

California High-Speed Rail Authority

Burbank to Los Angeles

Project Section

Draft Mitigation Monitoring and Enforcement Plan

January 2022



The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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1 INTRODUCTION

The California High-Speed Rail Authority (Authority), as the state lead agency and as the federal lead agency pursuant to the National Environmental Policy Act (NEPA) Assignment Memorandum of Understanding (July 23, 2019), prepared a Final Environmental Impact Report/Environmental Impact Statement (Final EIR/EIS) for the Burbank to Los Angeles Project Section of the California High-Speed Rail (HSR) Project. The Final EIR/EIS satisfies the requirements of the California Environmental Quality Act (CEQA) and NEPA and is the basis for the Authority's decision. In its decision, the Authority selected the Preferred Alternative (HSR Build Alternative).

This Mitigation Monitoring and Enforcement Plan (MMEP)¹ has been prepared for the Preferred Alternative. Table 1 of the MMEP describes mitigation measures from the *Burbank to Los Angeles Project Section Final EIR/EIS* (Authority 2021) that would mitigate adverse environmental impacts of the Preferred Alternative. These measures were developed by the Authority in consultation with appropriate agencies, as well as input from the public, to meet the requirements of CEQA and NEPA. The mitigation measures in Table 1 are conditions of approval that the Authority is required to comply with as it implements the Preferred Alternative.

The Preferred Alternative incorporates impact avoidance and minimization measures (IAMF), including best management practices (BMPs) identified in the Final EIR/EIS and described in detail in the technical reports that support the environmental document. As a result of incorporating these IAMFs, the Preferred Alternative will avoid potential adverse environmental impacts in several resource areas, including transportation, air quality and global climate change; public utilities and energy; hydrology and water resources; geology, soils, seismicity, and paleontological resources; hazardous materials and wastes; safety and security; station planning, land use, and development; agricultural farmland and forest land; cultural resources; and regional growth. In addition, the regulatory requirements, including permitting and coordination with regulatory agencies, for many project-related activities provide additional assurance that potential adverse environmental impacts will be avoided or minimized. Four cooperating agencies are part of the NEPA review process: the U.S. Army Corps of Engineers, the Federal Transit Administration, the Surface Transportation Board, and the Federal Aviation Administration. As part of the CEQA process, the responsible agencies include the California Department of Fish and Wildlife, California Department of Transportation, California Public Utilities Commission, California State Lands Commission, State Water Resources Control Board, and the Los Angeles County Flood Control Board. Like the mitigation measures listed in Table 1, the project IAMFs and compliance with regulatory requirements are a condition of project approval and must be implemented by the Authority during design, construction, and operation of the Preferred Alternative. The IAMFs that are part of the Preferred Alternative are listed in Table 2, and they are described in Appendix 2-B, Impact Avoidance and Minimization Features, of the Final EIR/EIS.

The laws and orders the project is subject to are described for the following resource areas in more detail in the corresponding chapters of the Final EIR/EIS.

- Transportation – Section 3.2.2
- Air Quality and Global Climate Change – Section 3.3.2
- Noise and Vibration – Section 3.4.2
- Electromagnetic Fields and Electromagnetic Interference – Section 3.5.2
- Public Utilities and Energy – Section 3.6.2
- Biological and Aquatic Resources– Section 3.7.2
- Hydrology and Water Resources – Section 3.8.2
- Geology, Soils, Seismicity, and Paleontological Resources – Section 3.9.2
- Hazardous Materials and Wastes – Section 3.10.2
- Safety and Security – Section 3.11.2
- Socioeconomics and Communities – Section 3.12.2

¹ The MMEP is consistent with CEQA requirements for mitigation monitoring as set forth in Section 15097 of the CEQA Guidelines (Title 14 California Code of Regulations, Division 6, Chapter 3). Where mitigation is for NEPA purposes only or CEQA purposes only, it is identified accordingly.

- Station Planning, Land Use, and Development – Section 3.13.2
- Agricultural Farmland and Forest Land – Section 3.14.2
- Parks, Recreation, and Open Space – Section 3.15.2
- Aesthetics and Visual Quality – Section 3.16.2
- Cultural Resources – Section 3.17.2
- Regional Growth – Section 3.18.2
- Cumulative Impacts – Section 3.19.2

The MMEP adheres to the Council on Environmental Quality’s (CEQ) regulations (40 Code of Federal Regulations Section 1505²) and Federal Railroad Administration Procedures for Considering Environmental Impacts (64 Federal Register 28545, May 26, 1999) and was prepared based on the CEQ finalized guidance entitled *Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact* (CEQ 2011). The CEQ guidance assists NEPA lead agencies to develop mitigation programs that provide effective documentation, implementation, and monitoring of mitigation commitments.

² The Council on Environmental Quality issued new regulations on July 14, 2020, effective September 14, 2020, updating the NEPA implementing procedures at 40 C.F.R. 1500. However, this project initiated NEPA before the effective date and is not subject to the new regulations, relying on the 1978 regulations as they existed prior to September 14, 2020. All subsequent citations to Council on Environmental Quality regulations in this environmental document refer to the 1978 regulations, pursuant to 40 C.F.R. 1506.13 (2020) and the preamble at 85 Fed. Reg. 43340.

2 MITIGATION MONITORING AND ENFORCEMENT PLAN

The environmental effects of the Preferred Alternative will result in impacts considered significant under CEQA and in impacts under NEPA. Mitigation measures that will reduce or eliminate potential adverse environmental impacts are described in Chapter 3 of Volume 1 of the Final EIR/EIS. The specific provisions contained in this MMEP are presented as tables and include mitigation measures identified in the Final EIR/EIS, organized by environmental issue and topical areas addressed in the Final EIR/EIS. In collaboration with the appropriate agencies, the Authority may refine the means by which it will implement a mitigation measure, as long as the alternative means would ensure compliance during implementation. This MMEP describes implementation and monitoring procedural guidance, responsibilities, and timing for each mitigation measure identified in the Final EIR/EIS. Components include:

- **Impact Number and Impact Text:** Provides the impact number and description of the impact requiring mitigation as identified in the Final EIR/EIS.
- **Mitigation Measures:** Provides the number, title, and text of the mitigation measure as identified in the Final EIR/EIS.
- **Phase:** Provides the phase during which the mitigation measure will be implemented (pre-construction, during construction, post-construction, or during operation).
- **Implementation Action/Text/Mechanism:** Identifies the actions required to implement the measures, including any required agreements and/or conditions.
- **Reporting Schedule:** Not all mitigation actions will take place at the same time. Depending upon the measure, it may be undertaken prior to construction, during construction, or during project operations. Measures may also be undertaken in conjunction with different construction packages or at such time as project operations reach a certain level. This column of the tables identifies the stage of the project during which the mitigation action will be taken and when reporting is to take place, if reporting is required.
- **Implementing Party/Reporting Party:** Identifies the entity that will be responsible for directly implementing the mitigation measures, monitoring, and reporting. Implementation can be the responsibility of the Authority or its Design-Build Contractor (Contractor). Monitoring will generally be the responsibility of the Contractor, with oversight provided by the Authority during construction. Long-term mitigation monitoring responsibilities will be the responsibility of the Authority.

2.1 Roles and Responsibilities

As the lead agency and proponent of this project, the Authority will implement the mitigation measures through its own actions, those of its Contractors, and actions taken in cooperation with other agencies and entities. The Authority is ultimately accountable for the overall administration of the MMEP and for assisting relevant individuals and parties in their oversight and reporting responsibilities. The responsibilities of mitigation implementation, monitoring, and reporting extended to several entities as discussed above; however, the Authority will bear the primary responsibility for verifying that the mitigation measures are implemented. The Authority defines the mitigation measures required for the project. When project work is undertaken by the Authority's contractor, the Contractor shall implement the mitigation measures that are pertinent to their scope of work. The Contractor shall monitor construction activities to ensure that the mitigation measures are properly implemented and accurately report their activity and results to the Authority. The Authority will periodically check the Contractor's activity, reports, and effectiveness of mitigation activities.

- **Authority:** While the Authority retains responsibility for the implementation and reporting on mitigation measures and IAMFs as specified in this MMEP, activities may be carried out by an Authority representative or an Authority-approved contractor. Authority responsibilities may also include certain measures outside of the scope of the Contractor, such as future studies or operations-phase implementation. In addition, oversight of implementation and reporting may be provided by Authority contractor or representatives as lead agency representatives to facilitate regulatory oversight agency coordination and compliance during implementation and reporting.

- **Contractor:** The Contractor (or the environmental team provided by the Contractor) will be responsible for implementing or monitoring mitigation measures and IAMFs as specified in this MMEP.
- **Mitigation Manager:** The Contractor's representative responsible for overseeing their environmental team's implementation and reporting of environmental commitments reports the status of each mitigation measure to Authority in accordance with this MMEP.
- **Biological Monitor(s):** The Contractor-provided Biological Monitor(s) will be approved by and report directly to the Contractor's Biologist. The Project Biological Monitor(s) will be present onsite within a reasonable monitoring distance during all ground-disturbing activities that have the potential to affect biological resources as directed by the Project Biologist and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance.
- **Cultural Resources Compliance Manager/Principal Investigator:** This position must be an Archaeologist who meets relevant Secretary of the Interior qualifications for an archaeologist. The Cultural Resources Compliance Manager/Principal Investigator is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMEP and treatment plans, and coordinating the status of archaeological mitigation with the Authority in accordance with this MMEP, the Authority's Programmatic Agreement with the California SHPO, and the Burbank to Los Angeles Memorandum of Agreement.
- **Cultural Resources Monitor(s):** The Contractor-provided Cultural Resources Monitor(s) will be approved by and report directly to the Cultural Resources Compliance Manager/Principal Investigator. This/these Monitor(s) will be present on site within a reasonable monitoring distance during ground-disturbing activities in areas indicated as culturally sensitive and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance as directed by the Cultural Resources Compliance Manager/Principal Investigator.
- **Paleontological Resources Specialist:** The Contractor-provided Paleontological Resources Specialist is responsible for implementing mitigation measures in compliance with the terms and conditions outlined in the MMEP, including preparation of the Paleontological Resources Management Plan and approval and direction of the Paleontological Resource Monitor(s).
- **Paleontological Resources Monitor(s):** The Contractor-provided Paleontological Resources Monitor(s) will be approved by and report directly to the Paleontological Resources Specialist. The Paleontological Resources Monitor(s) will be present on site within a reasonable monitoring distance during ground-disturbing activities in areas indicated as resource sensitive and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance as directed by the Paleontological Resources Specialist.

3 ENVIRONMENTAL MITIGATION MANAGEMENT APPLICATION SYSTEM

The Authority will implement an Environmental Mitigation Management Application system consisting of strategic planning, policies, and procedures, organizational structure, staffing and responsibilities, milestones, schedule, and resources devoted to achieving the Authority's environmental commitments. The Environmental Mitigation Management Application systems will also include a component that tracks the implementation of mitigation measures (as well as environmental commitments, BMPs, and IAMFs) and can produce reports on compliance. The Authority will receive periodic reports on compliance and may request additional reports as necessary to ensure that the MMEP is fully implemented. This system will rely on data provided by the contractor, regional consultants, and others to produce status reports regarding construction status, permitting activities, monitoring, inspections, and other compliance activities.

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Table 1 Burbank to Los Angeles Project Section Mitigation Monitoring and Enforcement Plan

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Transportation										
TRAN-MM#1	Intersection Improvements for Construction Impacts	<p>The following improvements are available for consideration to address construction-related traffic delay impacts under NEPA for the project. No mitigation is required under CEQA.</p> <ul style="list-style-type: none"> ▪ Sunland Boulevard at San Fernando Road Minor—Change the westbound approach to one left-turn only lane and one through/right lane through restriping. ▪ Sunland Boulevard at San Fernando Road—Provide southbound exclusive left-turn lane with protected phasing. Remove split phasing for northbound and southbound movements. Switch northbound left-turn lane to permissive phasing. Restripe the eastbound approach to add a second eastbound left-turn lane. ▪ Vineland Avenue at Vanowen Street—Restripe eastbound and westbound approaches. ▪ Strathern Street/Clybourn Avenue at San Fernando Road—Restripe eastbound approach and slightly restripe the striped median to provide a second through lane (two through lanes and one shared through-right lane). ▪ Hollywood Way Southbound at San Fernando Road—Modify northbound approach from one left-turn and one right-turn lane to one shared left-right lane and one right-turn lane. ▪ Hollywood Way at Victory Boulevard—Restripe the northbound approach, including removal of the southbound through lane, to provide two right-turn lanes and two left-turn lanes. Increase signal cycle length from 90 to 120 seconds ▪ Buena Vista Street at San Fernando Boulevard—Increase signal cycle length from 90 to 120 seconds and optimize splits. ▪ Buena Vista Street at Thornton Avenue—Restripe the southbound approach, assuming the existing curb lane functions as a right-turn lane at this approach. ▪ Buena Vista Street at Vanowen Street—Change northbound left-turn signal phasing from protected to permissive. ▪ Buena Vista Street at Victory Boulevard—Restripe the eastbound and westbound approaches to provide a second left-turn lane. Add a right-turn overlap for the southbound right-turn movement. The southbound (Burbank Boulevard) approach already has two through lanes and one right-turn lane. ▪ Burbank Boulevard at San Fernando Boulevard—Restripe and re-designate lanes to provide two left-turn lanes in the southbound (Burbank Boulevard) direction, two dedicated right-turn lanes and two through lanes in the westbound 	Pre-construction	Design	Prior to final design	Authority/ Contractor	Authority/ Contractor	Intersection and roadway segment improvements to address traffic delay impacts	MOU with Cities of Burbank and Los Angeles, as necessary/contract with contractor	Impact TR #1: Signalized Intersection Delay Increases during Construction Impact S&S #11: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>(San Fernando Boulevard) direction, and protected-permissive left-turn phasing at the eastbound approach.</p> <ul style="list-style-type: none"> ▪ Burbank Boulevard at Victory Boulevard—Restripe the eastbound (Victory Boulevard) approach to provide two through lanes and one right-turn lane. Restripe the westbound (Victory Boulevard) approach to provide three left-turn lanes and two through lanes. Restripe the northbound (Burbank Boulevard) approach to provide two left-turn lanes and two right-turn lanes. These designations assume that all approach and receiving movements on the north leg (Burbank Boulevard) would be closed off due to construction. Increase the signal cycle length to 120 seconds. ▪ Magnolia Boulevard at 1st Street—Restripe the westbound (1st Street) approach to provide two left-turn lanes, two through lanes, and one shared through-right lane. Restripe the eastbound (1st street) approach by decreasing the width of the two receiving lanes to provide a second right-turn lane. Increase the signal cycle length to 120 seconds. ▪ Magnolia Boulevard at Victory Boulevard—Restripe the eastbound approach (by narrowing the receiving lane widths), changing the right-turn lane to a shared through-right lane, and removing an exclusive through lane and adding a second left-turn lane. Restripe the northbound approach to provide a dual left-turn lane, one through lane, and a shared through-right lane. Increase the signal cycle length from 90 to 120 seconds. ▪ Olive Avenue at 1st Street—The westbound (1st Street) and northbound (Olive Avenue) approaches leave sufficient room for the existing curb lanes to act as right-turn lanes. Maintain a right-turn overlap phase on the eastbound approach (1st Street) as in the existing condition. Add right-turn overlap phases on the westbound (1st Street), southbound (Olive Avenue), and reconfigured northbound approaches. ▪ Olive Avenue at Victory Boulevard—Restripe the eastbound (Victory Boulevard) approach to convert one of the through lanes to a left-turn lane with lead-lag phasing and to convert the right-turn lane to a shared through-right lane. Restripe the westbound (Victory Boulevard) approach to convert the right-turn lane to a shared through-right lane. Implement a right-turn overlap phase on the southbound (Olive Avenue) approaches. Increase the signal cycle length to 120 seconds. ▪ San Fernando Road at Chevy Chase Drive—Change the westbound through/right-turn lane to a right-only lane, add one westbound right-turn only lane, change the eastbound left-turn lane and the westbound left-turn lane to protected phasing, and add westbound right-turn overlap phase. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> Hollywood Way at I-5 Southbound Ramps—Signalize the intersection. Sotello Street at Main Street—Signalize the intersection. 								
TRAN-MM#2	Intersection Improvements for Operational Impacts	<p>The following improvements are available for consideration to address operation-related traffic delay impacts under NEPA for the 2029 opening year. No mitigation is required under CEQA.</p> <ul style="list-style-type: none"> Sunland Boulevard at San Fernando Road Minor—Widen westbound approach from westbound left-turn through lane and westbound right-turn pocket to westbound left-turn and westbound right through lanes. Optimize cycle length and splits. Sunland Boulevard at San Fernando Road—Provide exclusive southbound lane with protected-permitted phasing and westbound right-turn lane with overlap phasing. Provide protected-permitted phasing for northbound left-turn lane. Optimize cycle length and splits. Hollywood Way at I-5 Southbound Ramps—Signalize the intersection. SR 170 Southbound Ramp at Victory Boulevard—Signalize the intersection, provide northbound and southbound right-turn protected phasing. Hollywood Way at Cohasset Street E—Signalize the intersection. Broadway at Cesar E. Chavez Avenue—Add one southbound left-turn lane; no widening but some parking would be removed. Garey Street – US-101 Southbound On-/Off-Ramps at Commercial Street—Change westbound through/right-turn lane to a right-turn only lane; add one westbound right-turn only lane. US-101 Northbound Off-Ramp at 4th Street—Add one northbound left-turn lane. Sotello Street at Main Street—Signalize the intersection. Center Street at Commercial Street—Signalize the intersection. The signalized intersections listed below would meet the impact thresholds by 2040, but the impact thresholds may or may not be met at earlier dates. The following improvements are available for consideration to address operation-related traffic delay impacts under NEPA that could occur when the delay and LOS reach a level where the impact thresholds are exceeded (between 2029 and 2040). No mitigation is required under CEQA. State Street at Marengo Street—Add one westbound turn lane and remove parking. 	Pre-construction	Design	Prior to final design	Authority/ Contractor	Authority/ Contractor	Intersection and roadway segment improvements to address traffic delay impacts	MOU with Cities of Burbank and Los Angeles, as necessary/ contract with contractor	Impact TR #7: Signalized Intersection Delay Increases during Operation Impact S&S #11: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> Hollywood Way at Thornton Avenue—Optimize cycle length and splits. Grand Avenue at Cesar E. Chavez Avenue—Change the eastbound right-turn only lane to a through/right-turn lane, add one receiving lane on Cesar E. Chavez, remove parking, and restripe. Figueroa Street at Temple Street—Change the southbound right-turn only lane to a through/right-turn lane, and restripe the ramp south of the intersection to provide two receiving lanes. <p>The unsignalized intersections listed below would meet the traffic signal warrants by the year 2040, but the warrant criteria may or may not be met at earlier dates. The following improvements are available for consideration to address operation-related traffic delay impacts under NEPA that could occur when the warrant is met (between 2029 and 2040). No mitigation is required under CEQA.</p> <ul style="list-style-type: none"> Main Street at College Street—Signalize the intersection. Elmyra Street at Main Street—Signalize the intersection. Alameda Street at Main Street-Ord Street—Signalize the intersection. Pleasant Avenue at I-10 eastbound on-/off-ramps/Kearny Street—Signalize the intersection. 								
Air Quality and Global Climate Change										
AQ-MM#1	Offset Project Construction Emissions through an SCAQMD Emission Offsets Programs	The project's construction emissions that cannot be reduced by IAMFs and any other mitigation measures would be offset through a South Coast Air Quality Management District (SCAQMD) rule or contractual agreement by funding equivalent emissions reductions that achieve reductions in the same years as construction emissions occur, thus offsetting project-related air quality impacts in real time. The project will implement measures and best practices to minimize emissions from project construction. After implementation of these measures, emission levels that still exceed General Conformity de minimis thresholds will be offset to net zero as measured in tons per year.	Construction	Reporting/funding	Yearly	Authority/Contractor	Authority/Contractor	Offset project construction criteria air pollutant emissions through funding	Authority to coordinate purchase of offsets with SCAQMD per contractor reports	Impact AQ #1: Regional Air Quality Impacts during Construction Impact AQ #2: Compliance with Air Quality Plans Impact AQ #5: Localized Air Quality Impacts during Construction of Rail Alignment and Train Stations Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction Cumulative Construction Impacts

