20	Residential: 20	*Residential: 0	*Residential: 0
Institutional: 1	Institutional: 1	Institutional: 1	Institutional: 1	*Institutional: 0	*Institutional: 0	

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A
Locations where domestic animals may experience startle effects within 50 feet of the alignment	Pacific Crest Trail, Vasquez Rocks Natural Area Park	Pacific Crest Trail, Vasquez Rocks Natural Area Park	*None	*None	Hansen Dam Recreation Area, and Stonehurst Park and Recreation Area	Hansen Dam Recreation Area, and Stonehurst Park and Recreation Area
Electromagnetic Fields and Electromagnetic Interference - No key differentiating effects among HSR Build Alternatives during construction or operation						
Public Utilities and Energy						
Construction Impacts						
Total temporary construction interruption of utility services	461	410	400	345	278	*264
Total construction water demand (acre-feet per year)	1,033 ⁴	1,371	848	1,169	*603	945
Operations Impacts - No key differentiating effects among HSR Build Alternatives						
Biological and Aquatic Resources						
Construction and Operations Impacts						
Number of affected special-status plant species	No differentiating effects among the Build Alternatives. The six Build Alternatives would affect the same 3 FESA-listed special-status plant species and 42 non-FESA-listed special-status plant species					
Acreage of affected wetland waters of the U.S.	8	*1	8 – 9 ⁴	1 – 3 ⁴	15	8
Acreage of affected nonwetland waters of the U.S.	40 – 42 ⁴	26 – 30 ⁴	33 – 34 ⁴	20 – 21 ⁴	27 – 28 ⁴	*14 – 15⁴
Acreage of affected additional waters of the State	6	*2	7	*2	7	*2
Acreage of affected CDFW riparian habitat	29 – 44 ⁴	20 – 47 ⁴	31 – 36 ⁴	25 – 30 ⁴	24 – 25 ⁴	*18 – 20⁴
Acreage of affected CDFW lakes and streambeds	50 – 52 ⁴	29 – 33 ⁴	44 – 46 ⁴	*28 – 30⁴	53 ⁴	38 ⁴
High risk of impacts on aquatic resource subject to Section 1600 et seq. regulation from groundwater depletion in ANF (linear miles)	*3.2	*3.2	5.5	5.5	9.9	9.9
Risk of Secondary Effects from Tunnel Construction ³	*Lowest Risk	*Lowest Risk	High Risk	High Risk	Highest Risk	Highest Risk

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A
Non-urban portions of the Build Alternative alignment (tunnel and viaduct) that would be permeable to wildlife movement	*83%	*83%	80%	*83%	79%	82%
Non-urban portions of the Build Alternative alignment (at-grade) that would restrict wildlife movement	*17%	*17%	20%	*17%	21%	18%
Hydrology and Water Resources						
Construction Impacts						
Acres of construction-period ground disturbance within special flood hazard areas	*279 – 281 ⁴	291 – 293	306	306	422	421
Acres of permanent footprint within floodplains	*279 – 281 ⁴	291 – 293	306	306	422	421
Number of groundwater basins crossed by construction footprint	4	3	3	1	2	*0
Number of viaduct waterbody crossings	12	*3	7	3	8	*3
Length of tunnels (miles) beneath ANF	*7.28	*7.28	17.86	17.86	17.90	17.90
Width (feet) of gouge, crushed, and sheared rock fault zones	1,180	1,180	*860	*860	2,820	2,820
Streams in ANF within 1 mile of Build Alternative alignment	*11	*11	22	22	39	39
Length (miles) of tunnels in Groundwater Pressure above 25 bar	*1.6	*1.6	6.9	6.9	6.6	6.6
Private wells within or near ANF, including SGMNM	*14	*14	38	38	25	25
Operations Impacts - No key differentiating effects among HSR Build Alternatives						
Geology, Soils, Seismicity, and Paleontological Resources						
Construction Impacts						
Acres of permanent subsurface footprint within high subsidence potential zones	30	95	*16	35	*16	35