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
AQ-MM#2	Construction Emissions Reduction - Requirements for use of Zero Emission(ZE) and/or Near Zero Emission(NZE) Vehicles and Off-Road Equipment	<p>This mitigation measure would reduce the impact of construction emissions from project-related on-road vehicles and off-road equipment. All remaining emissions after implementation of this measure would be offset with emission credits required under Mitigation Measure AQ-MM#1.</p> <p>The Authority and all project construction contractors will require that a minimum of 25 percent, with a goal of 100 percent, of all <u>light-duty</u> on-road vehicles (e.g., passenger cars, light-duty trucks) associated with the project (e.g., on-site vehicles, contractor vehicles) use zero-emission (ZE) or near-zero emission (NZE) technology.</p> <p>The Authority and all project construction contractors will have the goal that a minimum of 25 percent of all <u>heavy-duty</u> on-road vehicles (e.g., for hauling, material delivery and soil import/export) associated with the project use ZE or NZE technology.</p> <p>The Authority and all project construction contractors will have the goal that a minimum of 10 percent of <u>off-road</u> construction equipment use ZE or NZE vehicles.</p> <p>If local or state regulations mandate a faster transition to using ZE and/or NZE vehicles at the time of construction, the more stringent regulations will be applied. For example, Executive Order (EO) N-79-20, issued by California Governor Newsom on September 23, 2020, currently states the following:</p> <ul style="list-style-type: none"> • Light duty and passenger car sales be 100 percent ZEV by 2035 • Full transition to ZEV short haul/drayage trucks by 2035 • Full transition to ZEV heavy-duty long-haul trucks, where feasible, by 2045 • Full transition to ZE off-road equipment by 2035, where feasible. <p>The project will have a goal of surpassing the requirements of these or other future regulations as a mitigation measure.</p>	Construction	Monitoring/reporting	Yearly	Authority/ Contractor	Authority/ Contractor	Offset construction emissions with Zero Emission and/or Near Zero Emission Vehicles and Off-Road Equipment	Contract requirements and specifications	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #2: Compliance with Air Quality Plans</p> <p>Impact AQ #5: Localized Air Quality Impacts during Construction of Rail Alignment and Train Stations</p> <p>Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction</p>

Noise and Vibration

N&V-MM#1	Construction Noise Mitigation Measures	<p>Prior to construction (any ground-disturbing activities), the contractor shall prepare a noise-monitoring program for Authority approval. The noise-monitoring program shall describe how during construction the contractor will monitor construction noise to verify compliance with the noise limits (An 8-hour Leq, dBA of 80 during the day and 70 at night for residential land use, 85 for both day and night for commercial land use, and 90 for both day and night for industrial land use). The contractor would be given</p>	Pre-construction/ construction	Design/yearly reporting	Prior to construction/ weekly monitoring and yearly reporting	Authority/ Contractor	Contractor	Placement of sound barriers and construction equipment to mitigate construction noise and weekly	Contract requirements and specifications	Impact N&V #1: Temporary Exposure of Sensitive Receivers to Construction Noise
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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>the flexibility to meet the FRA construction noise limits in the most efficient and cost-effective manner. This can be done by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. In addition, the noise-monitoring program will describe the actions required of the contractor to meet required noise limits. These actions will include the following nighttime and daytime noise control mitigation measures, as necessary:</p> <ul style="list-style-type: none"> ▪ Install a temporary construction site sound barrier near a noise source. ▪ Avoid nighttime construction in residential neighborhoods. ▪ Locate stationary construction equipment as far as possible from noise-sensitive sites. ▪ Reroute construction truck traffic along roadways that will cause the least disturbance to residents. ▪ During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters. ▪ Use low-noise-emission equipment. ▪ Implement noise-deadening measures for truck loading and operations. ▪ Monitor and maintain equipment to meet noise limits. ▪ Line or cover storage bins, conveyors, and chutes with sound-deadening material. ▪ Use acoustic enclosures, shields, or shrouds for equipment and facilities. ▪ Use high-grade engine exhaust silencers and engine-casing sound insulation. ▪ Prohibit aboveground jackhammering and impact pile driving during nighttime hours. ▪ Minimize the use of generators to power equipment. ▪ Limit use of public address systems. ▪ Grade surface irregularities on construction sites. ▪ Use moveable sound barriers at the source of the construction activity. ▪ Limit or avoid certain noisy activities during nighttime hours. ▪ To mitigate noise related to pile driving, the use of an auger to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur. ▪ The Authority will establish and maintain in operation until completion of construction a toll-free "hotline" regarding the HSR Build Alternative construction activities. The Authority 						monitoring construction noise		

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>shall arrange for all incoming messages to be logged (with summaries of the contents of each message) and for a designated Authority representative to respond to hotline messages within 24 hours (excluding weekends and holidays). The Authority shall make a reasonable good-faith effort to address all concerns and answer all questions, and shall include on the log its responses to all callers. The Authority shall make the log of the incoming messages and the Authority's responsive actions publicly available on its website.</p> <p>The contractor shall provide the Authority with an annual report by January 31 of the following year documenting how it implemented the noise-monitoring program.</p>								
N&V-MM#2	Construction Vibration Mitigation Measures	<p>Prior to construction involving impact pile driving within 80 feet of any building, the contractor shall provide the Authority with a vibration technical memorandum documenting how project pile driving criteria will be met. Upon approval of the technical memorandum by the Authority, and where a noise-sensitive receiver is present, the contractor shall comply with the vibration reduction methods described in that memorandum. Potential construction vibration building damage is only anticipated from impact pile driving at very close distances from buildings. If pile driving occurs more than 25 to 50 feet from buildings, or if alternative methods such as push piling or auger piling are used, damage from construction vibration is not expected to occur. When a construction scenario has been established, pre-construction surveys will be conducted by the contractor at locations within 50 feet of pile driving to document the existing condition of buildings in case damage is reported during or after construction. The contractor will arrange for the repair of damaged buildings or will pay compensation to the property owner.</p>	Pre-construction/ construction/ post-construction	Reporting/ funding	Pre-construction surveys to establish baseline/ weekly monitoring during construction/ post-construction repairs, as needed	Authority/ Contractor	Authority/ Contractor	Pre-construction surveys to establish baseline/ ongoing weekly monitoring during construction/ post-construction assessments and repairs building damage as needed	Contract requirements and specifications	Impact N&V #2: Temporary Exposure of Sensitive Receivers to Construction Vibration
N&V-MM#3	Implement California High-Speed Rail Project Noise Mitigation Guidelines	<p>The Authority has developed Noise Mitigation Guidelines for the statewide HSR system that sets forth three categories of mitigation measures to reduce or offset severe noise impacts from HSR operations: sound barriers, sound insulation, and noise easements. The Guidelines also set forth an implementation approach that considers multiple factors for determining the reasonableness of sound barriers as mitigation for severe noise impacts, including structural and seismic safety, cost, number of affected receptors, and effectiveness. Sound barrier mitigation would be designed to reduce the noise level from HSR operations from severe to moderate according to the provisions of the FRA (FRA 2012).</p> <p>Sound Barriers</p> <p>Prior to operation of the HSR project, the Authority will install sound barriers where they can achieve between 5 and 15 decibels (dB) of noise reduction, depending on their height and</p>	Pre-construction/ post-construction	Design	Prior to final design/ prior to operation/ monthly reporting during operation	Authority/ Contractor	Authority/ Contractor	Implement sound barriers as needed or acquire easements on properties severely affected by noise	Contract requirements and specifications/ California High-Speed Rail Project Noise Mitigation Guidelines	Impact N&V #4: Project Noise Impacts

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>location relative to the tracks. The primary requirements for an effective sound barrier are that the barrier must: (1) be high enough and long enough to break the line of sight between the sound source and the receiver; (2) be of an impervious material with a minimum surface density of 4 pounds per square foot; and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers. Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barrier's style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses (refer to Aesthetic Options for Non-Station Structures [Authority 2017b]). For example, sound barriers could be solid or transparent, and made of various colors, materials, and surface treatments.</p> <p>Recommended sound barriers must meet the following criteria:</p> <ul style="list-style-type: none"> ▪ Achieve a minimum of 5 decibels (dB) of noise reduction. ▪ The minimum number of affected sites should be at least 10. ▪ The length should be at least 800 feet. ▪ Must be cost-effective, defined as mitigation not exceeding \$95,000 per benefited receptor. <p>The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers would be designed to be as low as possible to achieve a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit. On aerial structures, the maximum sound barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure will still be designed to be as low as possible to achieve a substantial noise reduction. Sound barriers on both aerial structures and at-grade structures could consist of solid, semitransparent, or transparent materials as defined in the Aesthetic Options for Non-Station Structures (Authority 2017b).</p>								

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		<p>Table 3.4-21 [of the Final EIR/EIS] shows the reasonableness of each feasible sound barrier along with its height, approximate length, number of benefited receivers, total construction cost, number of unmitigated severe impacts, and number of residual impacts (with mitigation). Consistent with Caltrans guidelines, sound barriers were determined to be feasible because the barrier is capable of providing a noise level reduction of 5 dBA or more, and sound barriers were determined to be reasonable because the cost to construct the barrier would not exceed the cost allowance per benefited receiver approved by the Authority. Figure 3.4 10 shows the sound barrier locations. Table 3.4 22 [of the Final EIR/EIS] shows the residual severe impacts based on each land use in each category that were not evaluated with a sound barrier because they are in areas that do not meet the minimum number of 10 severely impacted receivers and the minimum barrier length of 800 feet.</p> <p>Building Sound Insulation</p> <p>If sound barriers are not proposed for receptors with severe impacts, or if proposed sound barriers do not reduce sound levels to below a severe impact level, the Authority will consider building sound insulation as a potential additional mitigation measure on a case-by-case basis. Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a mitigation measure that can be provided when the use of sound barriers is not feasible in providing a reasonable level (5 to 7 dB) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dB) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened. The considered sound insulation would also be required to provide a reduction of at least 5 dBA.</p> <p>Noise Easements</p> <p>If a substantial noise reduction cannot be achieved through installation of sound barriers or building sound insulation, the Authority will consider acquiring a noise easement on properties with a severe impact on a case-by-case basis. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly. If all mitigation efforts are found to be not effective or reasonable and feasible, property acquisitions may occur.</p>								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
N&V-MM#4	Vehicle Noise Specification	In the procurement of an HSR vehicle technology, the Authority will request bidders to provide information regarding technology development, if any, that might allow trainsets to be procured that would be more quiet than the European Technical Specification for Interoperability Standard. The analysis in this EIR/EIS does not assume for its quantitative calculations of post-mitigation impacts that trainsets will be able to comply with the USEPA standard (40 C.F.R. Part 201.12/13), if applicable, cited earlier in this chapter, due to lack of currently available compliant technology.	Post-construction	HSR vehicle purchasing	HSR operation	Authority	Authority	HSR vehicle noise specification	Contract requirements and specifications	Impact N&V #4: Project Noise Impacts Impact N&V #5: Vibration Impacts from Project Operation
N&V-MM#5	Special Trackwork	Prior to construction, the contractor shall provide the Authority with an HSR operation noise technical report for review and approval. The report shall address the minimization/elimination of rail gaps at turnouts. Because the impacts of HSR wheels over rail gaps at turnouts increases HSR noise by approximately 6 dB over typical operations, turnouts can be a major source of noise impact. If the turnouts cannot be moved from sensitive areas, the noise technical report will recommend the use special types of trackwork that eliminate the gap. The Authority will require the project design to follow the recommendations in the approved noise impact report.	Pre-construction	Design	Prior to construction	Authority/ Contractor	Authority/ Contractor	Provide operation noise technical report to determine if special trackwork is required	Contract requirements and specifications	Impact N&V #4: Project Noise Impacts Impact N&V #5: Vibration Impacts from Project Operation
N&V-MM#6	Additional Noise and Vibration Analysis Following Final Design	Prior to construction, the contractor shall provide the Authority with an HSR operation noise technical report for review and approval. If final design or final vehicle specifications result in changes to the assumptions underlying the noise technical report, the Authority shall prepare necessary environmental documentation, as required by CEQA and NEPA, to reassess noise impacts and mitigation. Table 3.4-23 [of the Final EIR/EIS] shows potential vibration mitigation procedures.	Pre-construction	Design	Prior to construction/ final vehicle specification	Authority (vehicle)/ Contractor	Authority (vehicle)/ Contractor	Reassessment of noise and vibration impacts and recommended mitigation following final design	Submit assessment and supplemental environmental documentation	Impact N&V #4: Project Noise Impacts Impact N&V #5: Vibration Impacts from Project Operation
Electromagnetic Interference and Electromagnetic Fields										
EMI/EMF-MM#1	Protect Sensitive Equipment	The Authority would contact entities where sensitive equipment is located to evaluate the potential impacts of both HSR project-related EMF RF and low-frequency EMI on medical equipment before completion of final design. Where necessary to avoid interference, the final design would include suitable design provisions, which may include establishing magnetic field shielding walls around sensitive equipment or installing RF filters into sensitive equipment. HSR-related EMI may affect highly susceptible, unshielded sensitive RF equipment, such as older MRI systems and other measuring devices common to medical and research laboratories. Most of the devices manufactured today have adequate shielding from all potential EMI sources; however, the potential exists for older devices to be affected and require shielding. A shielded enclosure is very effective at preventing external EMI. Metallic materials are used for shielding (specifically high-	Pre-construction	Design	Prior to completion of final design	Authority/ Contractor	Authority/ Contractor	Protect nearby equipment sensitive to EMF/EMI	Contract requirements and specifications	Impact EMI/EMF #1: Temporary Impacts from Use of Heavy Construction Equipment Impact EMI/EMF #3: Temporary Impacts from Operation of Electrical Equipment Impact EMI/EMF #6: Interference with Sensitive Equipment

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>conductivity metals for high-frequency interference, such as from HSR operation), and high-permeability metals are used for low-frequency interference. Often either the housing of the affected device is coated with a conductive layer or the housing itself is made conductive. In some situations, it may be necessary to significantly reduce EMI for a suite of devices by creating a shielded room or rooms.</p> <p>Attenuation (i.e., the effectiveness of EMI shielding) is the difference between an electromagnetic signal's intensity before and after shielding. Attenuation is the ratio between field strength with and without the presence of a protective medium, measured in decibels. This decibel range changes on a logarithmic scale, so an attenuation rating of 50 decibels indicates a shielding strength 10 times that of 40 decibels. In general, a shielding range between 60 and 90 decibels may be considered a high level of protection, while 90 to 120 decibels is exceptional.</p>								
Public Utilities and Energy										
PUE-MM#1	Water Supply Analysis for Construction	<p>The Authority would prepare an updated water supply analysis for the HSR Build alternative that identifies the detailed water supply needs for the construction of the Burbank to Los Angeles Project Section. While the Burbank to Los Angeles Section includes connections to the water supply infrastructure in the area, the project may not rely entirely on the existing and planned local water supply allocations, particularly in the event of a dry year.</p> <p>Based on the results of the water supply analysis, the Authority will coordinate with the water agencies to determine if allocations for additional water supply are needed for project construction. In the event that additional water supply is needed from the local groundwater or the State Water Project, the Authority shall pay the water agencies its fair share of the State Water Project fees (per acre-foot of their allocations), which are used for constructing the State Water Project conservation facilities.</p> <p>In addition, the Authority's contractor will be required to use best management practices during construction to reduce the need for water. These efforts will include using non-potable water during construction, to the extent feasible. Water used for tunnel construction and water coming out of tunnel construction areas will be recycled/reused for construction purposes and will be treated to reduce turbidity. This water used during construction for lubrication and cooling purposes would be used several times, thus reducing demand from municipal water sources.</p>	Pre-construction	Design	Prior to final Design	Authority/ Contractor	Authority/ Contractor	Conduct water supply analysis for construction of the HSR Build Alternative	Contract requirements and specifications	Impact PU&E #4: Effects from Water Demand during Construction
PUE-MM#2	Water Demand Analysis for LADWP Supplies at LAUS for Operation	<p>The Authority would prepare an updated water demand analysis in coordination with LADWP for the HSR Build Alternative that identifies the detailed water supply needs for the operation of the Burbank to Los Angeles Project Section at LAUS. This would be consistent with California Water Code Sections 10910-10915, which requires water supply planning. While the Burbank to Los</p>	Pre-construction	Design	Prior to final Design	Authority/ Contractor	Authority/ Contractor	Conduct water supply analysis for operation of the HSR Build Alternative	Contract requirements and specifications	Impact PU&E #11: Operational Water Demand

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>Angeles Section includes connections to the water supply infrastructure in the area, the project may not rely entirely on the existing and planned local water supply allocations, particularly in the event of a dry year.</p> <p>Based on the results of the water demand analysis, the Authority will coordinate with LADWP to determine if allocations for additional water supply are needed for project operation at LAUS. In the event that additional water supply is needed from the local groundwater or the State Water Project, the Authority shall pay LADWP its fair share of the State Water Project fees (per acre-foot of their allocations), which are used for constructing and operating the State Water Project conservation facilities.</p>								
Biological and Aquatic Resources										
BIO-MM#1	Conduct Presence/Absence Pre-construction Surveys for Special-Status Plant Species and Special-Status Plant Communities	Prior to any ground-disturbing activity, the project biologist will conduct presence/absence botanical field surveys for special-status plant species and special-status plant sensitive natural communities in all potentially suitable habitats within a Work Area. The surveys shall be consistent with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018) and Guidelines for Conducting and Report Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 2001). The project biologist will flag and record in GIS the locations of any observed special-status plant species and special-status plant sensitive natural communities.	Pre-construction	Surveying/ monitoring/ reporting	Report findings at least 30 days prior to ground disturbance	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct protocol-level surveys for special-status plant species and communities/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Effects on Special-Status Plant Species
BIO-MM#2	Prepare and Implement Plan for Salvage and Relocation of Special-Status Plant Species	<p>Prior to any ground-disturbing activity, the project biologist will collect seeds and plant materials and stockpile and segregate the top 4 inches of topsoil from locations within the work area where species listed as threatened or endangered under the FESA, threatened, endangered, or candidate for listing under CESA, state-designated "Rare" species, and California Rare Plant Rank 1B and 2 species were observed during surveys for use on off-site locations. Suitable sites to receive salvaged material include Authority mitigation sites, refuges, reserves, federal or state lands, and public/private mitigation banks.</p> <p>If relocation or propagation is required by authorizations issued under the FESA and/or CESA, the project biologist will prepare a plant species salvage plan to address monitoring, salvage, relocation, and/or seed banking of federal or state-listed plant species</p> <p>The plan will include provisions that address the techniques, locations, and procedures required for the collection, storage, and relocation of seed or plant material, and collection, stockpiling, and redistribution of topsoil and associated seed. The plan will also include requirements related to outcomes such as percentage of absolute cover of highly invasive species, as defined by the California Invasive Plant Council (less than</p>	Pre-construction/ construction/ post-construction	Surveying/ monitoring/ reporting	In accordance with agency permit requirements	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement monitoring, salvage, relocation, and propagation of special-status plant species/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #1: Construction Effects on Special-Status Plant Species

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		documented baseline conditions), maintenance, monitoring, implementation, and the annual reporting. The plan will reflect conditions required under regulatory authorizations issued for federal or state-listed species. The project biologist will submit the plan to the Authority for review and approval.								
BIO-MM#14	Conduct Pre-construction Surveys and Delineate Active Nest Exclusion Areas for Breeding Birds	Prior to any ground-disturbing activity, including vegetation removal, scheduled to occur during the bird breeding season (February 1 to September 1), the project biologist will conduct visual pre-construction surveys within the work area for nesting birds and active nests (nests with eggs or young) of nonraptor species listed under the MBTA or the Fish and Game Code. In the event that active bird nests are observed during the pre-construction survey, the project biologist will delineate no-work buffers. No-work buffers will be set at a distance of 75 feet, unless a larger buffer is required pursuant to regulatory authorizations issued under the FESA and/or CESA. No-work buffers will be maintained until nestlings have fledged and are no longer reliant on the nest or parental care for survival or the project biologist determines that the nest has been abandoned. In circumstances where it is not feasible to maintain the standard no-work buffer, the no-work buffer may be reduced, provided that the project biologist monitors the active nest during the construction activity to ensure that the nesting birds do not become agitated. Additional measures that may be used when no-work buffers are reduced include visual screens and sound barriers.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Visual pre-construction surveys in suitable habitats for nesting birds/ establish no-work buffers/ monitor active bird nests/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #8: Operations Effects on Special-Status Wildlife (nesting birds and roosting bats)
BIO-MM#15	Conduct Pre-construction Surveys and Monitoring for Raptors	If construction or other vegetation removal activities are scheduled to occur during the breeding season for raptors (January 1 to September 1), no more than 14 days before the start of the activities, the project biologist will conduct pre-construction surveys for nesting raptors in areas where suitable habitat is present. Specifically, such surveys will be conducted in habitat areas within the project footprint and, where access is available, within 500 feet of the boundary of the project footprint. If breeding raptors with active nests are found, the project biologist will delineate a 500-foot buffer (or as modified by regulatory authorizations for species listed under the FESA and/or CESA) around the nest to be maintained until the young have fledged from the nest and are no longer reliant on the nest or parental care for survival or until such time as the project biologist determines that the nest has been abandoned. Nest buffers may be adjusted if the project biologist determines that smaller buffers would be sufficient to avoid impacts on nesting raptors.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction surveys in suitable habitats for nesting raptors/ establish no-work buffers/ monitor active raptor nests/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #8: Operations Effects on Special-Status Wildlife (nesting birds and roosting bats)
BIO-MM#25	Conduct Pre-construction Surveys for Special-Status Bat Species	No earlier than 30 days prior to the start of ground-disturbing activities in a work area, the project biologist will conduct a visual and acoustic survey (over the course of 1 day and 1 evening at a minimum) for roosting bats in the work area and extending 500 feet from the boundary of the work area, where access is	Pre-construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct visual and acoustic pre-construction survey for roosting bats/	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #8: Operations Effects on Special-Status Wildlife (nesting birds