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A
Acres of temporary and permanent surface footprint in areas of known karst terrain	266	152	*0	*0	*0	*0
Acres of temporary footprint within dam inundation zones	551 – 586	539 – 574	480 – 496	551 – 570	*173	331
Linear miles of bored tunnel through geologic units with high paleontological sensitivity	7.80/6.51	9.54/8.57	*4.76/3.42	6.06/3.58	4.77/3.31	6.07/3.47
Acres of temporary and permanent surface footprint within soil areas that are highly corrosive to steel	822	832	447	436	447	*399
Operations Impacts - No key differentiating effects among HSR Build Alternatives						
Hazardous Materials and Wastes						
Construction Impacts						
Estimated hazardous spoils (million cubic yards)	6.8	6.8	*3.0 ⁷	*3.0 ⁷	3.8 ⁷	3.8 ⁷
Number of high-priority PEC ⁸ sites within construction footprint	26	26	24	24	21	*20
Number of educational facilities within the educational facility RSA (0.25 mile of construction footprint)	18–23 ⁴	21–26 ⁴	10	10	*6	*6
Operations Impacts						
Number of educational facilities within the educational facility RSA (0.25 mile of operational footprint)	18–23 ⁴	21–26 ⁴	10	10	*6	*6
Safety and Security – No key differentiating effects among HSR Build Alternatives during construction or operation						
Socioeconomics and Communities						
Construction Impacts						
Total single-family residential units displaced	38–41 ³	*8–11 ³	13–18 ³	12–17 ³	38	37
Total multifamily residential units displaced	13	29	*11	27	*11	27
Total businesses displaced	214 – 231 ^{4,6}	213 – 230 ^{4,6}	213 – 230 ^{4,6}	215 – 232 ^{4,6}	121 ⁶	123 ^{4,6}

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A
Operations Impacts – No key differentiating effects among HSR Build Alternatives						
Station Planning, Land Use, and Development – No key differentiating effects among HSR Build Alternatives						
Agricultural Farmland and Forest Land – No key differentiating effects among HSR Build Alternatives						
Parks, Recreation, and Open Space						
Number of parks, recreation, and open space resources affected	22	23	17	18	*13	14
Aesthetics and Visual Quality						
Construction Impacts						
Number of KVPs with decreased visual quality	6	*2	*2	*2	4	4
Operations Impacts – No key differentiating effects among HSR Build Alternatives						
Cultural Resources						
Construction Impacts						
Number of known archaeological resources present ⁵	19	11	14	*9	12	*9
Number of historic built resources present	*3	*3	6	6	5	5
Operations Impacts – No known or unknown archaeological resources would be affected by operations impacts						
Number of historic built resources present	*3	*3	6	6	5	5
Regional Growth – No key differentiating effects among HSR Build Alternatives during construction or operations						
Section 4(f)						
Number of Section 4(f) properties incurring a use	*8⁹	*7⁹	10	10	12	12

Impact	HSR Build Alternative					
	Refined SR14	SR14A	E1	E1A	E2	E2A

Disproportionately high and adverse effects findings are described in Chapter 5, Environmental Justice.

Environmental Justice – No key differentiating effects among HSR Build Alternatives during construction or operations

* = least impactful alternative(s)

1 As the SCAB is in maintenance for the NO₂ NAAQS, the alternative’s emissions must be compared to the NO₂ *de minimis* level. As NO₂ is a subset of NO_x, for the purposes of this analysis, the NO₂ emissions are assumed to be equal to the NO_x emissions. A NO₂ analysis was not required for the MDAB or SJVAB because NO₂ is in attainment for these basins.

2 SO₂ is a precursor for PM_{2.5}

3 Numbers in this row have been rounded.

4 The Build Alternatives would require adits and intermediate windows for construction access to tunneled portions of the alignment. This table includes ranges of quantifiable impacts that would result from the selection of each adit and intermediate window combination.

5 Per the Section 106 Programmatic Agreement (Authority and FRA 2011), the recorded archaeological sites in the project area of potential effect that have not been evaluated for National Register of Historic Places eligibility will be revisited and will undergo a phased evaluation.

6 Construction of a 1.25-million-square-foot campus known as Avion Burbank, including light industrial, office, retail, and hotel uses, is substantially complete. Because the Avion Burbank development will likely be completed and occupied prior to right-of-way acquisition and relocation activities resulting from the California HSR System, the analysis below has been updated to include these business displacements.

7 The amount of hazardous spoils for the E1, E1A, E2, and E2A Build Alternatives is expected to be less than 3.0 mcy (E1 and E1A) and 3.8 mcy (E2 and E2A). These volumes are based on the assumption that 100 percent of the spoils in the Burbank area would be hazardous; however, the percentage of spoils that would be hazardous in the Burbank area is closer to 42 percent (see Section 3.10.4.3). The 3.0 and 3.8 mcy volumes have not been updated in the Final EIR/EIS because these updates would not change any significance conclusions and because the Final EIR/EIS quantitatively analyzes a conservative scenario with the SR14A and Refined SR14 Build Alternatives.

8 The PEC designation applies to specific sites where there is a possibility of existing, past, or potential hazardous materials release into soil, groundwater, or surface water.

9 The Refined SR14 and SR14A Build Alternatives would result in a permanent use to the Lang Station Open Space. Except for the Section 4(f) use at Lang Station Open Space (the Refined SR14 and SR14A Build Alternatives), the impacts to park, recreation, and open-space resources and cultural resources would be *de minimis*

ANF = Angeles National Forest; Authority = California High-Speed Rail Authority; AVAQMD = Antelope Valley Air Quality Management District; CDFW = California Department of Fish and Wildlife; CEQA = California Environmental Quality Act; CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; FESA = federal Endangered Species Act; FRA = Federal Railroad Administration; GHG = greenhouse gas; HSR = high-speed rail; KVP = key viewpoint; LOS = level of service; MDAB = Mojave Desert Air Basin; NO_x = nitrogen oxides; NO₂ = nitrogen dioxide; PEC = potential environmental concern; PM₁₀ = particulate matter 10 microns or smaller in diameter; PM_{2.5} = particulate matter 2.5 microns or smaller in diameter; RSA = resource study area; SCAB = South Coast Air Basin; SCAQMD = South Coast Air Quality Management District; SGMNM = San Gabriel Mountains National Monument; SJVAB = San Joaquin Valley Air Basin; SJVAPCD = San Joaquin Valley Air Pollution Control District; SO₂ = sulfur dioxide; VOC = volatile organic compound

8.4.2 Key Differential Factors Influencing Identification of a Preferred Alternative

Based on the public and agency outreach information outlined in Section 8.2, along with the impact analysis presented in this Final EIR/EIS, the SR14A Build Alternative was selected as the Preferred Alternative. The alternative balances functional, technical, economic, and constructability factors with minimized impacts on natural resources and human communities.

The following resources were not considered differentiators in the evaluation and selection of a Preferred Alternative in this project section because the impacts were of similar magnitude or did not vary widely:

- Electromagnetic fields/electromagnetic interference
- Safety and security
- Station planning, land use, and development
- Agricultural farmland and forest land
- Regional growth
- Environmental justice
- Section 4(f)

A description of the key resource factors used to identify the Preferred Alternative are provided below.

8.4.2.1 Transportation

Construction traffic would result in impacts on roadway segments and intersections. With implementation of mitigation measures, construction-period traffic impacts would be reduced to less than significant levels except for impacts during spoils hauling,³ which would remain significant and unavoidable after mitigation. Overall, the E2A Build Alternative would result in the fewest traffic impacts from spoils hauling. However, it should be noted that automobile delay is not considered a significant impact under the California Environmental Quality Act (CEQA).

8.4.2.2 Air Quality and Global Climate Change

The Build Alternatives would result in exceedances of general thresholds for pollutant emissions resulting from construction activities, spoils hauling, and traffic delays. The Refined SR14 Build Alternative would result in the fewest amount of greenhouse gas emissions during construction. The E2A Build Alternative would result in the most greenhouse gas emissions during construction.

8.4.2.3 Noise and Vibration

Construction of each of the six Build Alternatives would result in similar magnitudes of noise effects because most of the sensitive receivers in the Palmdale to Burbank Project Section are in the Antelope Valley (Palmdale) and San Fernando Valley (Los Angeles neighborhoods, Burbank) where the Build Alternatives would share identical alignments and footprints. However, operational noise impacts would mostly occur around station areas, whereas operational vibration impacts would mostly occur along the alignment. Overall, the SR14A Build Alternative would result in the fewest number of sensitive residential receivers that would experience operational noise impacts. The E2 and E2A Build Alternatives would result in the fewest number of sensitive residential receivers that would experience operational ground-borne noise impacts.