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		available. Such surveys will be conducted only in those areas in which bridges, abandoned structures, culverts, trees with large cavities, or dense foliage are present within a half mile of the boundary of the work area.						report findings		and roosting bats)
BIO-MM#26	Implement Bat Avoidance and Relocation Measures	Prior to any ground-disturbing activity, the project biologist shall survey for active hibernacula or maternity roosts. If active hibernacula or maternity roosts are identified in the work area or 500 feet extending from the work area during pre-construction surveys, they will be avoided to the extent feasible. If avoidance of hibernacula is not feasible, the project biologist will prepare a relocation plan to remove the hibernacula and provide for construction of an alternative bat roost outside of the work area with CDFW guidance. Compensation would include the installation of nearby suitable alternative roosting structures if displacements are long-term or permanent. The alternative roosting structure, if required, would be constructed in accordance with CDFW guidance and would be designed to be comparable in size and quality to the impacted habitat. The project biologist will implement the relocation plan before the commencement of any ground-disturbing activities that will occur within 500 feet of the hibernacula. Removal of roosts will be guided by accepted exclusion and deterrent techniques.	Pre-construction/ Construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Avoid active or hibernation roosts, if feasible/ if necessary, prepare and implement relocation plan for bat roosts/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #8: Operations Effects on Special-Status Wildlife (nesting birds and roosting bats)
BIO-MM#27	Implement Bat Exclusion and Deterrence Measures	If nonbreeding or nonhibernating individuals or groups of bats are found roosting within the work area, the project biologist will facilitate the eviction of the bats by either opening the roosting area to change the lighting and airflow conditions or installing one-way doors or other appropriate methods. To the extent feasible, the Authority will leave the roost undisturbed by project activities for a minimum of 1 week after implementing exclusion and/or eviction activities. Steps will not be taken to evict bats from active maternity or hibernacula; instead such features may be relocated pursuant to a relocation plan.	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Safely evict bats from roosts except for established maternity roosts and occupied hibernation roosts/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #8: Operations Effects on Special-Status Wildlife (nesting birds and roosting bats)
BIO-MM#34	Monitor Construction Activities within Aquatic Resources	The project biologist will monitor construction activities that occur within or adjacent to aquatic resources, including activities associated with the installation of protective barriers (e.g., silt fencing, sandbags, fencing), installation and/or removal of creek material to accommodate crossings, construction of access roads, and removal of vegetation. As part of this effort, the project biologist will document compliance with applicable avoidance and minimization measures, including measures set forth in applicable regulatory authorizations issued under the California Fish and Game Code, CWA, and/or the Porter-Cologne Water Quality Control Act.	Construction/ post-construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct monitoring of construction activities in and adjacent to jurisdictional waters/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #10: Operations Effects on Wetlands and Other Aquatic Resources

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
BIO-MM#35	Implement Transplantation and Compensatory Mitigation Measures for Protected Trees	<p>Prior to ground-disturbing activities, the project biologist will conduct surveys in the work area to identify protected trees. The project biologist will establish environmentally sensitive areas (ESA) around protected trees with the potential to be affected by construction activities, but that do not require removal. The ESAs will extend outward 5 feet from the drip lines of such protected trees.</p> <p>The Authority will provide compensatory mitigation for impacts on protected trees, including impacts associated with removing or trimming a protected tree. Compensation will be based on requirements set out in applicable local government ordinances, policies, and regulations. Compensatory mitigation may include, but is not limited to, the following:</p> <ul style="list-style-type: none"> ▪ Transplantation of protected trees to areas outside of the work area ▪ Replacement of protected trees at an offsite location, based on the number of protected trees affected, at a ratio not to exceed 3:1 for native trees or 1:1 for ornamental trees, unless higher ratios are required by local government ordinances or regulations ▪ Contribution to a tree-planting fund 	Pre-construction/ construction/ post-construction	Surveying/ monitoring/ restoration/ reporting	Monthly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Conduct protected trees surveys/ compensate for impacts and effects to protected tree resources/ prepare and implement a monitoring and maintenance program to monitor transplanted trees/ report findings	Condition of design-build contract	Impact BIO #6: Construction Effects on Protected Trees
BIO-MM#37	Minimize Effects to Wildlife Movement Corridors during Construction	To the extent feasible, the Authority will avoid placing fencing, either temporarily or permanently, within known wildlife movement corridors in those portions of the alignment where the tracks are elevated (e.g., viaducts, bridges). The Authority will avoid conducting ground-disturbing activities in wildlife movement corridors during nighttime hours, to the extent feasible, and will shield nighttime lighting to avoid illuminating wildlife movement corridors in circumstances where avoidance of such activities is not feasible.	Pre-construction/ construction	Final design/ surveying/ monitoring/ reporting	Yearly or at other appropriate intervals	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Avoid placement of fencing adjacent to wildlife movement corridors/report findings	Condition of Design-Build Contract Construction	Impact BIO #5: Construction Effects on Wildlife Movement
BIO-MM#47	Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts on Aquatic Resources	<p>The Authority will prepare and implement a Compensatory Mitigation Plan (CMP) that identifies mitigation to address temporary and permanent loss, including functions and values, of aquatic resources as defined as waters of the U.S. under the federal Clean Water Act (CWA) and/or waters of the state under the Porter-Cologne Act. Compensatory mitigation may involve the restoration, establishment, enhancement, and/or preservation of aquatic resources through one or more of the following methods:</p> <ul style="list-style-type: none"> ▪ Purchase of credits from an agency-approved mitigation bank. ▪ Preservation of aquatic resources through acquisition of property. ▪ Establishment, restoration, or enhancement of aquatic resources. 	Pre-construction/ construction/ post-construction	Design/ final design/ surveying/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement CMP for temporary and permanent impact on aquatic resources/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO#4: Construction Effects on Wetlands and Other Aquatic Resources

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		<ul style="list-style-type: none"> In lieu fee contribution determined through consultation with the applicable regulatory agencies. <p>The following ratios will be used for compensatory mitigation unless a higher ratio is required pursuant to regulatory authorizations issued under Section 404 of the CWA and/or the Porter-Cologne Act:</p> <ul style="list-style-type: none"> Vernal pools: 2:1. Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type, function and values lost. 1:1 offsite for permanent impacts. 1:1 onsite and 0.1:1 to 0.5:1 offsite for temporary impacts. <p>For mitigation involving establishment, restoration, enhancement, or preservation of aquatic resources by the Authority, the CMP will contain the following information:</p> <ul style="list-style-type: none"> Objectives. A description of the resource types and amounts that will be provided, the type of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions of the compensatory mitigation project will address the needs of the watershed or ecoregion. Site selection. A description of the factors considered during the term sustainability of the resource. Adaptive management plan. A management strategy to address changes in site conditions or other components of the compensatory mitigation project. Financial assurances. A description of financial assurances that will be provided to ensure that the compensatory mitigation will be successful. <p>In circumstances where the Authority intends to fulfill compensatory mitigation obligations by securing credits from approved mitigation banks or in-lieu fee programs, the CMP need only include the name of the specific mitigation bank or in-lieu fee program to be used and the method for calculating credits.</p>								
BIO-MM#55	Prepare and Implement a Weed Control Plan	<p>Prior to any ground-disturbing activity during the construction phase, the project biologist will develop a weed control plan (WCP), subject to review and approval by the Authority. The purpose of the WCP is to establish approaches to minimize and avoid the spread of invasive weeds during ground-disturbing activities during construction and operations and maintenance. The WCP will include, at a minimum, the following:</p> <ul style="list-style-type: none"> A requirement to delineate ESAs in the field prior to weed control activities. A schedule for weed surveys to be conducted in coordination with the Biological Resources Management Plan. 	Pre-construction/ construction/ post-construction	Design/ final design/ compensatory mitigation/ reporting	Yearly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement WCP minimize and avoid the spread of invasive weeds/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #1: Construction Effects on Special-Status Plant Species</p> <p>Impact BIO #3 Construction Effects on Special-Status Natural Communities</p> <p>Impact BIO #7: Operations Effects on Special-Status Plant Species</p> <p>Impact BIO #9: Operations Effects on Special-Status Natural Communities</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> Success criteria for invasive weed control. The success criteria would be linked to the Biological Resources Management Plan standards for on-site work during ground-disturbing activities. In particular, the criteria would establish limits on the introduction and spread of invasive species, as defined by the California Invasive Plant Council, to less than or equal to the pre-disturbance conditions in the area temporarily affected by ground-disturbing activities. If invasive species cover is found to exceed pre-disturbance conditions by greater than 10 percent or is 10 percent greater than levels at a similar, nearby reference site, a control effort will be implemented. If the target, or other success criteria identified in the WCP, has not been met by the end of the WCP monitoring and implementation period, the Authority will continue the monitoring and control efforts, and remedial actions will be identified and implemented until the success criteria are met. Identification of weed control treatments, including permitted herbicides and manual and mechanical removal methods. Timeframes for weed control treatment for each plant species. Identification of fire prevention measures. 								
BIO-MM#56	Conduct Monitoring of Construction Activities	During any initial ground disturbing activity, the Project Biologist will be present in the Work Area to verify compliance with avoidance and minimization measures.	Construction	Monitoring/reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Project Biologist will be present in Work Area to verify compliance with avoidance and minimization measures	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species
BIO-MM#61	Establish and Implement a Compliance Reporting Program	<p>The project biologist will prepare monthly and annual reports documenting compliance with all IAMFs, mitigation measures, and requirements set forth in regulatory agency authorizations. The Authority will review and approve all compliance reports prior to submittal to the regulatory agencies. Reports will be prepared in compliance with the content requirements outlined in the regulatory agency authorizations.</p> <p>Pre-activity survey reports will be submitted within 15 days of completing the surveys and will include:</p> <ul style="list-style-type: none"> Location(s) of where pre-activity surveys were completed, including latitude and longitude, Assessor Parcel Number, and HSR parcel number. Written description of the surveyed area. A figure of each surveyed location will be provided that depicts the surveyed area and survey buffers over an aerial image. Date, time, and weather conditions observed at each location. 	Pre-construction/ construction	Monitoring/daily reporting	Daily, monthly, and annually	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Establish and implement compliance reporting program/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> ▪ Personnel who conducted the pre-activity surveys. ▪ Verification of the accuracy of the Authority’s habitat mapping at each location, provided in writing and on a figure. ▪ Observations made during the survey, including the type and locations (written and GIS) of any sensitive resources detected. ▪ Identification of relevant measures from the Biological Resources Management Plan to be implemented as a result of the survey observations. <p>Daily compliance reports will be submitted to the Authority via Environmental Mitigation Management and Assessment (EMMA) within 24 hours of each monitoring day. Noncompliance events will be reported to the Authority the day of the occurrence. Daily compliance reports will include:</p> <ul style="list-style-type: none"> ▪ Date, time, and weather conditions observed at each location where monitoring occurred. ▪ Personnel who conducted compliance monitoring. ▪ Project activities monitored, including construction equipment in use. ▪ Compliance conditions implemented successfully. ▪ Noncompliance events observed. <p>Daily compliance reports will also be included in the monthly compliance reports, which will be submitted to the Authority by the 10th of each month and will include:</p> <ul style="list-style-type: none"> ▪ Summary of construction activities and locations during the reporting month, including any noncompliance events and their resolution, work stoppages, and take of threatened or endangered species. ▪ Summary of anticipated project activities and work areas for the upcoming month. ▪ Tracking of impacts on suitable habitats for each threatened and endangered species identified in USFWS and CDFW authorizations, including: <ul style="list-style-type: none"> – An accounting of the number of acres of habitats for which the Authority provides compensatory mitigation that has been disturbed during the reporting month, and – An accounting of the cumulative total number of acres of threatened and endangered species habitat that has been disturbed during the project period. ▪ Up-to-date GIS layers, associated metadata, and photo documentation used to track acreages disturbed. ▪ Copies of all pre-activity survey reports, daily compliance reports, and noncompliance/work stoppage reports for the reporting month. 								

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		<p>Annual reports will be submitted to the Authority by January 20 and will include:</p> <ul style="list-style-type: none"> ▪ Summary of all monthly compliance reports for the reporting year. ▪ A general description of the status of the project, including projected completion dates. ▪ All available information about project-related incidental take of threatened and endangered species. ▪ Information about other project impacts on the threatened and endangered species. ▪ A summary of findings from pre-construction surveys (e.g., number of times a threatened or endangered species or a den, burrow, or nest was encountered, location, if avoidance was achieved, if not, what other measures were implemented). ▪ Written description of disturbances to threatened and endangered species habitat within work areas, both for the preceding 12 months and in total since issuance of regulatory authorizations by USFWS and CDFW, and updated maps of all land disturbances and updated maps of identified habitat features suitable for threatened and endangered species within the project area. <p>In addition to the compliance reporting requirements outlined above, the following items will be provided for compliance documentation purposes:</p> <ul style="list-style-type: none"> ▪ If agency personnel visit the project footprint in accordance with BIO-IAMF#2, the project biologist will prepare a memorandum within 1 day of the visit that memorializes the issues raised during the field meeting. This memorandum will be submitted to the Authority via EMMA. Any issues regarding regulatory compliance raised by agency personnel will be reported to the Authority and the contractor. ▪ Compliance reporting will be submitted to the Authority via EMMA in accordance with the report schedule. The project biologist will prepare and submit compliance reports that document the following: <ul style="list-style-type: none"> – Compliance with BIO-IAMF#6: Monofilament Restrictions – Compliance with BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations – Compliance with BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes – Compliance with BIO-IAMF#10: Clean Construction Equipment – Compliance with BIO-IAMF#12: Design the Project to be Bird Safe 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> - Compliance with BIO-IAMF#9: Dispose of Construction Spoils and Waste - BMP field manual implementation and any recommended changes to construction site housekeeping practices outlined in BIO-IAMF#11: Maintain Construction Sites ▪ Work stoppages and measures taken under BIO-MM#63: Work Stoppage (see below) will be documented in a memorandum prepared by the project biologist and submitted to the Authority within two business days of the work stoppage. 								
BIO-MM#62	Prepare Plan for Dewatering and Water Diversions	Prior to initiating any construction activity that occurs within open or flowing water, the Authority will prepare a dewatering plan, which will be subject to the review and approval by the applicable regulatory agencies. The plan will incorporate measures to minimize turbidity and siltation, such as the use of silt fences, fiber rolls, and/or temporary sediment basins or settling ponds. The project biologist will monitor the dewatering and/or water diversion sites, including collection of water quality data, as applicable. Prior to the dewatering or diverting of water from a site, the project biologist will conduct pre-activity surveys to determine the presence or absence of special-status species within the affected waterbody. In the event that special-status species are detected during pre-activity surveys, the project biologist will relocate the species (unless the species is fully protected under state law), consistent with any regulatory authorizations applicable to the species.	Pre-construction/ construction	Design/ final design/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Prepare and implement dewatering and waste diversion plan/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #10: Operations Effects on Wetlands and Other Aquatic Resources Impact HWR #3: Temporary Construction Impacts to Surface Water Quality
BIO-MM#63	Work Stoppage	<p>In the event that any special-status wildlife species is found in a work area, the project biologist will have the authority to halt work to prevent the death or injury to the species. Any such work stoppage will be limited to the area necessary to protect the species and work may be resumed once the project biologist determines that the individuals of the species have moved out of harm's way or the project biologist has relocated them out of the work area.</p> <p>If any fully protected or FESA/CESA-listed species are observed within the work area at any time, work will not occur in the occupied area until appropriate measures to avoid or reduce take of any listed wildlife species are established through consultation with the USFWS and/or CDFW.</p> <p>Any such work stoppages and the measures taken to facilitate the removal of the species, if any, will be documented in a memorandum prepared by the project biologist and submitted to the Authority within 2 business days of the work stoppage.</p>	Construction	Monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Halt work to relocate special-status wildlife species (if possible)/report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species

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BIO-MM#79	Conduct Pre-Construction Protocol-Level Surveys and Construction Monitoring for Least Bell's Vireo	<p>Protocol surveys will be conducted for least Bell's vireo during the breeding season at least 2 years prior to the commencement of HSR project activities within a 500-foot buffer of the HSR footprint at the following locations: (1) the Verdugo Wash Bridge Replacement area, (2) the Metrolink Central Maintenance Facility, and (3) rail alignment work between I-5 and SR 2 (including areas adjacent to Rio de Los Angeles State Park). Protocol surveys will be repeated within 1 year prior to the commencement of vegetation clearing and construction activities in these locations to ensure that survey information for the HSR project remains up to date. The protocol surveys will be conducted by a qualified designated biologist(s) in accordance with the most recent USFWS guidelines. All survey results will be submitted to the USFWS Carlsbad Fish and Wildlife Office.</p> <p>Weekly surveys and monitoring of suitable least Bell's vireo habitat within 500 feet of the HSR footprint will be conducted by the designated biologist(s) if construction activities are occurring in these areas during the vireo breeding season (March 15 to September 15).</p>	Pre-construction	Monitoring/reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction surveys of Least Bell's Vireo habitat/ establish, and maintain no-work buffer/ report findings	Condition of design-build contract/ condition of regulatory permits	Impact BIO #2: Construction Effects on Special-Status Wildlife Species
BIO-MM#80	Implement Impact Avoidance and Minimization Measures for Occupied Least Bell's Vireo Habitat	<p>The following measures will be implemented to avoid and minimize HSR project impacts on suitable least Bell's vireo habitat occurring within a 500-foot buffer of the HSR footprint at (1) the Verdugo Wash Bridge Replacement area, (2) the Metrolink Central Maintenance Facility, and (3) rail alignment work between I-5 and SR 2 (including areas adjacent to Rio de Los Angeles State Park):</p> <ul style="list-style-type: none"> ▪ HSR construction activities will be limited to daylight hours during the vireo breeding season. ▪ For any work proposed within 500 feet of vireo occupied habitat during the vireo breeding season, the occupied habitat shall be clearly delineated and no work shall occur within occupied habitat without the USFWS' written approval. In addition, onsite noise-reduction/attenuation techniques shall be incorporated, as appropriate, to avoid impacts on least Bell's vireo from elevated construction noise levels during the breeding season. Noise monitoring will be implemented by the designated biologist(s) during the breeding season to ensure that elevated construction noise levels are appropriately attenuated at the edge of vireo occupied habitat to a level that is not expected to adversely affect nesting bird behavior (i.e., not to exceed an hourly average of 3 dBA above existing ambient levels at the edge of vireo occupied habitat). If specific HSR project construction noise levels would exceed this threshold within 500 feet of occupied least Bell's vireo habitat during the vireo breeding season, the USFWS Carlsbad Fish and Wildlife Office will be contacted for guidance on additional noise- 	Pre-construction/ construction	Surveying/ monitoring/ reporting	Weekly or as established by regulatory compliance agencies	Authority/ Contractor/ Project Biologist	Authority/ Contractor/ Project Biologist	Pre-construction surveys of Crotch bumblebee habitat/establish and maintain no-work buffer/ report findings	Condition of design-build contract/ condition of regulatory permits	<p>Impact BIO #2: Construction Effects on Special-Status Wildlife Species</p> <p>Impact BIO #8: Operations Effects on Special-Status Wildlife (nesting birds and roosting bats)</p>

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		reduction measures and written approval, which must be received before such activities are performed.								
Hydrology and Water Resources										
HWR-MM#1	Below-Grade Section Constructability and Hydrogeological Monitoring	<p>The Authority would implement the following mitigation measures to reduce hydrogeological impacts associated with construction of the below grade sections:</p> <ul style="list-style-type: none"> Excavation of the below grade sections would include continuous probing to assess the ground and groundwater conditions. Pre-excavation grouting would be used to control groundwater inflows and provide face stability where applicable. Should areas of abnormally high flow be encountered, drilling would stop and methods reevaluated to minimize potential impacts to surface water features and groundwater aquifers. All below-grade sections would be waterproofed. The lining of the below-grade section would be designed to withstand construction, ground, seismic, and hydrostatic loads. The lining of the below grade sections would be inspected regularly throughout the construction phase to monitor for potential leaks. Should leaks be found, the lining would be repaired. Groundwater infiltration would be treated and disposed of in accordance with state and local regulations. If it is determined that the below-grade sections will be below the groundwater table, a groundwater monitoring plan would be prepared and implemented. Monitoring may include measurements of water levels in wells, inflows into the below-grade sections, probe-hole flow, and portal discharges. Monitoring of groundwater, if impacted, would continue until the groundwater system has normalized to pre-construction conditions. The Authority would develop a plan to inspect the below-grade sections after seismic events to assess and seal leaks exceeding set inflow criteria. 	Construction	Reporting and monitoring	Weekly	Contractor/ local districts	Contractor	Construction/ weekly reporting	Reporting contract requirements/ specifications	Impact HWR #5: Temporary Impacts on Groundwater Volume, Quality, and Recharge during Construction
Hazardous Materials and Wastes										
HMW-MM#1	Limit Use of Extremely Hazardous Materials near Schools during Construction	Prior to construction, the Contractor will prepare a memorandum establishing BMPs regarding hazardous materials best management practices related to construction activity for approval by the Authority. The memorandum and a signed agreement as well as the CMP will confirm that the Contractor will not handle or store an extremely hazardous substance (as defined in California Public Resources Code § 21151.4) or a mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and	Pre-construction/ construction	Reporting and monitoring	Memorandum approved 30 days prior to start of construction. During construction, submit weekly reports or reporting	Contractor Hazardous Materials Monitor	Contractor	Hazardous materials memorandum/ weekly reporting	Hazardous materials memorandum	Impact HMW #5: Emit Hazardous Emissions or Handle of Hazardous or Acutely Hazardous Materials, Substances, or Waste within 0.25 Mile of a School during Construction