8.4.2.4 Public Utilities and Energy

Project construction would use water to increase the water content of soil to optimize tunneling and compaction for dust control, to prepare concrete, and to re-seed disturbed areas. Wastewater

³ This construction activity would entail trucks hauling the spoils generated by project construction (especially tunnel boring) to disposal sites.

would be generated as a byproduct of these construction activities. Vegetation clearing, removal of existing paved/impervious surfaces, and demolition of existing structures during construction would generate solid waste. The difference in construction-period utility demands among the Build Alternatives is a function of the total trackway length and tunneling, with the SR14A Build Alternative having the highest demands overall because it would have the most tunnel boring machines operating at the same time. The E2 Build Alternative would have the fewest water demands during construction.

8.4.2.5 Biological and Aquatic Resources

Each of the Build Alternatives would have the potential to affect biological resources, including plant species and habitat, wildlife species and habitat, and wetlands. The degree to which the Build Alternatives could affect each biological resource varies, as do the specific resources that each Build Alternative could affect. For example, only the Refined SR14 and SR14A Build Alternatives would require spanning the Santa Clara River to avoid affecting habitat for the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), which is a fully protected species under state law.⁴ The SR14A Build Alternative would have the least effect on wildlife movement because of the total distance of tunnels and viaducts in critical wildlife movement areas. The E2 and E2A Build Alternatives would cross the Big Tujunga Wash, which is habitat for many special-status plant and wildlife species and could result in greater impacts.

The SR14A and E1A Build Alternatives would have the least impact on wetland waters of the U.S. The E2A Build Alternative would have the least impact on nonwetland waters of the U.S.; however, the quality of non-wetland waters affected by E2A would be higher than those affected by SR14A. The surface footprint of the Refined SR14 and SR14A Build Alternatives would have the greatest impacts on federal Endangered Species Act listed plant and wildlife species compared to the E1, E1A, E2, and E2A Build Alternatives. The E1, E1A, E2, and E2A Build Alternatives would have footprint impacts within the Critical Biological Land Use Zone in the ANF, including in the SGMNM, whereas the Refined SR14 and SR14A Build Alternatives would avoid this impact.

Changes in groundwater contribution to surface-water resources resulting from tunneling activities could adversely affect aquatic habitat, altering the amount and quality of aquatic habitats for associated biological resources. The Refined SR14 and SR14A Build Alternatives would have the least potential effects on groundwater that supports habitat for plant species and communities as well as habitat for wildlife. The Refined SR14 and SR14A Build Alternatives would have the least number of impacts from groundwater loss on state and federally protected aquatic resources and on aquatic resources subject to Section 1600 Et. seq. Regulation.

8.4.2.6 Hydrogeology

The risk of water inflow into the tunnels during and after construction of the Palmdale to Burbank Project Section has been identified. This risk could lower groundwater levels in proximity to the selected Preferred Alternative tunnel alignment, which could adversely affect hydrologic conditions for seeps, springs, streams, and wells. As such, this risk has triggered that appropriate mitigation measures be implemented during design and construction, in order to minimize the chances of this undesirable situation, while also minimizing the consequences by reducing the possible water inflow as much as possible. There is a possibility tunnel construction could impact groundwater levels. The impact on groundwater levels from tunnel construction could potentially persist in some areas for several years, however, such conditions would be expected to return to normal over time. Although the Authority would adopt design features and construction methods that would avoid and minimize the potential for groundwater to seep into the tunnel during construction, it is expected that groundwater inflow would occur under certain circumstances, most likely in areas of the six Build Alternatives identified as “High Risk” within the ANF, including

⁴ This designation limits (even more than other protected species) the types of activities that can take place in areas where such species or habitat is located.

the SGMNM. These areas were identified as High Risk because of the presence of faults and high groundwater pressures at the intersection with the Build Alternative tunnel alignments.

Each of the six Build Alternatives has the potential to adversely affect surface water features that are connected to groundwater resources (i.e., seeps, springs, intermittent and perennial streams) as a result of tunnel construction. Although impacts may potentially occur under any of the Build Alternatives, the level of risk and impact potential varies. The Refined SR14 and SR14A Build Alternatives, as compared to E1, E1A, E2, and E2A, would have the lowest potential risk and least potential impacts on surface water resources because the alignment traverses areas with lower groundwater pressures and no known groundwater dependent resources with the identified High and Moderate Risk Areas. The E2 and E2A Build Alternatives would have the highest risk and highest potential impacts on surface water resources when compared to Refined SR14, SR14A, E1, and E1A because of the comparatively higher groundwater pressures and greater prevalence of springs and streams with the identified High and Moderate Risk Areas.

8.4.2.7 Geology, Soils, Seismicity, and Paleontological Resources

Each of the Build Alternatives would cross several fault zones and would therefore be subject to seismic concerns. Because the Build Alternatives would encounter a similar number of fault zones, this would not be a key differentiating factor. Each of the Build Alternatives would require construction of deep, bored tunnels, resulting in the potential for disturbing previously undisturbed soils with high paleontological sensitivity. The E1 Build Alternative would have the fewest linear miles of bored tunnel through geologic units with high paleontological sensitivity. The E2A Build Alternative would have the lowest temporary and permanent surface footprint within soil areas that are highly corrosive to steel.

8.4.2.8 Hazardous Materials and Wastes

Potential environmental concern sites, with a possibility of existing, past, or potential hazardous materials release into soil, groundwater, or surface water, would be present within each of the Build Alternatives' footprints. The E2A Build Alternative would encounter a slightly fewer number of high-priority potential environmental concern sites than would the Refined SR14, SR14A, E1, E1A, and E2 Build Alternatives. Each Build Alternative would generate substantial spoils from major earthwork activities, including cuts, tunneling, adits/intermediate windows, trenches, and other features. Overall, the Refined SR14 and SR14A Build Alternatives would generate the largest volume of potentially contaminated spoils.

As noted in Appendix 2-I, Potential Disposal Plan for Spoils Generated during Construction Activities, three existing mine sites are identified as initial deposition locations for the Palmdale to Burbank Project Section and have been incorporated into the footprint:

- The Vulcan Mine site, south of Lang Station Road within the ANF, is a sand and gravel mining operation. Vulcan Mine would serve as a deposition site for some of the spoils generated by the Refined SR14 and SR14A Build Alternatives. GEO-MM#1 requires that a restoration plan be developed for Vulcan Mine. Therefore, the Refined SR14 and SR14A Build Alternatives would result in the Vulcan Mine being restored to a more natural topography, which would benefit the surrounding environment. The operators of Vulcan Mine are responsible for the restoration and reclamation of the site. Portions of the Vulcan Mine site located within the ANF, including areas within the SGMNM, would also be used for the deposition of all spoils extracted from beneath the SGMNM (which would only occur in the Refined SR14 Build Alternative).
- Excess dirt from tunnel portal 1A and portal 1 would be off-hauled by truck, using existing roadways, to potential disposal sites southeast of Palmdale.
- The Boulevard Mine, located southwest of San Fernando Road in Burbank, would serve as a disposal site for some of the spoils generated by both the Refined SR14 Build Alternative, SR14A Build Alternative, E1 Build Alternative, and the E1A Build Alternative.

- The CalMat Mine, located northwest of Peoria Street in the Sun Valley neighborhood of Los Angeles, would serve as a disposal site for some of the spoils generated by the E2 Build Alternative and the E2A Build Alternative.

8.4.2.9 Socioeconomics and Communities

The Build Alternatives would result in residential and business displacements as a result of the right-of-way acquisition requirements. The SR14A Build Alternative would entail the fewest single-family residential displacements, the E1 Build Alternative would entail the fewest multifamily residential unit displacements, and the E2 Build Alternative would result in the fewest business displacements. However, there is substantial community opposition to the E2 and E2A Build Alternatives, particularly in the Shadow Hills and Lake View Terrace communities where the E2 and E2A Build Alternatives would emerge from tunneling at the southern end of the ANF and span Big Tujunga Wash on an elevated structure. Among other issues, these communities have expressed concerns about noise impacts, residential displacements, and impacts on equestrians resulting from the project. There has also been community opposition to the Refined SR14 Build Alternative in the unincorporated communities of Acton and Agua Dulce where there is concern about residential displacements and noise and vibration impacts. Unlike the Refined SR14 Build Alternatives, the SR14A Build Alternative would not require the construction of at-grade and elevated alignment in the unincorporated community of Acton and would avoid displacing residents. Additionally, in the San Fernando Valley, communities are concerned about residential and business displacements that could take place with construction of either the Refined SR14, SR14A, E1, or E1A Build Alternatives.