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		Safety Code within 0.25 mile of a school. The memorandum, signed agreement, and Construction Management Plan will acknowledge that, prior to construction activities, signage would be installed to delimit all work areas within 0.25 mile of a school, informing all personnel associated with construction of the Project not to bring extremely hazardous substances into the area. The Contractor would be required to monitor all use of extremely hazardous substances as delineated in the CMP. This construction mitigation measure for hazardous materials and wastes is consistent with California Public Resources Code Section 21151.4. The memorandum, signed agreement, and CMP will be submitted to the Authority prior to any construction.			requirements as established by the approved memorandum					

Safety and Security

S&S-MM#1	Monitor Response of Local Fire, Rescue, and Emergency Service Providers to Incidents at Stations and Provide a Fair Share Cost of Service	<p>During operation of the HSR system, the Authority would monitor the response of the local fire rescue and emergency service providers to incidents at the HSR stations and provide a fair share of cost of service.</p> <p>During the first 3 years of operation and maintenance, the Authority shall begin monitoring response of local fire, rescue, and emergency service providers to incidents at stations and provide a fair share of cost of service. Monitoring should begin 1 year prior to planned opening of an HSR station. Service levels consist of the monthly volume of calls for fire and police protection, as well as county-, city- or fire protection district-funded emergency medical technician/ambulance calls that occur in the station site service areas. Prior to operation of the stations for HSR service, the Authority would enter into an agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services above the average baseline service demand level for the station service areas (as established during the monitoring period). The fair share would be based on projected passenger use for the first year of operations, with a growth factor for the first 5 years of operation. This cost-sharing agreement would include provisions for ongoing monitoring and future negotiated amendments as the stations are expanded or passenger use increases. Such amendments would be made on a regular basis for the first 5 years of station operation, as would be provided in the agreement. To make sure that services are made available, impact fees would not constitute the sole funding mechanism, although impact fees may be used to fund capital improvements or fixtures (e.g., police substation, additional fire vehicle, on-site defibrillators) necessary to service delivery. After the first 5 years of operation, the Authority would enter into a new or revised agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services. The fair share would take into account the volume of ridership, past record and trends in service demand at the stations, new</p>	Construction/ post-construction/ operation	Monitor/ Fair Share Agreement	Annually	Authority	Authority	Monitoring of service levels during construction and operation to determine baseline service demands, Fair share agreement	Authority to fund through fair share of services agreement	Impact S&S #11: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities
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Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		local revenues derived from station area development, and any services that the Authority may be providing at the station.								
Parks, Recreation, and Open Space										
PR-MM#1	Temporary Restricted Access to Park Facilities During Construction	Prior to construction (any ground-disturbing activity impacting trails), the contractor will prepare a technical memorandum documenting how connections to the unaffected trail portions and nearby roadways will be maintained during construction. The contractor will provide alternative access via a temporary detour of the trail using existing roadways or other public rights-of-way. The contractor will be required to provide detour signage and lighting and will provide that the alternative routes meet public safety requirements. The technical memorandum will be submitted to the California High-Speed Rail Authority (Authority) for review and approval.	Pre-construction/ construction	Technical memorandum; compliance reporting	Weekly	Contractor	Contractor	Technical memorandum prior to construction/ weekly reporting	Condition of design-build contract	Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction
PR-MM#2	Providing Park Access	Prior to construction (any ground-disturbing activity affecting park access), the contractor will prepare a technical memorandum documenting how the contractor will ensure that connections to the unaffected park portions or nearby roadways will be maintained after construction. If a proposed linear park closure restricts connectivity, the contractor would provide permanent access via existing roadways or other public rights-of-way. The technical memoranda will be submitted to the Authority for review and approval.	Pre-construction/ construction/ post-construction/ operation	Technical memorandum/ compliance reporting	Weekly or at other appropriate interval	Contractor	Contractor	Technical memorandum prior to construction/ weekly reporting, or at other appropriate interval	Condition of design-build contract	Impact PK #5: Changes to Park or Recreation Facility Use or Character Due to Operation
PR-MM#3	Temporary Closures and Detours of Existing Trails and Bicycle Lanes	<ul style="list-style-type: none"> ▪ Trail and Bicycle Lane Facilities Plan—During final design, the Authority’s project engineer will require the design/build contractor to develop a Trail and Bicycle Lane Facilities Plan addressing the short term project impacts on existing trails and bicycle lanes within the construction limits of the project. That plan will address: <ul style="list-style-type: none"> – Identifying trails and bicycle lanes that will be closed temporarily and detoured during construction – Preparing a public awareness and notification plan – Temporarily closing trails and bicycle lanes during construction – Developing and implementing detours for temporarily closed trails and bicycle lanes – Phasing of temporary trail and bicycle lane closures to allow for effective detours to maintain connectivity of these facilities around the construction areas – Coordinating the trail and bicycle lane closures and detours with the local jurisdictions with authority over those facilities – Criteria for identifying detour routes and facilities – Information signing for closures and detours – Requirements for compliance with the Americans with Disabilities Act during construction 	Pre-construction/ construction	Design/ reporting/ funding	Prior to final design	Authority	Authority	Before final design	Condition of design-build contract/ Authority to provide compensation	Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> - Maintaining signing for closures and detours throughout the closure period and replacing lost or damaged signing - Restoring trails and bicycle lanes to their original or better condition at the completion of project construction ▪ Temporary Closures of Trails and Bicycle Lanes—Prior to any temporary closures of trails and bicycle lanes, the Authority’s project engineer will require the design/build contractor to coordinate with the directors of the appropriate jurisdictions’ public works and/or parks departments, or their representatives, to review the location of and need for each temporary trail or bicycle lane closure. The Authority’s Project Engineer will require the design/build contractor to develop detours for each closure in consultation with the public works and/or parks department directors or their representatives. Prior to and during construction activities that will require the temporary closure of a trail or bicycle lane, the Authority’s project engineer will require the design/build contractor to comply with and implement the procedures in the Trail and Bicycle Lane Facilities Plan, described above, for the affected trails and bicycle lanes. ▪ Signing for Trail and Bicycle Lane Detours and Closures—The Authority’s project engineer will require the design/build contractor to develop detour signs, in consultation with the appropriate jurisdictions’ public works and/or parks departments, notifying trail and bike lane users of the upcoming temporary facility closure and directing the trail and bicycle lane users to the temporary detour routes with estimated timeframes. Appropriate directional and informational signage will be provided by the project design/build contractor prior to each closure and far enough in advance of the closure so trail and bicycle lane users will not have to backtrack to get to the detour routes. ▪ Contact Information at Trail and Bicycle Lane Detours—The Authority’s project engineer will require the design/build contractor to provide detour signing that includes contact information for the Authority’s project engineer and the design/build contractor, and that informs trail users to contact the project engineer and/or the design/build contractor with questions or concerns regarding upcoming or active temporary trail and bicycle lane closures. ▪ Restoration of Impacted Trail and Bicycle Lane Segments—The Authority’s project engineer will require the design/build contractor to return trail and bike path segments closed temporarily during construction to their original, or better, condition after completion of construction, prior to their return to the control of the applicable public works or parks department. After project construction, the Authority’s project 								

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		<p>engineer will require the design/build contractor to document that access to and connectivity of the affected trails and bicycle lanes were restored.</p> <ul style="list-style-type: none"> Compliance with the Trails and Bicycle Lane Facilities Plan—Compliance with the Trails and Bicycle Lane Facilities Plan will be documented in the environmental commitments record with text, photographs, maps, and correspondence, as appropriate. 								
PR-MM#4	Replacement of Property Acquired from Existing or Planned Bicycle Routes	<p>During the right-of-way acquisition process, the Authority will consult with the public agency with jurisdiction over any existing or planned bicycle routes regarding the specific conditions of acquisition and replacement of the land that will be acquired.</p> <p>Where property that contains existing or planned bicycle paths required for HSR improvements involves the establishment of a permanent easement or permanent conversion to rail right-of-way from lands owned by the Metro, the Authority will consult with the officials with jurisdiction to identify an alternative route for the continuation of the lost use and functionality of the resource, including maintaining connectivity. The identification of the alternative route must be determined to be feasible for the intended use by the respective Public Works Department, or Parks and Recreation Department or other equivalent authority within the affected city prior to the establishment of the permanent easement or permanent conversion of the Metro-owned lands.</p>	Pre-construction	Final design/consultation	Prior to final design	Authority	Authority	Authority to provide compensation or land or both per Public Resources Code Division 5, Chapter 2.5, Section 5401 of the California Park Preservation Act	Authority to provide compensation as required	<p>Impact PK #3: Permanent Easements or Acquisition of Property from Parks, Recreation, and School Play Area Resources Due to Construction</p> <p>Impact PK #4: Changes to Planned Parks and Recreational Resources Due to Construction</p> <p>Impact PK #5: Changes to Park or Recreation Facility Use or Character Due to Operation</p>
PR-MM#5	Temporary Use of Land from Park, Recreation, or School Play Areas during Construction	<ul style="list-style-type: none"> Temporary Impact Areas—During final design, the California High-Speed Rail Authority’s (Authority) Project Engineer will evaluate all proposed temporary impact areas in parks, recreational resources, and school play areas and will identify opportunities to further reduce the sizes of those temporary impact areas. All temporary impact areas in parks, recreational resources, and school play areas shown on the project plans and specifications will include notes that the design/build contractor cannot increase the size of any of those areas without consultation with and approval by the project engineer and appropriate subsequent environmental review. Compensation for Temporary Impact Areas—During final design, the Authority’s project engineer will consult with the affected jurisdictions and property owners to discuss the temporary impact areas needed for construction of the High-Speed Rail (HSR) Build Alternative and to determine the appropriate level of compensation for the use of land from park, recreation, or school play areas for the established temporary impact areas. It is anticipated that the compensation would be payments for the temporary use of land from those resources for the period of time that land is used for temporary impact areas during project construction. 	Pre-construction/ construction	Final design/consultation	Prior to final design/ monthly reporting	Authority/ Contractor	Authority/ Contractor	Before final design/ monthly	Authority to consult as required/ monthly reporting	Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<ul style="list-style-type: none"> ▪ Access Restrictions at Temporary Impact Areas—The Authority’s project engineer will require the design/build contractor to fence and gate all land in parks, recreation facilities, and school play areas used for temporary impact areas. The temporary impact areas will be appropriately signed to restrict access to those areas by park and recreational resource patrons and users of school play areas. The Authority’s project engineer will require the design/build contractor to maintain the fencing throughout the time period each temporary impact area is used and to remove the fencing only after all construction activity in an area is completed, the temporary impact area is no longer needed, and the land is ready to be returned to the property owner. ▪ Signing of Fenced Temporary Impact Areas—The Authority’s project engineer will require the design/build contractor to provide signing at each temporary impact area explaining why the area is fenced and access to the temporary impact area is restricted, the anticipated completion date of the use of the land for the temporary impact area, and contact information (for both the Authority’s project engineer and the design/build contractor) for the public to solicit further information regarding the temporary impact area and the project. ▪ Modifications to Recreation Uses—In the event a temporary impact area requires the temporary use of land at a park, recreational resource, or school play area that is used for recreation purposes, the Authority’s project engineer will consult with the property owner/operator on: (1) whether the property owner/operator wants those recreation uses replaced temporarily elsewhere on the property, and (2) if temporary replacement of those recreation uses is desired, modifications that could be made to the remaining recreation area on the property to temporarily replace the recreation uses displaced by the temporary impact area. Any modifications to recreation areas outside the limits of a temporary impact area will be constructed/implemented prior to fencing and use of the temporary impact area. ▪ Return of Land Used by Temporary Impact Areas to the Property Owners—The Authority’s project engineer will require the design/build contractor to return the land used for each temporary impact area to the owner in its original or better condition when construction in an area has been completed and the temporary impact area is no longer needed. The Authority’s project engineer will require the design/build contractor to coordinate the restoration of the affected land with the property owner and the project engineer. 								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Aesthetics and Visual Resources										
AVQ-MM#1	Minimize Visual Disruption from Construction Activities	<p>Prior to construction (any ground-disturbing activity), the contractor shall prepare a technical memorandum identifying how the project will minimize construction-related visual/aesthetic disruption and include the following activities:</p> <ul style="list-style-type: none"> Minimize pre-construction clearing to that necessary for construction. Limit the removal of buildings to those that would conflict with project components. When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views. After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material similar in numbers and types to that that was removed, based upon local jurisdictional requirements. If no local jurisdictional requirements exist, replace removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and a 2:1 replacement ratio for mature trees. For example, if the contractor removes 10 mature trees in an area, replant 20 younger trees that within 5 to 15 years (depending upon the growth rates of the trees) would be of a height and spread to provide visual screening similar to the visual screening provided by the trees that were removed for construction. Replaced shrubs shall be a minimum 5 gallons and replaced trees shall be a minimum 24-inch box and minimum 8 feet in height. To the extent feasible, do not locate construction staging sites within the immediate foreground distance (0 to 500 feet) of existing residential neighborhoods, recreational areas, or other land uses that include high-sensitivity viewers. Where such siting is unavoidable, screen staging sites from viewers using appropriate solid screening materials such as temporary fencing and walls. Paint over or remove any graffiti or visual defacement of temporary fencing and walls within 5 business days of it occurring. <p>The technical memorandum will be submitted to the Authority for review and approval.</p>	Pre-construction/ construction/ post-construction	Prepare technical memorandum	Prior to construction	Contractor	Contractor	Prior to construction	Contract requirements and specifications	Impact AVQ #1: Visual Disturbance during Construction
AVQ-MM#2	Minimize Light Disturbance during Construction	<p>Prior to construction (any ground-disturbing activity requiring nighttime construction), the Contractor shall prepare a technical memorandum verifying how they will shield nighttime construction lighting and direct it downward in such a manner to minimize the light that falls outside the construction site boundaries.</p> <p>The technical memorandum shall be submitted to the Authority for review and approval.</p>	Pre-construction/ construction	Prepare technical memorandum	Prior to construction	Contractor	Contractor	Prior to construction	Contract requirements and specifications	Impact AVQ #2: Nighttime Lighting during Construction

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
AVQ-MM#3	Incorporate Design Aesthetic Preferences into Final Design and Construction of Non-Station Structures	Prior to construction (any ground disturbing activity), the Contractor shall work with the Authority and local jurisdictions to incorporate the Authority-approved aesthetic preferences for non-station structures into final design and construction. A technical memorandum will be submitted to the Authority to document compliance.	Pre-construction/ construction	Compliance report	Prior to construction	Contractor	Contractor	Prior to construction	Contract requirements and specifications	Impact AVQ #1: Visual Disturbance during Construction Impact AVQ #3: Visual Quality in the Burbank to Los Angeles Project Section
AVQ-MM#4	Provide Vegetation Screening along At-Grade and Elevated Guideway Adjacent to Residential Areas	Prior to operation and maintenance of HSR, the Contractor will plant trees (minimum 24-inch box and 8 feet in height) along the edges of the HSR rights-of-way in locations adjacent to residential areas to visually screen the elevated guideway and the residential area. The species of trees to be installed will be selected based on their mature size and shape, growth rate, hardiness, and drought tolerance. No species on the Invasive Species Council of California's list will be planted. Upon maturity, the crowns of trees used will be tall enough to partially, or fully, to screen views of the elevated guideway from adjacent at-grade areas. Upon maturity, trees will allow ground-level views under the crowns (with pruning if necessary) and will not interfere with the 15-foot clearance requirement for the guideway. The trees will be maintained. Irrigation systems will be installed within the tree planting areas. The Contractor shall prepare a technical memorandum within 90 days of completing any construction section or segment documenting the species of trees that were incorporated into the edges of the HSR right-of-way adjacent to residential uses. The technical memorandum will be submitted to the Authority to document compliance.	Construction/ post-construction	Plant trees/ compliance report	Prior to operation planting trees/ 90 days of completing any construction section or segment documenting the species of trees that were incorporated into design	Contractor	Contractor	Prior to operation, planting trees/ 90 days of completing any construction section or segment documenting the species of trees that were incorporated into design	Contract requirements, specifications; landscaping, and maintenance will be provided by the Contractor for its scope of work until completion of the work at which time the Authority shall assume responsibility for landscaping or assign the responsibility to other third parties	Impact AVQ #3: Visual Quality in the Burbank to Los Angeles Project Section
AVQ-MM#6	Screen Traction Power Distribution Stations and Radio Communication Towers	Within 90 days of completing traction power substation or radio tower construction, the Contractor will screen from public view the traction power substations (at approximately 30-mile intervals along the HSR guideway), including radio towers where required, through the use of landscaping or solid walls/fences. This will consist of context-appropriate landscaping of a type and scale that does not draw attention to the station or feature. Plant species will be selected based on their mature size and shape, growth rate, hardiness, and drought tolerance. Planted shrubs shall be a minimum 5 gallon and trees shall be a minimum 24" box and 8' in height. No species on the Invasive Species Council of California's list will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed within the landscaped areas. Walls will be constructed of cinder-block, or similar material, and will be painted a neutral color to blend in with the surrounding context. If a chain-link or cyclone fence is used, it will include slats in the fencing. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable period as agreed between the Authority and local jurisdiction. None of the	Post-construction/ operations	Plant vegetation/ reporting	Prior to operation and maintenance planting trees/ monthly reporting	Contractor	Authority	Prior to operation and maintenance planting trees/ monthly reporting	Authority to implement appropriate landscape and maintenance plan	Impact AVQ #3: Visual Quality in the Burbank to Los Angeles Project Section

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>mitigation measure options is expected to result in secondary effects. The mitigation measures are typical of visual treatments applied on linear transportation facilities; they have been defined to be specific in range and implementable according to context, and designed in coordination with local jurisdictions.</p> <p>The Contractor shall prepare a technical memorandum documenting how the requirements in this measure were implemented. The technical memorandum will be submitted to the Authority to document compliance.</p>								
AVQ-MM#7	Provide Sound Barrier Treatments	<p>Prior to Construction (any ground-disturbing activity), the Contractor shall design a range of sound barrier treatments for visually sensitive areas, such as those areas where residential views of open landscaped areas would change or in urban areas where sound barriers would adversely affect the existing character and setting. The Contractor shall develop the treatments during the final design process and integrate them into the final project design. The treatments shall include, but are not limited to, the following:</p> <ul style="list-style-type: none"> ▪ Sound barriers along elevated guideways that may incorporate transparent materials where sensitive views would be adversely affected by opaque sound barriers. ▪ Sound barriers made with nonreflective materials and of a neutral color. ▪ Surface design enhancements and vegetation appropriate to the visual context of the area shall be installed with the sound barriers. Vegetation shall be installed consistent with the provisions of project mitigation measure AVQ-MM#5. Surface enhancements shall be consistent with the design features developed for project mitigation measure AVQ-MM#3 and shall include architectural elements (e.g., stamped patterns, surface articulation, decorative texture treatment), as determined acceptable to the local jurisdiction. Surface coatings shall be used on wood and concrete sound barriers to facilitate cleaning and the removal of graffiti. <p>The Contractor shall prepare a technical memorandum documenting implementation and submit it to the Authority to demonstrate compliance.</p>	Pre-construction/ construction	Reporting	Monthly	Contractor	Contractor	Construction/ monthly	Contract requirements/ specifications	Impact AVQ #3: Visual Quality in the Burbank to Los Angeles Project Section

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
Cultural Resources										
CUL-MM#1	Mitigate Adverse Effects to Archaeological and Built Environment Resources Identified During Phased Identification. Comply with the Stipulations Regarding the Treatment of Archaeological and Historic Built Resources in the Programmatic Agreement (PA) and Memorandum of Agreement (MOA)	<p>Once parcels are accessible and surveys have been completed, including consultation as stipulated in the MOA, additional archaeological resources may be identified. All built environment resources were adequately visible from the public right-of-way and will not likely require phased identification. For newly identified eligible properties that would be adversely affected, the following process would be followed, which is presented in detail in the BETP and ATP:</p> <ul style="list-style-type: none"> ▪ The Authority would consult with the MOA signatories and concurring parties to determine the preferred treatment of the properties/resources and appropriate mitigation measures. ▪ For CRHR-eligible archaeological resources, the Authority would determine if these resources can feasibly be preserved in place or if data recovery is necessary. The methods of preservation in place would be considered in the order of priority provided in CEQA Guidelines § 15126.4(b)(3). If data recovery is the only feasible treatment, the Authority would adopt a Data Recovery Plan as required under CEQA Guidelines § 15126.4(b)(3)(C). ▪ Should data recovery be necessary, the Contractor's Principal Investigator, in consultation with the MOA signatories and consulting parties, would prepare a Data Recovery Plan for approval from the Authority, also in consultation with the MOA signatories. Upon approval, the Contractor's Principal Investigator would implement the plan. ▪ For archaeological resources, the Authority would also determine if the resource is a unique archaeological site under CEQA. If the resource is not a historical resource but is an archaeological site the resource would be treated as required in Cal. Public Res. Code 21083.2 by following protection, data recovery, and other appropriate steps outlined in the ATP. The review and approval requirements for these documents are outlined in the ATP. 	Pre-construction/ construction	Reporting	Weekly	Contractor/ Authority	Contractor/ Authority	Pre-construction surveys and construction/ weekly reporting or as dictated by the ATP and the MOA	PA	Impact CUL #1: Construction Effects on Known Archaeological Resources Impact CUL #2: Construction Effects on Unknown Archaeological Resources
CUL-MM#2	Halt Work in the Event of an Archaeological Discovery and Comply with the Programmatic Agreement, Memorandum of Agreement, Archaeological Treatment Plan, and all State and Federal Laws, as applicable.	During construction (i.e., any ground-disturbing activities, including clearing and grubbing) should there be an unanticipated discovery, the Contractor shall follow the procedures for unanticipated discoveries as stipulated in the PA, MOA, and associated ATP. The procedures must also be consistent with the following: the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Federal Register 44716-42), as amended (National Park Service); and Guidelines for the Implementation of CEQA, as amended (Title 14 California Code of Regulations Chapter 3, Article 9, Sections 15120-15132). In the event of a discovery in California Department of Transportation (Caltrans) right-of-way, the Authority would notify appropriate Caltrans staff	Construction	Reporting	During construction	Contractor/ Authority	Contractor	Daily logs (during active monitoring)	ATP/MOA	Impact CUL #2: Construction Effects on Unknown Archaeological Resources

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>in accordance with any provisions of the ATP. Should the discovery include human remains, the Contractor, the Authority, and the FRA shall comply with federal and state regulations and guidelines regarding the treatment of human remains, including relevant sections of Native American Graves Protection and Repatriation Act (§ 3(c)(d)); California Health and Safety Code, Section 8010 et seq.; and Cal. Public Res. Code Section 5097.98; and consult with the Native American Heritage Commission, tribal groups, and the SHPO.</p> <p>In the event of an unanticipated archaeological discovery, the contractor would cease work in the immediate vicinity of the find, based on the direction of the archaeological monitor or the apparent location of cultural resources if no monitor is present. If no qualified archaeologist is present, no work can commence until it is approved by the qualified archaeologist in accordance with the MOA, ATP, and monitoring plan. The Contractor's qualified archaeologist would assess the potential significance of the find and make recommendations for further evaluation and treatment as necessary. These steps may include evaluation for the CRHR and NRHP and necessary treatment to resolve significant effects if the resource is an historical resource or historic property. If, after documentation is reviewed by the Authority, and they determine it is a historic property, and the SHPO concurs that the resource is eligible for the NRHP, or the Authority determines it is eligible for the CRHR, preservation in place would be considered by the Authority in the order of priority provided in CEQA Guidelines § 15126.4(b)(3) and in consultation with the signatories and consulting parties to the MOA. If data recovery is the only feasible mitigation, the Contractor's qualified Principal Investigator would prepare a data recovery plan as required under CEQA Guidelines § 15126.4(b)(3)(C), the MOA, and ATP for the Authority's approval.</p> <p>If human remains are discovered on state-owned or private lands the contractor would contact the relevant county coroner to allow the coroner to determine if an investigation regarding the cause of death is required. If no investigation is required and the remains are of Native American origin, the Authority would contact the Native American Heritage Commission to identify the most likely descendant. The most likely descendant would be empowered to reinter the remains with appropriate dignity. If the most likely descendant fails to make a recommendation, the remains would be reinterred in a location not subject to further disturbance and the location would be recorded with the Native American Heritage Commission and relevant information center of the CHRIS.</p> <p>If human remains are part of an archaeological site, the Authority and contractor would, in consultation with the most likely descendant and other consulting parties, consider preservation</p>								

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		<p>in place as the first option, in the order of priority called for in CEQA Guidelines Section 15126.4(b)(3).</p> <p>In consultation with the relevant Native American tribes, the Authority may conduct scientific analysis on the human remains if called for under a Data Recovery Plan and amenable to all consulting parties. The Authority would work with the most likely descendant to satisfy the requirements of Cal. Public Res. Code Section 5097.98. Performance tracking of this mitigation measure would be based on successful implementation and acceptance of the documentation by the SHPO and appropriate consulting parties.</p>								
CUL-MM#3	Other Mitigation for Effects to Archaeological Sites	<p>Due to limited access to private properties during the environmental review phase of this project, the Authority's ability to fully identify and evaluate archaeological resources within the APE has, correspondingly, also been limited. Thus, the majority of the project APE has not been subject to archaeological field inventories. As pedestrian field surveys are a necessary component of the archaeological resource identification and evaluation effort, the commitment to complete the field surveys, prior to ground-disturbing activities associated with the project, would be codified in the MOA that would be executed as a condition of this Final EIR/EIS.</p> <p>Access to previously inaccessible properties to complete the archaeological resource identification effort is expected to be available after the Record of Decision, during the design-build phase of the project. However, due to the design constraints associated with constructing an HSR system, the ability to shift the alignment to avoid any newly identified archaeological resources at this late phase of the project delivery process would be substantially limited and/or unlikely, because the alignment would already be established. As such, impacts/effects on as-yet-unidentified significant archaeological resources as a result of this project are anticipated; however, the nature and quantity of such effects remains unknown until completion of the archaeological field identification and evaluation effort.</p> <p>Protocols for the identification, evaluation, treatment, and data-recovery mitigation of as-yet-unidentified archaeological resources are addressed in the MOA and ATP. Efforts to develop meaningful mitigation measures for effects on as-yet-unidentified Native American archaeological resources or historic-era archaeological resources that cannot be avoided would be negotiated with the tribal consulting parties or other interested parties, as appropriate. Measures that are negotiated among the MOA signatories and tribal consulting parties would be the responsibility of the Authority to implement.</p>	Pre-construction	Pre-construction surveys	Prior to ground-disturbing activities	Authority	Authority	Prior to ground-disturbing activities	ATP/MOA	Impact CUL #2: Construction Effects on Unknown Archaeological Resources

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
CUL-MM#7	Prepare Interpretive or Educational Materials	<p>The Authority-prepared MOA and BETP would identify historic properties and historical resources that would be subject to historic interpretation or preparation of educational materials. Interpretive and educational materials would address the significance of the properties that would be affected by the project. Interpretive or educational materials could include, but are not limited to, brochures, videos, websites, study guides, teaching guides, articles or reports for general publication, commemorative plaques, or exhibits. The agreed-upon method of interpretation would be specified in the BETP for each property, resulting from consultation with the SHPO, MOA signatories, and concurring parties. The Contractor would be responsible for assembling the appropriate interdisciplinary team to fulfill the mitigation. The required professionals and their qualifications would be specified in the BETP.</p> <p>In the preparation of the interpretive or educational materials, the Contractor's team would use previous research included in the environmental technical documents, images, narrative history, drawings, or other material produced for the mitigation described above. The interpretive or educational materials should be made available to the public in physical or digital formats, at local libraries, historical societies, or public buildings, as specified in the BETP.</p>	Post-construction	Reporting	Annual	Authority	Post-construction/annual reporting	Authority, in consultation with SHPO and appropriate consulting parties	BETP, Photographic documentation, plan for repairs to historic properties	Impact CUL #3: Construction Effects on Historic Built Resources
CUL-MM#12	Design of Intrusion Protection Railing for Historic Bridges	A property-specific mitigation measure is proposed, requiring the Authority to work with consulting parties to develop a design for an intrusion-protection railing that would minimize the potential direct adverse effect to the maximum extent feasible. A new intrusion-protection railing would be built on the historic bridge decks above the HSR alignment to prevent people and objects from entering the right-of-way from the bridge. This would apply to three historic resources: the Arroyo Seco Parkway Historic District (specifically the Los Angeles River Bridge), the Broadway Viaduct, and the Spring Street Viaduct.	Pre-Construction	Pre-construction surveys	Prior to ground-disturbing activities	Authority	Authority	Prior to ground-disturbing activities	Meetings with departments/agencies	Impact AVQ #1: Visual Disturbance during Construction Impact CUL #3: Construction Effects on Historic Built Resources
CUL-MM#13	Main Street Bridge Access Feasibility Study	A property-specific mitigation measure is proposed, stating that the Authority would facilitate the development of a feasibility study to explore design options that would maintain the historic use of the Main Street Bridge to the maximum extent feasible while still meeting the safety requirements of the HSR Build Alternative.	Pre-Construction	Pre-construction surveys	Prior to ground-disturbing activities	Authority	Authority	Prior to ground-disturbing activities	Meetings with departments/agencies	Impact CUL #3: Construction Effects on Historic Built Resources
Cumulative Impacts										
CUM-TRAN-MM#1 (NEPA Only)	Consult with Agencies Regarding Construction Traffic Impacts	To reduce the potential overlapping traffic impacts on the same intersections and roadways from detours and closures, the Authority would consult with local city and county planning departments and other agencies with projects anticipated to be constructed concurrently with the Burbank to Los Angeles Section of the California HSR System. Consultation would entail notifying the departments/agencies regarding the anticipated	Pre-Construction/Construction	Notify and consult with departments/agencies	Monthly	Contractor/Authority	Contractor	Monthly, record keeping, and reporting	Meetings with departments/agencies	Cumulative Construction Impacts to Transportation

Mitigation Measure	Title	Mitigation Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Text
		HSR construction, detour, and closure schedules and would allow for adjustment of construction schedules for adjacent projects or projects near the HSR Build Alternative.								
CUM-N&V-MM#1	Consult with Agencies Regarding Construction Noise and Vibration Impacts	To reduce the potential overlapping noise- and vibration-generating construction activities in the same area, the Authority would consult with local city and county planning departments and other agencies with projects anticipated to be constructed concurrently with the Burbank to Los Angeles Section of the California HSR System. Consultation would entail notifying the departments/agencies regarding the anticipated HSR construction schedule and would allow for adjustment of construction schedules for adjacent projects or projects near the HSR Build Alternative.	Pre-Construction/Construction	Notify and consult with departments/agencies	Monthly	Contractor/Authority	Contractor	Monthly, record keeping, and reporting	Meetings with departments/agencies	Cumulative Construction Impacts to Noise and Vibration
CUM-S&C-MM#1 (NEPA Only)	Cumulative Construction Impacts on Communities	During construction of the HSR Build Alternative, consultation would occur with the project sponsors or other entities, including local or regional governments, to coordinate construction schedules and potential closures, detours, and other elements of construction in order to reduce impacts on surrounding communities. Such coordination would include planning for vehicular, pedestrian, and bicycle detours, performing community outreach to make residents and businesses aware of potential issues in advance, and allowing for public input and feedback in planning for construction.	Pre-Construction/Construction	Notify and consult with departments/agencies	Prior to ground-disturbing activities and during construction	Contractor/Authority	Contractor	Prior to ground-disturbing activities	Meetings with departments/agencies	Cumulative Construction Impacts to Population and Communities

APE	area of potential effects	EMI	electromagnetic interference	NEPA	National Environmental Policy Act
ATP	Archaeological Treatment Plan	EMMA	Environmental Mitigation Management and Assessment system	NRHP	National Register of Historic Places
Authority	California High-Speed Rail Authority	ESA	environmentally sensitive area	PA	Programmatic Agreement
BETP	built environment treatment plan	FESA	Federal Endangered Species Act	RF	radio frequency
BMP	best management practice	FRA	Federal Railroad Administration	ROD	records of decision
C.F.R.	Code of Federal Regulations	GIS	geographic information system	RWQCB	Regional Water Quality Control Board
Cal. Public Res. Code	California Public Resources Code	HSR	high-speed rail	SCAQMD	South Coast Air Quality Management District
Caltrans	California Department of Transportation	I	Interstate	SHPO	State Historic Preservation Officer
CDFW	California Department of Fish and Wildlife	IAMF	impact avoidance and minimization feature	SOQ	Statement of Qualification
CEQA	California Environmental Quality Act	LADWP	Los Angeles Department of Water and Power	SR	State Route
CESA	California Endangered Species Act	LAUS	Los Angeles Union Station	US-101	U.S. Route 101
CHRIS	California Historical Resources Information System	L _{eq}	equivalent sound level	USEPA	U.S. Environmental Protection Agency
CMP	Compensatory Mitigation Plan	LOS	level-of-service	USFWS	U.S. Fish and Wildlife Service
CRHR	California Register of Historical Resources	MBTA	Migratory Bird Treaty Act		
CWA	Clean Water Act	Metro	Los Angeles County Metropolitan Transportation Authority		
dB	decibels	MOA	memorandum of agreement		
dB(A)	A-weighted decibels	MOU	memorandum of understanding		
EIR/EIS	Environmental Impact Report/Environmental Impact Statement	MRI	magnetic resonance imaging		

Table 2 Burbank to Los Angeles Project Section: Impact Avoidance and Minimization Features

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Air Quality and Global Climate Change										
AQ-IAMF#1	Fugitive Dust Emissions	<p>During construction, the Contractor shall employ the following measures to minimize and control fugitive dust emissions. The Contractor shall prepare a fugitive dust control plan for each distinct construction segment. At a minimum, the plan shall describe how each measure would be employed and identify an individual responsible for ensuring implementation. At a minimum, the plan shall address the following components unless alternative measures are approved by the applicable air quality management district.</p> <ul style="list-style-type: none"> ▪ Cover all vehicle loads transported on public roads to limit visible dust emissions, and maintain at least 6 inches of freeboard space from the top of the container or truck bed. ▪ Clean all trucks and equipment before exiting the construction site using an appropriate cleaning station that does not allow runoff to leave the site or mud to be carried on tires off the site. ▪ Water exposed surfaces and unpaved roads at a minimum three times daily with adequate volume to result in wetting of the top 1 inch of soil but avoiding overland flow. Rain events may result in adequate wetting of top 1 inch of soil thereby alleviating the need to manually apply water. ▪ Limit vehicle travel speed on unpaved roads to 15 miles per hour (mph). ▪ Suspend any dust-generating activities when average wind speed exceeds 25 mph. ▪ Stabilize all disturbed areas, including storage piles that are not being used on a daily basis for construction purposes, by using water, a chemical stabilizer/suppressant, hydro mulch or by covering with a tarp or other suitable cover or vegetative ground cover, to control fugitive dust emissions effectively. In areas adjacent to organic farms, the Authority would use non-chemical means of dust suppression. ▪ Stabilize all on-site unpaved roads and off-site unpaved access roads, using water or a chemical stabilizer/suppressant, to effectively control fugitive dust emissions. In areas adjacent to organic farms, the Authority would use non-chemical means of dust suppression. ▪ Carry out watering or presoaking for all land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities. 	Construction	Prepare plan/ Reporting	Weekly	Contractor	Contractor	Prepare a fugitive dust control plan	Condition of design-build contract	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #2: Compliance with Air Quality Plans</p> <p>Impact AQ #3: Greenhouse Gas Emissions during Construction</p> <p>Impact AQ #5: Localized Air Quality Impacts during Alignment Construction (NO₂ concentrations)</p> <p>Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction</p> <p>Impact BIO #1: Construction Effects on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Effects on Special-Status Wildlife Species</p> <p>Impact BIO #3 Construction Effects on Special-Status Natural Communities</p> <p>Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources</p> <p>Impact BIO #5: Construction Effects on Wildlife Movement</p> <p>Impact BIO #6: Construction Effects on Protected Trees</p> <p>Impact S&S #1: Accidents and Health Risks at Construction Sites</p> <p>Impact SOCIO #7: Temporary Disruption to Community Facilities from Construction</p> <p>Impact LU #1: Temporary Land Use Conversion and Incompatibility</p> <p>Impact PK #2: Air Quality, Noise, Vibration, and Visual Impacts during Construction</p> <p>Impact AVQ #1: Visual Disturbance during Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> For buildings up to 6 stories in height, wet all exterior surfaces of buildings during demolition. Limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at a minimum of once daily, using a vacuum type sweeper. After the addition of materials to or the removal of materials from surface or outdoor storage piles, apply sufficient water or a chemical stabilizer/suppressant. Require the construction contractor to post a publicly visible sign on the construction site with the telephone number and person to contact at the Authority for any dust or other air quality complaints. The person will be required to take corrective action within 48 hours. The phone number for the local air district must also be visible to ensure compliance with applicable regulations. Provisions in the dust control plan will allow school administrators and/or their designated representative(s) to notify the Authority if construction-related air emission levels generated by the project are adversely impacting the learning environment. All notices will be investigated by the Authority and corrective action will be taken within 48 hours. 								
AQ-IAMF#2	Selection of Coatings	<p>During construction, the Contractor shall use:</p> <ul style="list-style-type: none"> Low-volatile organic compound (VOC) paint that contains less than 10 percent of VOC contents (VOC, 10%). Super-compliant or Clean Air paint that has a lower VOC content than that required by San Joaquin Valley Unified Air Pollution Control District Rule 4601, Eastern Kern Air Pollution Control District Rule 410, and Antelope Valley Air Quality Management District Rule 1113, when available. If not available, the Contractor shall document lack of availability, recommend alternative measure(s) to comply with Rule 4601, 410, and 1113, or disclose absence of measure(s) for full compliance and obtain concurrence from the Authority. 	Construction	Low VOC-paint use	Monthly	Contractor	Contractor	Use of low-VOC paint during construction	Condition of design-build contract	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #2: Compliance with Air Quality Plans</p> <p>Impact AQ #3: Greenhouse Gas Emissions during Construction</p> <p>Impact AQ #5: Localized Air Quality Impacts during Alignment Construction (NO₂ concentrations)</p> <p>Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction</p> <p>Impact SOCIO #7: Temporary Disruption to Community Facilities from Construction</p> <p>Impact LU #1: Temporary Land Use Conversion and Incompatibility</p>
AQ-IAMF#3	Renewable Diesel	<p>During construction, the Contractor would use renewable diesel fuel to minimize and control exhaust emissions from all heavy-duty diesel-fueled construction diesel equipment and on-road diesel trucks. Renewable diesel must meet the most recent ASTM D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50% of diesel with the lowest carbon intensity among petroleum fuels sold in California. The Contractor would provide the Authority with monthly and annual reports, through the Environmental</p>	Construction	Renewable diesel fuel use	Monthly	Contractor	Contractor	Use of renewable diesel fuel during construction	Contract requirements and specifications	<p>Impact AQ #1: Regional Air Quality Impacts during Construction</p> <p>Impact AQ #2: Compliance with Air Quality Plans</p> <p>Impact AQ #3: Greenhouse Gas Emissions during Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		Mitigation Management and Application (EMMA) system, of renewable diesel purchase records and equipment and vehicle fuel consumption. Exemptions to use traditional diesel can be made where renewable diesel is not available from suppliers within 200 miles of the project site. The construction contract must identify the quantity of traditional diesel purchased and fully document the availability and price of renewable diesel to meet project demand.								Impact AQ #5: Localized Air Quality Impacts during Alignment Construction (NO ₂ concentrations) Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction
AQ-IAMF#4	Reduce Criteria Exhaust Emissions from Construction Equipment	<p>Prior to issuance of construction contracts, the Authority would incorporate the following construction equipment exhaust emissions requirements into the contract specifications:</p> <ol style="list-style-type: none"> 1. All heavy-duty off-road construction diesel equipment used during the construction phase would meet Tier 4 engine requirements. 2. A copy of each unit's certified tier specification and any required CARB or air pollution control district operating permit would be made available to the Authority at the time of mobilization of each piece of equipment. 3. The contractor would keep a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment. 4. The contractor would provide the Authority with monthly reports of equipment operating hours (through the Environmental Mitigation Management and Assessment [EMMA] system) and annual reports documenting compliance. 	Pre-construction	Contract specifications	Prior to construction	Authority	Authority	Exhaust emissions requirements incorporated into contract specifications	Contract requirements and specifications	Impact AQ #1: Regional Air Quality Impacts during Construction Impact AQ #2: Compliance with Air Quality Plans Impact AQ #3: Greenhouse Gas Emissions during Construction Impact AQ #5: Localized Air Quality Impacts during Alignment Construction (NO ₂ concentrations) Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction
AQ-IAMF#5	Reduce Criteria Exhaust Emissions from On-Road Construction Equipment	<p>Prior to issuance of construction contracts, the Authority would incorporate the following material hauling truck fleet mix requirements into the contract specifications:</p> <ol style="list-style-type: none"> 1. All on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, would consist of an average fleet mix of equipment model year 2010 or newer, but no less than the average fleet mix for the current calendar year as set forth in the CARB's EMFAC 2014 database. 2. The contractor would provide documentation to the Authority of efforts to secure such a fleet mix. 3. The contractor would keep a written record of equipment usage during project construction for each piece of equipment and provide the Authority with monthly reports of VMT (through EMMA) and annual reports documenting compliance. 	Pre-construction	Contract specifications	Prior to construction	Authority	Authority	Material hauling truck fleet mix requirements incorporated into contract specifications	Contract requirements and specifications	Impact AQ #1: Regional Air Quality Impacts during Construction Impact AQ #2: Compliance with Air Quality Plans Impact AQ #3: Greenhouse Gas Emissions during Construction Impact AQ #5: Localized Air Quality Impacts during Alignment Construction (NO ₂ concentrations) Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
AQ-IAMF#6	Reduce the Potential Impact of Concrete Batch Plants	Prior to construction of any concrete batch plant, the contractor would provide the Authority with a technical memorandum documenting consistency with the Authority's concrete batch plant siting criteria and utilization of typical control measures. Concrete batch plants would be sited at least 1,000 feet from sensitive receptors, including places such as daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant would implement typical control measures to reduce fugitive dust such as water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central dust collection systems, and other suitable technology, to reduce emissions to be equivalent to the USEPA AP-42 controlled emission factors for concrete batch plants. The contractor would provide to the Authority documentation that each batch plant meets this standard during operation.	Construction	Prepare plan/Reporting	Prior to construction of concrete batch plants	Contractor	Contractor	Preparation of a concrete batch plant technical memorandum	Contract requirements and specifications	Impact AQ #1: Regional Air Quality Impacts during Construction Impact AQ #2: Compliance with Air Quality Plans Impact AQ #3: Greenhouse Gas Emissions during Construction Impact AQ #5: Localized Air Quality Impacts during Alignment Construction (NO ₂ concentrations) Impact AQ #6: Localized Air Quality Impacts on School Children and Other Sensitive Receptors during Construction
Noise and Vibration										
NV-IAMF#1	Noise and Vibration	Prior to construction, the contractor shall prepare and submit to the Authority a noise and vibration technical memorandum documenting how the FTA and FRA guidelines for minimizing construction noise and vibration impacts would be employed when work is being conducted within 1,000 feet of sensitive receptors. Typical construction practices contained in the FTA and FRA guidelines for minimizing construction noise and vibration impacts include the following: <ul style="list-style-type: none"> Construct sound barriers, such as temporary walls or piles on excavated material, between noisy activities and noise sensitive resources. Route truck traffic away from residential streets, when possible. Construct walled enclosures around especially noisy activities or around clusters or noise equipment. Combine noisy operations so that they occur in the same period. Phase demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period. Avoid impact pile driving where possible in vibration sensitive areas. 	Pre-construction/Construction	Prepare technical memorandum/Compliance reporting	Monthly	Contractor	Contractor	Prepare a construction noise and vibration technical memorandum	Condition of design-build contract	Impact N&V #1: Temporary Exposure of Sensitive Receivers to Construction Noise Impact N&V #2: Temporary Exposure of Sensitive Receivers to Vibration from Construction Impact SOCIO #14: Temporary Impacts on Children's Health and Safety from Construction Impact PK #2: Air Quality, Noise, Vibration, and Visual Impacts during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Electromagnetic Interference and Electromagnetic Fields										
EMI/EMF-IAMF#1	Preventing Interference with Adjacent Railroads	<p><i>Technical Memorandum 3.00.10. Implementation Stage Electromagnetic Compatibility Program Plan</i> requires coordination with adjacent railroads. During Project Design, the Contractor would work with the engineering departments of railroads that operate parallel the HSR system to apply standard design practices to prevent interference with the electronic equipment operated by these railroads. Prior to Operation and Maintenance of each operating segment, the Contractor shall certify through issuance of a technical memorandum to the Authority that design provisions to prevent interference have been established and have been determined to be effective prior to the activation of potentially interfering systems of the HSR.</p> <p>The contractor would work with the railroad engineering departments where these railways parallel the HSR to apply the standard design practices to prevent interference with the electronic equipment operated by these railroads. Design provisions to prevent interference would be put in place and determined to be adequately effective by a qualified electrical engineering professional prior to the HSR activation of potentially interfering systems. The Authority's Design Criteria Manual Chapter 26 summarizes the applicable EMI/EMF design standards that the Authority would use for the project.</p>	Design/ Construction	Prepare technical memorandum/ Compliance reporting	Monthly	Contractor	Contractor/ Authority	Prepare electromagnetic compatibility technical memorandum	Condition of design-build contract	Impact EMI/EMF #10: Effects on Adjacent Existing Rail Lines
EMI/EMF-IAMF#2	Controlling Electromagnetic Fields/ Electromagnetic Interference	<p>Prior to construction, the contractor would prepare an EMI/EMF technical memorandum for review and approval by the Authority. The California HSR project shall adhere to international guidelines and comply with applicable federal and state laws and regulations. The HSR project design would follow Technical Memorandum 300.10, Implementation Stage Electromagnetic Compatibility Program Plan, the HSR Design Criteria Manual Chapter 26, which provides detailed electromagnetic compatibility (EMC) design criteria for the HSR systems and equipment, and HSR Design Criteria Manual Chapter 22, which addresses grounding requirements for third-party metallic structures, including fences and pipelines, which are parallel and adjacent to the California HSR System right-of-way. These documents describe the design practices to avoid EMI and to provide for HSR operational safety. Some measures of the ISEP include:</p> <ul style="list-style-type: none"> ▪ During the planning stage through system design, the Authority would perform EMC/EMI safety analyses, which would include identification of existing nearby radio systems, design of systems to prevent EMI with identified neighboring uses, and incorporation of these design requirements into bid specifications used to procure radio systems. ▪ Pipelines and other linear metallic objects that are not sufficiently grounded through the direct contact with earth 	Design/ Construction	Prepare technical memorandum/ Compliance reporting	Monthly	Contractor	Contractor/ Authority	Prepare EMI/EMF technical memorandum	Condition of design-build contract	Impact EMI/EMF #1: Temporary Impacts from Use of Heavy Construction Equipment Impact EMI/EMF #3: Temporary Impacts from Operation of Electrical Equipment Impact EMI/EMF #4: Permanent Human Exposure to EMF Impact EMI/EMF #5: People with Implanted Medical Devices and Exposure to EMF Impact EMI/EMF #6: Interference with Sensitive Equipment Impact EMI/EMF #7: EMI effects on Schools Impact EMI/EMF #8: Potential for Corrosion of Underground Pipelines and Cables, and Adjoining Rail Impact EMI/EMF #9: Potential for Nuisance Shocks Impact EMI/EMF #11: Effects Related to Adjacent Airports