8.4.2.10 Parks, Recreation, and Open Space

The E2A Build Alternative would include HSR infrastructure close to the most parks, recreational areas, and open space resources compared to the other Build Alternatives. The E1 Build Alternative would be built near to the fewest parks, recreational areas, and open space resources. Although the total number of resources potentially affected (within 1,000 feet of proposed HSR infrastructure) would differ among the Build Alternatives, the most significant impacts (i.e., direct acquisition of parkland and/or realignments of trails) would occur as a result of the E2A Build Alternative. All six Build Alternatives would affect the following park, recreational, and open space resources:

- Palmdale Hills Trail (proposed extension)
- Littlerock Trail (proposed extension)

In addition to the resources common to all six Build Alternatives, one or both of the Refined SR14 and SR14A Build Alternatives would have a direct impact on the following resources:

- PCT (Pacific Crest Trail) (Refined SR14 Build Alternative only)
- Santa Clara River Trail (proposed extension) (Refined SR14 and SR14A Build Alternatives)
- Rim of the Valley Trail (proposed extension) (Refined SR14 and SR14A Build Alternatives)
- Lang Station Open Space at Bee Canyon (Refined SR14 and SR14A Build Alternatives)

The E1, E1A, E2, and E2A Build Alternatives would result in direct impacts on Vasquez Loop Trail (proposed extension) and Acton Community Trail (proposed extension). The E2 and E2A Build Alternatives would result in direct impacts on the Hansen Dam Open Space.

The direct and indirect impacts on the Hansen Dam Open Space under the E2 and E2A Build Alternatives would represent the largest direct and indirect impacts of the Build Alternatives. The construction of an elevated railway within this open space area would take place only under the E2 and E2A Build Alternative, which makes the Refined SR14, SR14A, E1, and E1A Build Alternatives less impactful with regards to parks, recreational areas, and open space resources.

8.4.2.11 Aesthetics and Visual Quality

In general, during construction a greater and wider variety of visual impacts would occur under the Refined SR14, E2, and E2A Build Alternatives than under the SR14A, E1, and E1A Build

Alternatives. The SR14A, E1, and E1A Build Alternatives would include the greatest extent of tunnels in terms of distance and would thus result in the least visual impact on its surroundings. The Refined SR14, E2, and E2A Build Alternatives, although they too include substantial below-grade portions, would cross various waterways and other scenic natural resources above grade, thereby causing greater changes in visual quality. Although the Refined SR14 Build Alternative would generally be either near existing transportation infrastructure or below ground between Palmdale and Burbank, large-scale overcrossing structures would block views in some relatively rural areas, such as on Red Rover Mine Road (Key Viewpoint [KVP] 1.8) and the PCT (KVP 1.14). Although the project components for the E2 and E2A Build Alternatives would mostly be not visible below ground in tunnels between Palmdale and Burbank, project features near the tunnel portals would contrast with the natural harmony of some views, such as near Lake View Terrace (KVP 1.22) and Big Tujunga Wash (KVP 1.23). Refer to Section 3.16, Aesthetics and Visual Quality for figures depicting the locations of KVPs associated with the Build Alternatives.

8.4.2.12 Cultural Resources

As shown in , the SR14A Build Alternative would impact 11 known archaeological resources, the least following the E1A and E2A Build Alternatives which would both affect nine known archaeological resources. Based on the number of historic properties within the built historic resource study area and the extent of construction and operations impacts, the Refined SR14 and SR14A Build Alternatives would have the least potential for direct and indirect effects on built historic cultural resources compared to the other Build Alternatives, with three built historic resources being affected.

8.4.2.13 Section 4(f) Resources

As discussed in Chapter 4, Final Section 4(f) and Section 6(f) Evaluations, the Authority has completed the following least harm analysis for the project and determined there is no true avoidance alternative that would avoid all Section 4(f) resources within the resource study area for the Palmdale to Burbank Project Section. The SR14A Build Alternative would result in *de minimis* impacts to the fewest park, recreation, and open-space resources (seven), compared to eight park, recreation, and open-space resources under the Refined SR14 Build Alternative; ten park, recreation, and open-space resources under the E1 Build Alternative; ten park, recreation, and open-space resources under the E1A Build Alternative; twelve park, recreation, and open-space resources under the E2 Build Alternative; and twelve park, recreation, and open-space resources under the E2A Build Alternative. Except for the Section 4(f) use at Lang Station Open Space (the Refined SR14 and SR14A Build Alternatives), the impacts to park, recreation, and open-space resources would be *de minimis*.