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		<p>would be separately grounded in coordination with the affected owner or utility to avoid possible shock hazards. For cases where metallic fences are purposely electrified to inhibit livestock or wildlife from traversing the barrier, specific insulation design measures would be implemented.</p> <ul style="list-style-type: none"> ▪ HSR standard corrosion protection measures would be implemented to eliminate risk of substantial corrosion of nearby metal objects. 								
Public Utilities and Energy										
PUE-IAMF#1	Design Measures	The HSR project design incorporates utilities and design elements that minimize electricity consumption (e.g., using regenerative braking, energy-saving equipment on rolling stock and at station facilities, implementing energy saving measures during construction, and automatic train operations to maximize energy efficiency during operations). Thus, the project would not overburden utility services. The design elements are included in the design-build contract. Additionally, the Authority has adopted a sustainability policy that establishes project design and construction requirements that avoid and minimize impacts.	Design/ Construction	Reporting	At incorporation or completion of design/monthly reporting (during construction)	Contractor	Contractor	Incorporation of utilities and design elements that minimize electrical consumption into design	Condition of design-build contract	Impact PU&E #9: Construction Energy Consumption Impact PU&E #16: Operational Energy Demand
PUE-IAMF#3	Public Notifications	Prior to construction in areas where utility service interruptions are unavoidable, the Contractor would notify the public through a combination of communication media (e.g., by phone, email, mail, newspaper notices, or other means) within that jurisdiction and the affected service providers of the planned outage. The notification would specify the estimated duration of the planned outage and would be published no fewer than 7 days prior to the outage. Construction would be coordinated to avoid interruptions of utility service to hospitals and other critical users. The Contractor would submit the public communication plan to the Authority 60 days in advance of the work for verification that appropriate messaging and notification are to be provided.	Pre-construction/ Construction	Public notification	Monthly	Contractor	Contractor	Public notification of utility service interruptions 60 days in advance of work for verification	Condition of design-build contract	Impact PU&E #1: Temporary Interruption of Utility Service
PUE-IAMF#4	Utilities and Energy	Prior to construction, the Contractor shall prepare a technical memorandum documenting how construction activities would be coordinated with service providers to minimize or avoid interruptions. It would include upgrades of existing power lines to connect the HSR system to existing utility substations. The technical memorandum shall be provided to the Authority for review and approval.	Design/ Pre-construction	Prepare a technical memorandum	At incorporation or completion of design/monthly reporting (during construction)	Contractor	Contractor	Prepare service provider coordination technical memorandum	Condition of design-build contract	Impact PU&E #1: Temporary Interruption of Utility Service Impact PU&E #2: Accidents and Disruption of Services Impact PU&E #3: Conflicts with Existing Utilities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Biological and Aquatic Resources										
BIO-IAMF#1	Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors	<p>At least 15 business days prior to commencement of any ground-disturbing activity (including but not limited to geotechnical investigations, utility realignments, creation of staging areas, or initial clearing and grubbing), the Authority will submit the name(s) and qualifications of project biologists, designated biologists, species-specific biological monitors, and general biological monitors retained to conduct biological resource monitoring activities and implement avoidance and minimization measures.</p> <p>No ground-disturbing activity would begin until the Authority has received written approval from the USFWS, the NMFS, where applicable, and the CDFW that the biologists and monitors have been approved to conduct the specified work. The project biologist is responsible for ensuring the timely implementation of the biological avoidance and minimization measures, as outlined in the Biological Resources Management Plan (BRMP), and for guiding and directing the work of the designated biologists and Biological Monitors. Designated biologists will be responsible for directly overseeing and reporting the implementation of general and species-specific conservation measures. In some instances, designated biologists will only be approved for specific species, in which case they will only be authorized to conduct surveys and implement measures for the species for which they have been approved. Species-specific biological monitors will be responsible for implementation of species-specific measures for the species for which they have been approved and will report directly to a designated biologist. General biological monitors will report directly to a designated biologist or to the project biologist. General biological monitors will be responsible for conducting Worker Environmental Awareness Program (WEAP) training, implementing general conservation measures, conducting general compliance monitoring, and reporting on compliance monitoring activities.</p> <p>The term "project biologist" is used in these IAMFs to mean the project biologist, designated biologists, species-specific biological monitors, and general biological monitors, as appropriate. When the Authority is specified as implementing an IAMF, it is assumed that the Authority, or its contractor or agent, is implementing the IAMF under the supervision of biologists and biological monitors, as appropriate.</p>	Pre-construction	Compliance reporting	15-days prior to ground disturbance	Authority	Authority	Submit names of biologists and monitors to regulatory agencies	EMMA	<p>Impact BIO #1: Construction Effects on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Effects on Special-Status Wildlife Species</p> <p>Impact BIO #3 Construction Effects on Special-Status Natural Communities</p> <p>Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources</p> <p>Impact BIO #5: Construction Effects on Wildlife Movement</p> <p>Impact BIO #6: Construction Effects on Protected Trees</p>

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BIO-IAMF#2	Facilitate Agency Access	Throughout the construction period, the Authority will allow access by the USFWS, NMFS, U.S. Army Corps of Engineers (USACE), CDFW, and State Water Resources Control Board (SWRCB) to the project site. Because of safety concerns, all visitors will check in with the Authority's resident engineer prior to entering the project footprint. In the event that agency personnel visit the project footprint, the Project Biologist will prepare a memorandum within 3 business days after the visit documenting the issues raised during the field meeting. The Project Biologist will report any issues regarding regulatory compliance raised by agency personnel to the Authority.	Construction	Compliance reporting	3 days after regulatory agency site visit	Contractor	Contractor	Prepare memorandum documenting agency site visit	Condition of design-build contract	Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources
BIO-IAMF#3	Prepare Worker Environmental Awareness Program (WEAP) Training Materials and Conduct Construction Period WEAP Training	<p>Prior to any ground-disturbing activity, the project biologist will prepare a WEAP for the purpose of training construction crews to recognize and identify sensitive biological resources that may be encountered in the project vicinity. The WEAP training materials will be submitted to the Authority for review and approval. A video of the WEAP training prepared and presented by the project biologist and approved by the Authority may be used if the project biologist is not available to present the training in person.</p> <p>At a minimum, WEAP training materials will include the following information: key provisions of FESA, CESA, the Bald and Golden Eagle Protection Act (BGEPA), the MBTA, Cal. Fish and Game Code 1600, Porter-Cologne, and the CWA; the consequences and penalties for violation of or noncompliance with these laws, regulations, and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities, and explanations about their ecological value; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of avoidance, minimization, and mitigation measures.</p> <p>The project biologist will present WEAP training to all construction personnel before they work in the project footprint. As part of the WEAP training, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures. Crews will be informed during the WEAP training that, except when necessary as determined in consultation with the project biologist, travel within the project footprint is restricted to established roadbeds, which include all pre-existing and project-constructed unimproved and improved roads. A fact sheet conveying this information will be prepared by the project biologist for distribution to the construction crews and others who enter the project footprint. Fact sheet information will be duplicated in a wallet-sized format and will be provided in other languages as necessary to accommodate non-English-speaking workers. All construction staff will attend the</p>	Pre-construction	Training program/ Reporting	Annual (training)/ Monthly (reporting)	Contractor/ Authority	Contractor/ Authority	Prepare WEAP/Annual (training)/ monthly (reporting)	WEAP	<p>Impact BIO #1: Construction Effects on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Effects on Special-Status Wildlife Species</p> <p>Impact BIO #3 Construction Effects on Special-Status Natural Communities</p> <p>Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources</p> <p>Impact BIO #5: Construction Effects on Wildlife Movement</p> <p>Impact BIO #6: Construction Effects on Protected Trees</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>WEAP training prior to beginning work on-site and will attend the WEAP training on an annual basis thereafter.</p> <p>Upon completion of the WEAP training, each member of the construction crew will sign a form stating that they attended the training, understand the information presented, and agree to comply with the requirements set out in the WEAP training. The project biologist will submit the signed WEAP training forms to the Authority on a monthly basis. On an annual basis, the Authority will certify that WEAP training has been provided to all construction personnel. On a monthly basis, the project biologist will provide updates relevant to the training to construction personnel during the daily safety ("tailgate") meeting.</p>								
BIO-IAMF#4	Conduct Operation and Maintenance Period Worker Environmental Awareness Program (WEAP) Training	<p>Prior to initiating operation and maintenance (O&M) activities, O&M personnel will attend a WEAP training session arranged by the Authority.</p> <p>At a minimum, O&M WEAP training materials will include the following information: key provisions of FESA, CESA, the BGEPA, the MBTA, Porter-Cologne, and the CWA; the consequences and penalties for violation of/noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; and the contact person in the event of the discovery of a dead or injured wildlife species. The training will include an overview of provisions of the biological resources management plan, annual vegetation, and management plan, weed control plan, and security fencing and wildlife exclusion fencing maintenance plans pertinent to O&M activities. A fact sheet prepared by the Authority's environmental compliance staff will be prepared for distribution to the O&M employees. The training will be provided by the Authority's environmental compliance staff. The training sessions will be provided to employees prior to their involvement in any O&M activity and will be repeated for all O&M employees on an annual basis. Upon completion of the WEAP training, O&M employees will, in writing, verify their attendance at the training sessions and confirm their willingness to comply with the requirements set out in those sessions.</p>	Post-construction	Training program/ Reporting	Annual	Contractor/ Authority	Contractor/ Authority	WEAP Training/Annual reporting	WEAP	<p>Impact BIO #7: Operation Effects on Special-Status Plant Species</p> <p>Impact BIO #9: Operations Effects on Special-Status Natural Communities</p> <p>Impact BIO #11: Operations Effects on Wildlife Movement</p> <p>Impact BIO #12: Operations Effects on Protected Trees</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
BIO-IAMF#5	Prepare and Implement a Biological Resources Management Plan	<p>Prior to any ground-disturbing activity, the project biologist will prepare the BRMP, which would include a compilation of the biological resources avoidance and minimization measures applicable to the HSR section. All project environmental plans, such as the Restoration and Revegetation Plan (RPP) and Weed Control Plan (WCP), will be included as appendices to the BRMP. The BRMP is intended to serve as a comprehensive document that sets out the range of avoidance and minimization measures to support the appropriate and timely implementation of those measures. The implementation of these measures will be tracked through the final design, construction, and operation phases. The BRMP will contain, but not be limited to, the following information:</p> <ul style="list-style-type: none"> ▪ A master schedule that shows construction of the project, pre-construction surveys, and establishment of buffers and exclusions zones to protect sensitive biological resources. ▪ Specific measures for the protection of special-status species. ▪ Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, along with the locations where habitats are to be restored. ▪ Identification of agency-approved project biologists(s) and biological monitors(s), including those responsible for notification and report of injury or death of federally or State-listed species. ▪ Measures to preserve topsoil and control erosion. ▪ Design of protective fencing around environmentally sensitive areas (ESA) and the construction staging areas. ▪ Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees. ▪ Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within sensitive habitat areas. ▪ Specific measures for the protection of vernal pool habitat and riparian areas. These measures may include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements. 	Pre-construction	Prepare plan	Prior to any ground-disturbing activity	Contractor	Contractor	Prepare BRMP	USFWS, USACE, SWRCB, and CDFW permits	<p>Impact BIO #1: Construction Effects on Special-Status Plant Species</p> <p>Impact BIO #2: Construction Effects on Special-Status Wildlife Species</p> <p>Impact BIO #3 Construction Effects on Special-Status Natural Communities</p> <p>Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources</p> <p>Impact BIO #5: Construction Effects on Wildlife Movement</p> <p>Impact BIO #6: Construction Effects on Protected Trees</p> <p>Impact BIO #7: Operations Effects on Special-Status Plant Species</p> <p>Impact BIO #9: Operations Effects on Special-Status Natural Communities</p> <p>Impact BIO #10: Operations Effects on Wetlands and Other Aquatic Resources</p> <p>Impact BIO #11: Operations Effects on Wildlife Movement</p> <p>Impact BIO #12: Operations Effects on Protected Trees</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures. The monitoring will: (1) identify specific locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s); (4) identify the reporting requirements; and (5) provide an accounting of impacts to special-status species habitat compared to pre-construction impact estimates. <p>The BRMP will be submitted to the Authority for review and approval prior to any ground-disturbing activity.</p>								
BIO-IAMF#6	Establish Monofilament Restrictions	<p>Prior to any ground-disturbing activity, the project biologist will verify that plastic monofilament netting (erosion control matting) or similar material is not being used as part of erosion control activities. The project biologist will identify acceptable material for such use, including: geomembranes, coconut coir matting, tackified hydroseeding compounds, and rice straw wattles (e.g., Earthsaver™ wattles: biodegradable, photodegradable, burlap). Within developed or urban areas, the project biologist may allow exceptions to the restrictions on the type of erosion control material if the project biologist determines that the construction area is of sufficient distance from natural areas to ensure the avoidance of potential impacts on wildlife.</p>	Pre-construction	Compliance reporting	Prior to any ground-disturbing activity	Contractor	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO #5: Construction Effects on Wildlife Movement
BIO-IAMF#7	Prevent Entrapment in Construction Materials and Excavations	<p>At the end of each work day during construction, the Authority will cover all excavated, steep-sided holes or trenches more than 8 inches deep and that have sidewalls steeper than 1:1 (45-degree) slope with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than 3:1) constructed of earth fill or wooden planks. The Project Biologist will thoroughly inspect holes and trenches for trapped animals at the start and end of each work day.</p> <p>The Authority will screen, cover, or elevate at least 1 foot above ground all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored overnight within the project footprint. These pipes, culverts, and similar structures will be inspected by the Project Biologist for wildlife before such material is moved, buried, or capped.</p>	Construction	Monitoring/ Compliance reporting	Daily monitoring/ Monthly reporting	Contractor	Contractor	Daily monitoring/ monthly reporting	Condition of design-build contract	Impact BIO #5: Construction Effects on Wildlife Movement

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
BIO-IAMF#8	Delineate Equipment Staging Areas and Traffic Routes	Prior to any ground-disturbing activity, the Authority will establish staging areas for construction equipment in areas that minimize effects on sensitive biological resources, including habitat for special-status species, seasonal wetlands, and wildlife movement corridors. Staging areas (including any temporary material storage areas) will be located in areas that would be occupied by permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. The Authority will flag and mark access routes to ensure that vehicle traffic within the project footprint is restricted to established roads, construction areas, and other designated areas.	Pre-construction	Compliance reporting	Prior to any ground-disturbing activity	Contractor	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #3 Construction Effects on Special-Status Natural Communities Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #5: Construction Effects on Wildlife Movement Impact BIO #6: Construction Effects on Protected Trees
BIO-IAMF#9	Dispose of Construction Spoils and Waste	During ground-disturbing activities, the Authority may temporarily store excavated materials produced by construction activities in areas at or near construction sites within the project footprint. Where practicable, the Authority will return excavated soil to its original location to be used as backfill. Any excavated waste materials unsuitable for treatment and reuse will be disposed at an off-site location, in conformance with applicable State and federal laws.	Construction	Compliance reporting	Monthly	Authority	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO #3 Construction Effects on Special-Status Natural Communities Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #5: Construction Effects on Wildlife Movement Impact BIO #6: Construction Effects on Protected Trees Impact HWR #3: Temporary Impacts on Surface Water Quality during Construction
BIO-IAMF#10	Clean Construction Equipment	Prior to any ground-disturbing activity, the Authority will ensure that all equipment entering the Work Area is free of mud and plant materials. The Authority will establish vehicle cleaning locations designed to isolate and contain organic materials and minimize opportunities for weeds and invasive species to move in and out of the project footprint. Cleaning may be done by washing with water, blowing with compressed air, brushing, or other hand cleaning. The cleaning areas will be located so as to avoid impacts on surface waters and appropriate Stormwater Pollution Prevention Plan (SWPPP) best management practices (BMP) will be implemented so as to further control any potential for the spread of weeds or other invasive species. Cleaning stations will be inspected regularly (at least monthly).	Pre-construction	Compliance reporting	Prior to any ground-disturbing activity, monthly reporting	Authority	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO #3 Construction Effects on Special-Status Natural Communities Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #6: Construction Effects on Protected Trees