As discussed in Section 4.7 of this Final EIR/EIS, there are no feasible and prudent alternatives that would avoid a Section 4(f) use in any of the project alternatives. Because the SR14A Build Alternative would result in the least impacts on Section 4(f) resources of the project alternatives, including the least impacts to park, recreation, and open-space resources and least impacts to historic property resources, the SR14A Alternative has the least overall harm.

The Authority has concluded that the Refined SR14 and SR14A Build Alternatives would result in a permanent use at the Lang Station Open Space. The Refined SR14 and SR14A Build Alternatives would require the permanent acquisition of 85.3 acres, including 56.0 acres of permanent footprint that would be fenced off from the public, as well as 29.3 acres that would be permanently inaccessible from the remainder of the property due to the permanent footprint dividing the property. The permanent use of land at the Lang Station Open Space for the acquisition of new right-of-way for the at-grade section would constitute a permanent use because the features and attributes that qualify the resource for protection under Section 4(f) would be diminished with the Refined SR14 and SR14A Build Alternatives. The E1, E1A, E2, and E2A Build Alternatives would not result in a Section 4(f) use of the Lang Station Open Space due to their distance from the resource.

The Refined SR14 Build Alternative would realign a portion of the PCT, and the E1, E1A, E2, and E2A Build Alternatives would include elevated track structures near the historic Blum Ranch and

near the Blum Ranch Farmhouse. The E1, E1A, E2, and E2A Build Alternatives would also entail the placement of a construction staging area just east of the Eagle and Last Chance Mine Road and would require the laying of asphalt over the historic dirt wagon road and could involve temporary (and potentially permanent) utility easements within the road's right-of-way.

The Refined SR14 Build Alternative would require an approximately 400-foot segment of the PCT be used as a construction staging area. Ultimately, the Refined SR14 Build Alternative would impact an approximately 0.7-mile portion of the current alignment of the PCT. This would require the realignment of the PCT prior to construction. The Authority has consulted with the PCT Association, the Bureau of Land Management, and the U.S. Forest Service regarding trail realignment options and has developed a preliminary PCT realignment that would be part of the Refined SR14 Build Alternative. The trail would be realigned and would cross under the HSR alignment perpendicularly to move trail users through this area as expeditiously as possible. This realignment has been designed to minimize air quality, visual, and noise impacts on PCT users, including effects associated with the PCT's current alignment, which is near the State Route 14 freeway for more than 0.5 mile. The PCT would not require realignment for construction of the SR14A Build Alternative because the SR14A Build Alternative alignment would pass underneath the resource in a bored tunnel. The E1, E1A, E2, and E2A Build Alternative alignments would also pass beneath the trail in a bored tunnel, over three miles southeast of where the Refined SR14 and SR14A Build Alternative alignments would cross the PCT.

With implementation of the E1, E1A, E2, and E2A Build Alternatives, the HSR alignment would be visible from the Blum Ranch. The rail viaduct structure would be approximately 1,000 feet south of the historic property. Although the introduction of a new, noticeable visual element would change some views from this historic resource, the resource would retain its ability to convey its historical significance. Given the distance of the HSR alignment from the historic property and the fact that the integrity of the contributing features would not be diminished, the attributes and features that qualify this historic property for protection under Section 4(f) would not be diminished by views of the E1, E1A, E2, and E2A Build Alternatives from this historic property. Therefore, the Authority has concluded that views of the HSR elevated rail structure from the historic Blum Ranch would not constitute a use under Section 4(f).⁵ The Refined SR14 and SR14A Build Alternatives would have no effect on the Blum Ranch because the resource is outside of their respective resource study areas.

The E1, E1A, E2, and E2A Build Alternatives would include construction and operation of an aerial structure (viaduct) south of the Blum Ranch Farmhouse. Although the farmhouse itself is surrounded by tall mature trees, and views from and toward the proposed HSR viaduct and portal location would likely be partly obstructed, the proximity of the aerial structure would substantially detract from the setting of the historic site. These changes would result in an indirect adverse effect as a result of the introduction of visual elements, as documented in the Finding of Effect document. However, the E1, E1A, E2, and E2A Build Alternatives would not result in the removal of, the physical destruction of, or damage to the contributing elements to the historic property. The Refined SR14 and SR14A Build Alternatives would have no effect on the Blum Ranch Farmhouse because the resource is outside of their respective resource study areas.