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
BIO-IAMF#11	Maintain Construction Sites	<p>Prior to any ground-disturbing activity, the Authority will prepare a construction site BMP field manual. The manual will contain standard construction site housekeeping practices required to be implemented by construction personnel. The manual will identify BMPs for the following topics: temporary soil stabilization, temporary sediment control, wind erosion control, non-stormwater management, waste management and materials control, rodenticide use, and other general construction site cleanliness measures.</p> <p>All construction personnel will receive training on BMP field manual implementation prior to working within the project footprint. All personnel will acknowledge, in writing, their understanding of the BMP field manual implementation requirements. The BMP field manual will be updated by January 31 of each year. The Authority will provide, on an annual basis, training updates to all construction personnel.</p>	Pre-construction	Reporting	Prior to any ground-disturbing activity, annual reporting	Authority	Contractor	Monthly reporting	Condition of design-build contract	Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #3 Construction Effects on Special-Status Natural Communities Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #5: Construction Effects on Wildlife Movement Impact BIO #6: Construction Effects on Protected Trees Impact HWR #1: Temporary Impacts on Drainage Patterns, Stormwater Runoff, and Hydraulic Capacity (Surface Water Hydrology) during Construction Impact HWR #3: Temporary Impacts on Surface Water Quality during Construction
BIO-IAMF#12	Design the Project to be Bird Safe	<p>Prior to final construction design, the Authority will ensure that the catenary system, masts, and other structures such as fencing are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in <i>Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006)</i> and <i>Reducing Avian Collisions with Power Lines: State of the Art in 2012 (APLIC 2012)</i>, including recommendations made by the Authority's Bird Electrocutation Avoidance Configuration Working Group. Applicable APLIC recommendations include, but are not limited to:</p> <ul style="list-style-type: none"> ▪ Ensuring sufficient spacing of phase conductors to prevent bird electrocution ▪ Configuring lines to reduce vertical spread of lines and/or decreasing the span length if such options are feasible ▪ Marking lines to increase the visibility of lines and reduce the potential for collision ▪ Installing perch deterrents to discourage bird presence near project facilities 	Pre-construction	Design	Prior to final design	Authority	Authority	Bird and raptor-safe design catenary system, masts, and other structures such as fencing	Condition of design-build contract	Impact BIO#8 Operation Effects on Special-Status Wildlife

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Hydrology and Water Resources										
HYD-IAMF#1	Storm and Ground Water Management	Prior to construction, the contractor shall prepare a storm and groundwater management and treatment plan for review and approval by the Authority. During the detailed design phase, each receiving storm and groundwater system's capacity to accommodate project runoff would be evaluated. As necessary, on-site storm and groundwater management measures, such as detention or selected upgrades to the receiving system, would be designed to provide adequate capacity and to comply with the design standards in the latest version of Authority Technical Memorandum 2.6.5 <i>Hydraulics and Hydrology Guidelines</i> . On-site storm and groundwater management facilities would be designed and constructed to capture runoff and provide treatment prior to discharge of pollutant-generating surfaces, including tunnels, trenches, station parking areas, access roads, new road over- and underpasses, reconstructed interchanges, and new or relocated roads and highways. Low-impact development techniques would be used to detain runoff on site and to reduce off site runoff such as constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips, would be used where appropriate.	Design	Prepare plan	At incorporation or completion of design	Contractor	Contractor	Prepare a stormwater management and treatment plan	Condition of design-build contract	Impact HWR #2: Permanent Impacts on Drainage Patterns, Stormwater Runoff, and Hydraulic Capacity (Surface Water Hydrology) during Construction Impact HWR #4: Permanent Impacts on Surface Water Quality during Construction Impact HWR #6: Permanent Impacts on Groundwater Volume, Quality, and Recharge during Construction Impact HWR #10: Intermittent Continuous Permanent Surface Water Quality during Operations Impact HWR #11: Intermittent and Continuous Permanent Impacts on Groundwater Volume, Quality, and Recharge during Operations Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #3 Construction Effects on Special-Status Natural Communities Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #6: Construction Effects on Protected Trees Impact BIO #10: Operation Effects on Wetlands and Other Aquatic Resources Impact PU&E #13: Effects on Storm Drain Facilities during Operation
HYD-IAMF#2	Flood Protection	Prior to construction, the contractor shall prepare a flood protection plan for Authority review and approval. The project would be designed both to remain operational during flood events and to minimize increases in 100-year or 200-year flood elevations, as applicable to locale. Design standards will include the following: <ul style="list-style-type: none"> Establish track elevation to prevent saturation and infiltration of stormwater into the sub-ballast. Minimize development within the floodplain, to such an extent that water surface elevation in the floodplain would not increase by more than 1 foot, or as required by state or local agencies, during the 100-year or 200-year flood flow [as applicable to locale]. Avoid placement of facilities in the floodplain or raise the ground with fill above the base-flood elevation. 	Design	Prepare plan	At incorporation or completion of design	Contractor	Contractor	Prepare flood protection plan	Condition of design-build contract	Impact HWR#2: Permanent Impacts on Drainage Patterns, Stormwater Runoff, and Hydraulic Capacity (Surface Water Hydrology) during Construction Impact HWR#8: Permanent Impact on Floodplains during Construction Impact PU&E #13: Effects on Storm Drain Facilities during Operation Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO#2: Construction Effects on Special-Status Wildlife Species Impact BIO #3: Construction Effects on Special-Status Plant Communities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> Design the floodplain crossings to maintain a 100-year floodwater surface elevation of no greater than 1 foot above current levels, or as required by state or local agencies, and project features within the floodway itself would not increase existing 100-year floodwater surface elevations in Federal Emergency Management Agency-designated floodways, or as otherwise agreed upon with the county floodplains manager. <p>The following design standards would minimize the effects of pier placement on floodplains and floodways:</p> <ul style="list-style-type: none"> Design site crossings to be as nearly perpendicular to the channel as feasible to minimize bridge length. Orient piers to be parallel to the expected high-water flow direction to minimize flow disturbance. Elevate bridge crossings at least 3 feet above the high-water surface elevation to provide adequate clearance for floating debris, or as required by local agencies. Conduct engineering analyses of channel scour depths at each crossing to evaluate the depth for burying the bridge piers and abutments. Implement scour-control measures to reduce erosion potential. Use quarry stone, cobblestone, or their equivalent for erosion control along rivers and streams, complimented with native riparian plantings or other natural stabilization alternatives that would restore and maintain a natural riparian corridor. Place bedding materials under the stone protection at locations where the underlying soils require stabilization as a result of stream flow velocity. 								Impact BIO #4: Construction Effects on Aquatic Resources Impact BIO #5: Construction Effects on Wildlife Movement Impact BIO #6: Construction Effects on Protected Trees Impact BIO #7: Operational Effects on Special-Status Plant Species Impact BIO #8: Operational Effects on Special-Status Wildlife Species Impact BIO #9: Operation Effects on Special-Status Plant Communities Impact BIO #10: Operation Effects on Aquatic Resources Impact BIO #11: Operation Effects on Wildlife Movement Impact BIO #12: Operation Effects on Protected Trees Impact S&S #16: Hazards to High-Speed Rail Passengers and Employees from Extreme Weather Conditions
HYD-IAMF#3	Prepare and Implement a Construction Stormwater Pollution Prevention Plan	Although the project is not required to obtain coverage under the SWRCB Construction General Permit, prior to construction (any ground-disturbing activities), the contractor shall comply with the SWRCB Construction General Permit requiring preparation and implementation of a SWPPP. The Construction SWPPP would propose BMPs to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs would include measures to incorporate permeable surfaces into facility design plans where feasible, and how treated stormwater would be retained or detained on site. Other BMPs shall include strategies to manage the amount and quality of overall stormwater runoff. The Construction SWPPP would include measures to address, but are not limited to, the following: <ul style="list-style-type: none"> Hydromodification management to verify maintenance of pre-project hydrology by emphasizing on-site retention of 	Pre-construction/ Construction	Permit compliance	At incorporation or completion of design/during monthly construction report	Contractor	Contractor	Prepare construction SWPPP	Condition of design-build contract	Impact HWR #1: Temporary Impacts on Drainage Patterns, Stormwater Runoff, and Hydraulic Capacity (Surface Water Hydrology) during Construction Impact HWR #3: Temporary Impacts on Surface Water Quality during Construction Impact HWR #5: Temporary Impacts on Groundwater Volume, Quality, and Recharge during Construction Impact HWR #7: Temporary Impact on Floodplains during Construction Impact PU&E #5: Effects on Stormwater Infrastructure during Construction Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO #3 Construction Effects on Special-Status Natural Communities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>stormwater runoff using measures such as flow dispersion, infiltration, and evaporation (supplemented by detention where required). Additional flow control measures would be implemented where local regulations or drainage requirements dictate.</p> <ul style="list-style-type: none"> ▪ Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater. ▪ Limiting fueling and other activities using hazardous materials to areas distant from surface water, providing drip pans under equipment, and daily checks for vehicle condition. ▪ Implementing practices to reduce erosion of exposed soil, including soil stabilization, regular watering for dust control, perimeter siltation fences, and sediment catchment basins. ▪ Implementing practices to maintain current water quality, including siltation fencing, wattle barriers, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, storage tanks, and sediment traps to arrest and settle sediment. ▪ Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes. ▪ Using diversion ditches to intercept surface runoff from off-site. ▪ Where feasible, limiting construction to dry periods when flows in waterbodies are low or absent. ▪ Implementing practices to capture and provide proper off-site disposal of concrete wash water, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatments (e.g., dry ice). ▪ Developing and implementing a spill prevention and emergency response plan to handle potential fuel and/or hazardous material spills. <p>Implementation of a SWPPP would be performed by the construction contractor as directed by the contractor's Qualified SWPPP Practitioner or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before, during and after storm events. Records of these inspections and monitoring results will be maintained by the construction contractor.</p>								<p>Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources</p> <p>Impact BIO #6: Construction Effects on Protected Trees</p> <p>Impact HMW #2: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions That Involve the Release of Hazardous Materials during Construction</p> <p>Impact GSSPR #6: Soil Erosion during Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Geologic, Soils, Seismicity, and Paleontological Resources										
GEO-IAMF#1	Geologic Hazards	<p>Prior to construction, the Contractor shall prepare a Construction Management Plan (CMP) addressing how the Contractor would address geologic constraints and minimize or avoid impacts on geologic hazards during construction. The plan would be submitted to the Authority for review and approval. At a minimum, the plan would address the following geological and geotechnical constraints/resources:</p> <ul style="list-style-type: none"> a. Groundwater Withdrawal — Controlling the amount of groundwater withdrawal from the project, by re-injecting groundwater at specific locations if necessary, or using alternate foundation designs to offset the potential for settlement. This control is important for locations with retained cuts in areas where high groundwater exists, and where existing buildings are located near the depressed track section. b. Unstable Soils — Employing various methods to mitigate for the risk of ground failure from unstable soils. If soft or loose soils are encountered at shallow depths, they can be excavated and replaced with competent soils. To limit the excavation depth, replacement materials can also be strengthened using geosynthetics. Where unsuitable soils are deeper, ground improvement methods, such as stone columns, cement deep-soil-mixing, or jet-grouting, can be used. Alternatively, if sufficient construction time is available, preloading—in combination with prefabricated vertical drains (wicks) and staged construction—can be used to gradually improve the strength of the soil without causing bearing-capacity failures. c. Subsidence — The Authority addresses subsidence in its design and construction processes. For the initial design, survey monuments were installed to establish a datum and set an initial track profile. In the construction phase, the design-build contractors for track bed preparation would conduct topographic surveys for preparation of final design. Because subsidence could have occurred since the original benchmarks (survey monuments) were established, the design-build contractor’s topographic surveys would be used to help determine whether subsidence has occurred. The updated topographic surveys would also be used to establish the top of rail elevations for final design where the HSR system is outside established floodplain areas and above water surface elevations. Where the HSR system is in floodplain areas susceptible to flooding, consideration would be given to overbuild the height of the rail bed in anticipation of future subsidence. d. Water and Wind Erosion — The Contractor would implement erosion control methods as appropriate from the various erosion control methods documented in the Construction SWPPP (See HYD-IAMF#3), the Caltrans 	Design/ Construction	Prepare plan	At incorporation or completion of design/during monthly construction report	Contractor	Contractor	Prepare Construction Management Plan (CMP)	Condition of design-build contract	<p>Impact GSSPR #1: Surface Fault Rupture during Construction</p> <p>Impact GSSPR #2: Seismic Ground Shaking during Construction</p> <p>Impact GSSPR #3: Liquefaction and Other Types of Seismically Induced Ground Failure during Construction</p> <p>Impact GSSPR #5: Seismically Induced Slope Failure Hazards Associated with Landslides and Cut-and-Fill Slopes during Construction</p> <p>Impact GSSPR #6: Soil Erosion during Construction</p> <p>Impact GSSPR #7: Unstable or Collapsible Soils during Construction</p> <p>Impact GSSPR #9: Difficult Excavation Related to Encountering Cobbles or Boulders during Construction</p> <p>Impact GSSPR #10: Soil Corrosion and Expansion during Construction</p> <p>Impact GSSPR #11: Availability of Mineral Resources during Construction</p> <p>Impact GSSPR #13: Geologic Units Sensitive to Paleontological Resources during Construction</p> <p>Impact GSSPR #16: Liquefaction and Other Types of Seismically Induced Ground Failure during Operation</p> <p>Impact GSSPR #20: Unstable or Collapsible Soils During Operation</p> <p>Impact GSSPR #21: Ground Subsidence during Operation</p> <p>Impact GSSPR #23: Soil Corrosion and Expansion Hazards during Operation</p> <p>Impact HWR #5: Temporary Impacts on Groundwater Volume, Quality, and Recharge during Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>Construction Manuals, and the construction technical memorandum (see GEO-IAMF#6), and in coordination with other erosion, sediment, stormwater management and fugitive dust control efforts. Water and wind erosion control methods may include, but are not limited to, use of revegetation, stabilizers, mulches, and biodegradable geotextiles.</p> <p>e. Soils with Shrink-Swell Potential — In locations where shrink-swell potential is marginally unacceptable, soil additives would be mixed with existing soil to reduce the shrink-swell potential. Construction specifications would be based upon the decision whether to remove or treat the soil. This decision is based on the soils, specific shrink-swell characteristics, the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil.</p> <p>f. Soils with Corrosive Potential — In locations where soils have a potential to be corrosive to steel and concrete, the soils would be removed and buried structures would be designed for corrosive conditions, and corrosion-protected materials would be used in infrastructure.</p> <p>g. Health and Safety Plan. Contractor shall be responsible for developing and deploying a health and safety plan. The plan will include weekly monitoring requirements and response protocols for exposure of personnel to constituents of concern identified in the Phase II Environmental Site Assessment(s).</p>								
GEO-IAMF#2	Slope Monitoring	During O&M, the Authority shall incorporate slope monitoring by a Registered Engineering Geologist into the Operations and Maintenance procedures. The procedures shall be implemented at sites identified in the Construction Management Plan (CMP) where a potential for long-term instability exists from gravity or seismic loading including but not limited to at-grade sections where slope failure could result in loss of track support or where slope failure could result in additional earth loading to foundations supporting elevated structures.	Operation	Prepare plan/ Monitoring	Monthly during operation	Authority	Contractor	Slope monitoring during operation	Condition of design-build contract	Impact GSSPR #16: Liquefaction and Other Types of Seismically Induced Ground Failure during Operation Impact GSSPR #18: Seismically Induced Slope Failure Hazards Associated with Landslides and Cut-and-Fill Slopes during Operation
GEO-IAMF#3	Gas Monitoring	Prior to Construction, the Contractor shall prepare a CMP addressing how gas monitoring would be incorporated into construction best management practices. The CMP would be submitted to the Authority for review and approval. Hazards related to potential migration of hazardous gases due to the presence of known oil and gas fields, areas of active or historic landfills, Superfund site, or other subsurface sources can be reduced or eliminated by following strict federal and state Occupational Safety & Health Administration (OSHA/Cal-OSHA) regulatory requirements for excavations, and by consulting with other agencies as appropriate, such as the Department of Conservation (Division of Oil and Gas) and the California Environmental Protection Agency, Department	Design/ Construction	Prepare plan/ Design	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Impact HMW #6: Risks during Construction on or near Landfills and Oil and Gas Wells Impact GSSPR#12: Potential Exposure to Hazardous Gases during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		of Toxic Substances Control, regarding known areas of concern. Practices would include using safe and explosion-proof equipment during construction, and testing for gases regularly. Installation of passive or active gas venting systems, gas collection systems, as well as active monitoring systems and alarms would be required in underground construction areas and facilities where subsurface gases are present. Installing gas-detection systems can monitor the effectiveness of these systems during construction and operation of the proposed project.								
GEO-IAMF#4	Historic or Abandoned Mines and Other Toxic Sites	<p>Prior to Construction, the Contractor shall prepare a CMP addressing how historic and abandoned mines and other toxic sites would be incorporated into construction BMPs. The CMP would be submitted to the Authority for review and approval. Depending on the properties of an individual site, mitigations to address historic or abandoned sites could include:</p> <ul style="list-style-type: none"> Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Cleanup. Environmental cleanups at sites that are releasing or threatening to release hazardous substances such as heavy metals from acid mine drainage and contaminated water and vapors. Non-CERCLA Cleanup. Cleanups of non-hazardous substance-related surface disturbance such as revegetation of disturbed areas, stabilization of mine tailings, reconstruction of stream channels and floodplains. Safety Mitigation. Mitigation of physical safety hazards such as closure of adits and shafts and removal of dangerous structures. 	Design/ Construction	Prepare plan/ Design	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Impact GSSPR #11: Availability of Mineral Resources during Construction
GEO-IAMF#5	Hazardous Materials, Soils, or Vapors	<p>Prior to Construction, the Contractor shall prepare a CMP addressing how the contractor would minimize or avoid impacts related to hazardous minerals (i.e., radon, mercury, tetrachloroethylene, trichloroethylene, and naturally occurring asbestos [NOA]), soils, or vapors during construction. The CMP would be submitted to the Authority for review and approval. The CMP shall include appropriate provisions for handling hazardous mineral, soils, or vapors including, but not limited to, dust control, control of soil erosion and water runoff, vapor control, and testing and proper disposal of excavated material. The CMP shall include an effective monitoring and cleanup program to be developed and implemented for spills and leaks of any hazardous materials. For operations, the Authority shall prepare and deploy an Emergency Response Procedure Plan. In the unlikely event of a major hazardous materials release close to or in the vicinity of the Project, the Authority will develop emergency</p>	Design/ Construction	Design/ Monitoring/ Reporting	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Cumulative Construction Impacts to Paleontological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		response procedures in conformance with Federal, State, and local regulations.								
GEO-IAMF#6	Ground Rupture Early Warning Systems	Prior to Construction, the Contractor shall document how the project design incorporates installation of early warning systems, triggered by strong ground motion association with ground rupture. Known nearby active faults would be monitored. Linear monitoring systems, such as time domain reflectometers or similar technology, shall be installed along rail lines in the zone of potential ground rupture. These devices emit electronic information that is processed in a centralized location and would be used to temporarily control trains, thus reducing accidents due to fault creep. Damage to infrastructure from fault creep can be mitigated with routine maintenance, including minor realignment.	Design/ Construction	Design/ Monitoring	Prior to construction	Contractor	Contractor	Preparation of a Construction Management Plan	Condition of design-build contract	Impact GSSPR #14: Surface Fault Rupture during Operation Impact GSSPR #15: Seismic Ground Shaking during Operation
GEO-IAMF#7	Evaluate and Design for Large Seismic Ground Shaking	Prior to Construction, the Contractor shall document through preparation of a technical memorandum how all HSR components were evaluated and designed for large seismic ground shaking. Prior to final design, the Contractor would conduct additional seismic studies to establish up-to-date estimation of levels of ground motion. The most current Caltrans seismic design criteria at the time of design would be used in the design of any structures supported in or on the ground. These design procedures and features reduce to the greatest practical extent for potential movements, shear forces, and displacements that result from inertial response of the structure. In critical locations, pendulum base isolators may be used to reduce the levels of inertial forces. New composite materials may also be used to enhance seismic performance.	Design	Design/Studies	Prior to final design	Contractor/ Authority	Contractor/ Authority	At incorporation or completion of design	Seismic ground shaking design technical memorandum	Impact GSSPR #1: Surface Fault Rupture during Construction Impact GSSPR #5: Seismically Induced Slope Failure Hazards Associated with Landslides and Cut-and-Fill Slopes during Construction Impact GSSPR #15: Seismic Ground Shaking during Operation
GEO-IAMF#8	Suspension of Operations during an Earthquake	Prior to O&M activities, the Contractor shall document in a technical memorandum how suspension of operations during or after an earthquake was addressed in project design. Motion-sensing instruments to provide ground-motion data and a control system to shut down HSR operations temporarily during or after a potentially damaging earthquake would be incorporated into final design. Monitoring equipment would be installed at select locations where high ground motions could occur. The system would then be inspected for damage due to ground motion and/or ground deformation, and then returned to service when appropriate.	Design/ Construction/ Operation	Reporting	Prior to O&M activities	Contractor/ Authority	Contractor/ Authority	At incorporation or completion of design/during monthly construction report	Technical memorandum prepared as needed based on an earthquake event	Impact GSSPR#14: Surface Fault Rupture to People and Property during Operation Impact GSSPR#15: Seismic Ground Shaking to People and Property during Operation Impact S&S #7: High-Speed Rail Accidents Associated with Seismic Events
GEO-IAMF#9	Subsidence Monitoring	Prior to Operations and Maintenance, the Authority shall develop a stringent track monitoring program. Once tracks are operational, a remote monitoring program would be implemented to monitor the effects of ongoing subsidence. Track inspection systems would provide early warning of reduced track integrity. HSR train sets would be equipped with autonomous equipment for daily track surveys. This specification would be added to HSR train bid packages. If	Design/ Operation	Program development	Monthly	Authority	Contractor	Develop a stringent track monitoring program	Condition of design-build contract	Impact GSSPR#21: Ground Subsidence during Operation