Implementation of the E1, E1A, E2, and E2A Build Alternatives would entail the placement of a construction staging area east of the Eagle and Last Chance Mine Road. In addition, construction of the E1, E1A, E2, and E2A Build Alternatives would require the laying of asphalt over the historic dirt wagon road and could involve temporary (and potentially permanent) utility easements within the road right-of-way. Assuming that permanent utility easements are required by the E1, E1A, E2, and E2A Build Alternatives, such activities would not diminish the resource's ability to continue to operate as a road. Accordingly, the laying of asphalt and the establishment

⁵ This finding was made in the Finding of Effect (FOE). The FOE document is an internal report that analyzes the potential effects of the Palmdale to Burbank Project Section on historic properties. The State Historic Preservation Officer concurred on September 3, 2021 (Authority 2021).

of a construction staging area would be only temporary activities that would not diminish the resource's character-defining features, including its alignment, width, grade, and surface. Protective measures, such as the placement of geo-fabric prior to laying asphalt, would allow the road to be restored to preconstruction conditions following construction activities. This would avoid adverse effects on this resource. The Refined SR14 and SR14A Build Alternatives would have no effect on the Eagle and Last Chance Mine Road because the resource is outside of their respective resource study areas.

8.5 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 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 Palmdale to Burbank Project Section is the environmentally superior alternative under CEQA. Implementing the California HSR System between Palmdale and Burbank 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.

8.6 Environmentally Preferable Alternative

The environmentally preferable alternative is a National Environmental Policy Act (NEPA) term for the alternative that will promote the national environmental policy as expressed in NEPA Section 101 (42 U.S.C. 4331). 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 Palmdale to Burbank Project Section.

8.7 Least Environmentally Damaging Practicable Alternative

The Authority has worked closely with federal, state, and regional agencies to meet regulatory requirements by refining alternatives to avoid and minimize impacts and, where necessary, to reach agreement on mitigation measures for impacts that cannot be avoided. Among the federal requirements that must be met are those under Section 404 of the Clean Water Act.

To coordinate decision-making, the Authority and FRA entered into a NEPA/Section 404/Section 408 Integration Process Memorandum of Understanding with USACE and USEPA (Authority et al. 2010). The Memorandum of Understanding outlines three major checkpoints in the integration of the NEPA, Section 404 and Section 14 of the Rivers and Harbors Act ("Section 408") processes. Each checkpoint consists of the submittal of a report, including technical data and studies, by the Authority to the USACE and the USEPA for review and consideration prior to issuing a formal written agency response:

- The first of these submittals is Checkpoint A, which sets out the purpose and need for the project. USACE concurred on the purpose and need on December 18, 2014, to satisfy Checkpoint A. USEPA concurred on the Palmdale to Burbank Project Section purpose and need on December 29, 2014 (Authority and FRA 2014c).
- The second submittal is Checkpoint B, which is required to screen and reduce the potential project alternatives to an appropriate range of "reasonable" and "potentially practicable"⁶

⁶ "Practicability" is defined as available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes (40 C.F.R. 230.10(a)(2)).

alternatives using the best available information. On December 16 and 17, 2020, the USEPA and the USACE, respectively, provided letters on the alternatives that the Authority proposed to carry through the Draft EIR/EIS. Both agencies concurred on the range of alternatives to be carried forward in the Palmdale to Burbank Project Section Draft EIR/EIS.

- Finally, Checkpoint C consists of an analysis of information and data, supported by associated technical studies, for consideration by the USACE and the USEPA in determining the preliminary Least Environmentally Damaging Practicable Alternative and providing a formal agency response. The Authority prepared and submitted a Checkpoint C Summary Report to USACE and USEPA for review in July 2023. USEPA and USACE provided written concurrence with the Authority's Palmdale to Burbank Project Section Checkpoint C Summary Report, which determined that the SR14A Build Alternative is the preliminary least environmentally damaging practicable alternative for the Palmdale to Burbank Project Section, on January 9, 2024, and January 5, 2024, respectively.
- Materials prepared for the Checkpoint submittals are available for review at the Authority office in Sacramento and Los Angeles and may be requested from the Authority.