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		monitoring indicates that track tolerances are not met, trains would operate at reduced speed until track tolerances are restored. In addition, the contractor responsible for wayside maintenance would be required to implement a stringent program for track maintenance.								
GEO-IAMF#10	Geology and Soils	<p>Prior to construction, the Contractor shall document through issuance of a technical memorandum how the following guidelines and standards have been incorporated into facility design and construction:</p> <ul style="list-style-type: none"> 2015 American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Bridge Design Specifications and the 2015 AASHTO Guide Specifications for Load and Resistance Factor Seismic Bridge Design, or their most recent versions. These documents provide guidance for characterization of soils, as well as methods to be used in the design of bridge foundations and structures, retaining walls, and buried structures. These design specifications would provide minimum specifications for evaluating the seismic response of the soil and structures. Federal Highway Administration (FHWA) Circulars and Reference Manuals: These documents provide detailed guidance on the characterization of geotechnical conditions at sites, methods for performing foundation design, and recommendations on foundation construction. These guidance documents include methods for designing retaining walls used for retained cuts and retained fills, foundations for elevated structures, and at-grade segments. Some of the documents include guidance on methods of mitigating geologic hazards that are encountered during design. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual: These guidelines deal with rail systems. Although they cover many of the same general topics as American Association of State Highway and Transportation Officials manuals, they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways. California Building Code: The code is based on 2015 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. International Building Code and American Society of Civil Engineers (ASCE)-7: These codes and standards provide minimum design loads for buildings and other structures. 	Design/ Construction/ Operation	Design/ Reporting	At incorporation or completion of design/during monthly construction reporting	Contractor	Contractor	Prepare technical memorandum/ Implementation of guidelines during design, construction, and operation phases	Condition of design-build contract	<p>Impact GSSPR #1: Surface Fault Rupture during Construction</p> <p>Impact GSSPR #2: Seismic Ground Shaking during Construction</p> <p>Impact GSSPR #3: Liquefaction and Other Types of Seismically Induced Ground Failure during Construction</p> <p>Impact GSSPR #5: Seismically Induced Slope Failure Hazards Associated with Landslides and Cut-and-Fill Slopes during Construction</p> <p>Impact GSSPR #6: Soil Erosion during Construction</p> <p>Impact GSSPR #7: Unstable or Collapsible Soils during Construction</p> <p>Impact GSSPR #9: Difficult Excavation Related to Encountering Cobbles or Boulders during Construction</p> <p>Impact GSSPR#10: Soil Corrosion and Expansion during Construction</p> <p>Impact GSSPR#16: Liquefaction and Other Types of Seismically Induced Ground Failure during Operation</p> <p>Impact GSSPR#23: Soil Corrosion and Expansion Hazards during Operation</p> <p>Impact S&S #8: Risk of Fire</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>They would be used for the design of the maintenance facilities and stations. Sections in IBC and ASCE-7 provide minimum requirements for geotechnical investigations, levels of earthquake ground shaking, minimum standards for structural design, and inspection and testing requirements.</p> <ul style="list-style-type: none"> Caltrans Design Standards: Caltrans has specific minimum design and construction standards for all aspects of transportation system design, ranging from geotechnical explorations to construction practices. These amendments provide specific guidance for the design of deep foundations that are used to support elevated structures, for design of mechanically stabilized earth (MSE) walls used for retained fills, and for design of various types of cantilever (e.g., soldier pile, secant pile, and tangent pile) and tie-back walls used for retained cuts. Caltrans Construction Manuals: Caltrans has a number of manuals including Field Guide to Construction Dewatering, Caltrans Construction Site BMPs Manual and Construction Site BMP Field Manual and Troubleshooting Guide. These provide guidance and best management practices for dewatering options and management, erosion control and soil stabilization, non-stormwater management, and waste management at construction sites. American Society for Testing and Materials (ASTM): ASTM has developed standards and guidelines for all types of material testing, from soil compaction testing to concrete-strength testing. The ASTM standards also include minimum performance requirements for materials. 								
GEO-IAMF#11	Engage a Qualified Paleontological Resources Specialist	<p>Prior to the 90 percent design milestone for each construction package (CP) within the Project Section, the Contractor would retain a Paleontological Resources Specialist (PRS) responsible for:</p> <ul style="list-style-type: none"> Reviewing the final design for the CP. Developing a detailed Paleontological Resources Monitoring and Mitigation Plan (PRMMP) for the CP The PRS would be responsible for implementing the PRMMP, including development and delivery of WEAP training, supervision of Paleontological Resource Monitors (PRMs), and evaluation and treatment of finds, if any, and preparation of a final paleontological mitigation report, per the PRMMP and for each CP. <p>Retention of PRS staff would occur in a timely manner, in advance of the 90 percent design milestone for each CP, such that the PRS is on board and can review the 90 percent design submittal without delay when it becomes available. If</p>	Design	Contractor would retain paleontological resources specialist	Prior to 90 percent design milestone for each CP	Contractor	Contractor	Retain PRS	Condition of design-build contract	Impact GSSPR #13: Geologic Units Sensitive for Paleontological Resources during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		feasible, the same PRS would be responsible for all CPs within a given Project Section. All PRS staff shall meet or exceed the qualifications for a Principal Paleontologist as defined in the Caltrans current <i>Standard Environmental Reference</i> , Chapter 8 (Caltrans 2012). Appointment of PRS staff would be subject to review and approval by the Authority.								
GEO-IAMF#12	Perform Final Design Review and Triggers Evaluation	For each CP within the Project Section, the responsible PRS would evaluate the 90 percent design submittal to identify the portions of the CP that would involve work in paleontologically sensitive geologic units (either at the surface or in the subsurface), based on findings of the final Paleontological Resources Technical Report (TR) prepared for the Project Section. Evaluation would consider the location, areal extent, and anticipated depth of ground disturbance, the construction techniques that are planned/proposed, and the geology (i.e., location of geologic units with high paleontological resources) of the CP and vicinity. The evaluation and resulting recommendations would be consistent with guidance in the Society of Vertebrate Paleontology (SVP) <i>Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources</i> (SVP Impact Mitigation Guidelines Revision Committee 2010), <i>the SVP Conditions of Receivership for Paleontologic Salvage Collections</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current <i>Caltrans Standard Environmental Reference</i> (Caltrans 2012). The purpose of the Final Design Review and Triggers Evaluation would be to develop specific language detailing the location and duration of paleontological monitoring and other requirements for paleontological resources applicable to each CP within the Project Section. Paleontological protection requirements identified through the Final Design Review and Triggers Evaluation would be recorded in a concise technical memorandum (“Final Design Review Requirements for Paleontological Resources Protection”), which would then be incorporated in full detail into the PRMMP for each CP. Those portions of the CP requiring paleontological monitoring would also be clearly delineated in the project construction documents for each CP.	Design	Reporting	Prior to 90 percent design milestone for each CP	Contractor	Contractor	CP reporting	Condition of design-build contract	Impact GSSPR #13: Geologic Units Sensitive for Paleontological Resources during Construction
GEO-IAMF#13	Prepare and Implement Paleontological Resources Monitoring and Mitigation Plan (PRMMP)	Following the Final Design Review and Triggers Evaluation for each CP, the PRS would develop a CP-specific PRMMP. For greater efficiency, PRMMPs may be written such that they cover more than one CP, as long as the specific requirements of the IAMFs are satisfied explicitly and in detail for each CP included. The PRMMP for each CP would incorporate the findings of the Design Review and Triggers Evaluation for that CP and	Design	Prepare CP-specific PRMMP	Following the Final Design Review and Triggers Evaluation for each CP	Contractor	Contractor	CP reporting	Condition of design-build contract	Impact GSSPR #13: Geologic Units Sensitive for Paleontological Resources during Construction

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		<p>would be consistent with the SVP <i>Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources</i> (SVP Impact Mitigation Guidelines Revision Committee 2010), the <i>SVP Conditions of Receivership for Paleontologic Salvage Collections</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996), and relevant guidance from Chapter 8 of the current <i>Caltrans Standard Environmental Reference</i> (Caltrans 2012). As such, the PRMMP would provide for at least the following:</p> <ul style="list-style-type: none"> ▪ Implementation of the PRMMP by qualified personnel, including the following positions: <ul style="list-style-type: none"> – Paleontological Resource Specialist: The PRS will be required to meet or exceed Principal Paleontologist Qualifications per Chapter 8 of the current Caltrans Standard Environmental Reference (Caltrans 2012). The Supervising Paleontologist may, but not necessarily, be the PRS who prepares the PRMMP. ▪ Development of pre-construction and construction-period coordination procedures and communications protocols. ▪ Evaluation as to whether a pre-construction survey by qualified personnel is warranted for the CP. In general, pre-construction surveys are beneficial if there is a strong possibility that significant paleontological resources (e.g., concentrations of vertebrate fossils) are exposed at the ground surface and would be destroyed during the initial clearing and grubbing phase of earthwork. Such a determination can usually be made during preparation of the paleontological resources TR. ▪ Requirements for paleontological monitoring by qualified personnel of all ground-disturbing activities known to affect, or potentially affect, highly sensitive geologic units and for ground-disturbing activities affecting other geologic units in any areas where the PRS considers it warranted based on the findings of the Paleontological Resources TR or any pre-construction surveys. In all areas of the CP subject to monitoring, monitoring would initially be conducted full-time for all ground-disturbing activities. However, the PRMMP may provide for monitoring frequency in any given location to be reduced once approximately 50 percent of the ground-disturbing activity in locations has been completed, if the reduction is appropriate based on the implementing PRS' professional judgment in consideration of actual site conditions. ▪ Provisions, if recommended by the PRS for paleontological monitoring of specific construction drilling operations. In general, small-diameter (i.e., less than 18 inches) drilling operations or drilling activities operations 								

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		<p>using bucket augers tend to pulverize impacted sediments and any contained fossils and are typically not monitored. The section in the PRMMP addressing monitoring program for drilling operations would rely, in part, on the information supplied by the CP design and geotechnical teams but would also take into consideration of the nature, depth, and location of drilling needed, and the anticipated equipment and staging configurations.</p> <ul style="list-style-type: none"> ▪ Provisions for the content development and delivery of paleontological resources Worker Environmental Awareness Program (WEAP) training. ▪ Provisions for in-progress documentation of monitoring (and, if applicable, salvage/recovery operations) via “construction dailies” or a similar approved means. ▪ Provisions for a “stop work, evaluate, and treat appropriately” response in the event of a known or potential paleontological discovery, including finds in highly sensitive geologic units, as well as finds, if any, in geologic units identified as less sensitive, or nonsensitive, for paleontological resources. ▪ Provisions for sampling and recovery of unearthed fossils consistent with <i>SVP Standard Procedures</i> (SVP Impact Mitigation Guidelines Revision Committee 2010) and the <i>SVP Conditions of Receivership</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996). Recovery procedures would provide for recovery of both macrofossils and microfossils. ▪ Provisions for acquiring a repository agreement from an approved regional repository for the curation, care, and storage of recovered materials, consistent with the <i>SVP Conditions of Receivership</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996). If more than one repository institution is designated, separate repository agreements must be provided. ▪ Provisions for preparation of a final monitoring and mitigation report that meets the requirements of the <i>Caltrans Standard Environmental Reference</i> Chapter 8 provisions for the Paleontological Monitoring Report and Paleontological Stewardship Summary (Caltrans 2012). ▪ Provisions for the preparation, identification, and analysis and curation of fossil specimens and data recovered, consistent with the <i>SVP Conditions of Receivership</i> (SVP Conformable Impact Mitigation Guidelines Committee 1996) and any specific requirements of the designated repository institution(s). 								

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GEO-IAMF#14	Provide WEAP Training for Paleontological Resources	<p>Prior to groundbreaking for each CP within the Project Section, the Contractor would provide paleontological resources WEAP training delivered by the PRS. All management and supervisory personnel and construction workers involved with ground-disturbing activities would be required to take this training before beginning work on the project. Refresher training would also be made available to management and supervisory personnel and workers as needed, based on the judgment of the PRS.</p> <p>At a minimum, paleontological resources WEAP training would include information on:</p> <ul style="list-style-type: none"> ▪ The coordination between construction staff and paleontological staff, ▪ The construction and paleontological staff roles and responsibilities in implementing the PRMMP, ▪ The possibility of encountering fossils during construction, ▪ The types of fossils that may be seen and how to recognize them, and ▪ The proper procedures in the event fossils are encountered, including the requirement to halt work in the vicinity of the find and procedures for notifying responsible parties in the event of a find. <p>Training materials and formats may include, but are not necessarily limited to, in-person training, prerecorded videos, posters, and informational brochures that provide contacts and summarize procedures in the event paleontological resources are encountered. WEAP training contents would be subject to review and approval by the Authority. Paleontological resources WEAP training may be provided concurrently with cultural resources WEAP training.</p> <p>Upon completion of any WEAP training, the Contractor would require workers to sign a form stating that they attended the training and understand and would comply with the information presented. Verification of paleontological resources WEAP training will be provided to the Authority by the Contractor.</p>	Pre-construction	Training program/ Reporting	Prior to groundbreaking for each CP within the Project Section , then annual (training)/ Monthly (reporting)	Contractor/ Authority	Contractor/ Authority	WEAP training	Condition of design-build contract	Impact GSSPR #13: Geologic Units Sensitive for Paleontological Resources during Construction
GEO-IAMF#15	Halt Construction, Evaluate, and Treat if Paleontological Resources Are Found	<p>Consistent with the PRMMP, if fossil materials are discovered during construction, regardless of the individual making the discovery, all activity in the immediate vicinity of the discovery would halt and the find would be protected from further disturbance. If the discovery is made by someone other than the PRS or Paleontological Resource Monitors, the person who made the discovery would immediately notify construction supervisory personnel, who would in turn notify the PRS. Notification to the PRS would take place promptly (prior to the close of work the same day as the find), and the PRS would evaluate the find and prescribe appropriate</p>	Construction	Reporting	Daily logs during active monitoring	Contractor	Contractor	Weekly reporting (if resource is identified during construction)	PRMMP, WEAP	Impact GSSPR #13: Geologic Units Sensitive for Paleontological Resources during Construction

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		<p>treatment as soon as feasible. Work may continue on other portions of the CP while evaluation (and, if needed, treatment) takes place, as long as the find can be adequately protected in the judgment of the PRS.</p> <p>If the PRS determines that treatment (i.e., recovery and documentation) of unearthed fossil(s) is warranted, such treatment and any required reporting would proceed consistent with the PRMMP. The Contractor would be responsible for ensuring prompt and accurate implementation, subject to verification by the Authority. The stop work requirement does not apply to drilling operations because drilling typically cannot be suspended in mid-course. However, if finds are made during drilling, the same notification and other follow-up requirements would apply. The PRS would coordinate with construction supervisory and drilling staff regarding the handling of recovered fossils. The requirements of this IAMF would be detailed in the PRMMP and presented as part of the paleontological resources WEAP training.</p>								
Hazardous Materials and Wastes										
HMW-IAMF#1	Property Acquisition Phase 1 and Phase 2 Environmental Site Assessments	<p>During the right-of-way acquisition phase, Phase I environmental site assessments (ESA) shall be conducted in accordance with standard ASTM methodologies to characterize each parcel. The determination of parcels that require a Phase II ESA (e.g., soil, groundwater, soil vapor subsurface investigations) would be informed by a Phase I ESA and may require coordination with state and local agency officials. If the Phase II ESA concludes that the site is impacted, remediation or corrective action (e.g., removal of contamination, in-situ treatment, or soil capping) would be conducted with state and local agency officials (as necessary) and in full compliance with applicable state and federal laws and regulations.</p>	Pre-construction/ Construction	Conduct Phase I and Phase II ESAs	During the right-of-way acquisition phase	Contractor	Contractor	Prepare Phase I and II ESAs	Condition of design-build contract	<p>Impact HMW #2: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials during Construction</p> <p>Impact HMW #3: Hazards Due to Project Location on Potential Environmental Concern Sites or Cortese List Sites during Construction</p> <p>Impact HMW #7: Hazard Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Operation</p> <p>Impact HMW #8: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials during Operation</p> <p>Impact HMW #9: Hazards Due to Project Location on Potential Environmental Concern Sites or Hazardous Material Sites Compiled Pursuant to Government Code Section 65962.5 during Operation</p> <p>Impact HMW #10: Emit Hazardous Emissions or Handle Hazardous or Acutely Hazardous Materials, Substances, or Waste within 0.25 Mile of a School during Operation</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
										Impact HWR#3: Temporary Impacts on Surface Water Quality during Construction Impact HWR#10: Intermittent Continuous Permanent Surface Water Quality during Operations
HMW-IAMF#2	Landfill	Prior to Construction (any ground disturbing activities), the Contractor shall verify to the Authority through preparation of a technical memorandum that methane protection measures would be implemented for all work within 1,000 feet of a landfill, including gas detection systems and personnel training. This would be undertaken pursuant to State of California Title 27, Environmental Protection – Division 2, Solid Waste, and the hazardous materials best management practices plan.	Pre-construction	Prepare technical memorandum	Prior to Construction (any ground disturbing activities)	Contractor	Contractor	Prepare technical memorandum describing methane protection measures	Technical memorandum	Impact HMW #6: Risks during Construction on or near Landfills and Oil and Gas Wells Impact S&S #1: Accidents and Health Risks at Construction Sites
HMW-IAMF#3	Work Barriers	Prior to construction (any ground-disturbing activities), the Contractor shall verify to the Authority through preparation of a technical memorandum the use of work barriers. Nominal design variances, such as the addition of a plastic barrier beneath the ballast material to limit the potential release of volatile subsurface contaminants, may be implemented in conjunction with site investigation and remediation.	Pre-construction/ Construction	Prepare technical memorandum	Prior to Construction (any ground disturbing activities)	Contractor	Contractor	Prepare work barrier technical memorandum	Condition of design-build contract	Impact HMW #2: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions That Involve the Release of Hazardous Materials during Construction
HMW-IAMF#4	Undocumented Contamination	Prior to construction, the Contractor shall prepare a CMP addressing provisions for the disturbance of undocumented contamination. The plan would be submitted to the Authority for review and approval. Undocumented contamination could be encountered during construction activities and the Contractor would work closely with local agencies to resolve any such encounters and address necessary clean-up or disposal. Copies of all required hazardous material documentation shall be provided within 30 days to the Authority.	Pre-construction/ Construction	Prepare plan/ Reporting	Prior to Construction	Contractor	Contractor	Prepare CMP/Reporting as needed	Condition of design-build contract	Impact HMW #2: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials during Construction Impact HMW #3: Hazards Due to Project Location on Potential Environmental Concern Sites or Cortese List Sites during Construction
HMW-IAMF#5	Demolition Plans	Prior to Construction that involves demolition, the Contractor shall prepare demolition plans for the safe dismantling and removal of building components and debris. The demolition plans would include a plan for lead and asbestos abatement. The plans shall be submitted to the Project Construction Manager (PCM) on behalf of the Authority for verification that appropriate demolition practices have been followed consistent with federal and state regulations regarding asbestos and lead paint abatement.	Pre-construction/ Construction	Prepare plan/Reporting	Prior to Construction that involves demolition	Contractor	Contractor	Prepare demolition plans/Reporting as needed	Condition of design-build contract	Impact HMW #1: Hazards Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Construction Impact HMW #2: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials during Construction Impact HMW #4: Hazards Due to Increased Exposure to Asbestos as a Result of Building Demolition

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HMW-IAMF#6	Spill Prevention	Prior to Construction (any ground disturbing activities), the Contractor shall prepare a CMP addressing spill prevention. A Spill Prevention, Control, and Countermeasure (SPCC) plan (or Soil Prevention and Response Plan if the total aboveground oil storage capacity is less than 1,320 gallons in storage containers greater than or equal to 55-gallons) shall prescribe BMPs to follow to prevent hazardous material releases and clean-up of any hazardous material releases that may occur. The plans would be prepared and submitted to the PCM on behalf of the Authority and shall be implemented during Construction.	Pre-construction/ Construction	Prepare plan/Reporting	Prior to Construction (any ground disturbing activities)/reporting during construction	Contractor	Contractor	Prepare CMP/Reporting as needed	Condition of design-build contract	Impact HMW #2: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials during Construction Impact BIO #1: Construction Effects on Special-Status Plant Species Impact BIO #2: Construction Effects on Special-Status Wildlife Species Impact BIO #3 Construction Effects on Special-Status Natural Communities Impact BIO #4: Construction Effects on Wetlands and Other Aquatic Resources Impact BIO #6: Construction Effects on Protected Trees Impact HMW #6: Risks during Construction on or near Landfills and Oil and Gas Wells Impact HWR #3: Temporary Impacts on Surface Water Quality during Construction
HMW-IAMF#7	Storage and Transport of Materials	During Construction, the Contractor would comply with applicable state and federal regulations, such as the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Hazardous Materials Release Response Plans and Inventory Law, and the Hazardous Waste Control Act. Prior to Construction the Contractor would provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials storage and transport.	Pre-construction/ Construction	Regulation compliance/ Reporting	Monthly	Contractor	Contractor	Weekly record keeping/monthly reporting	Condition of design-build contract	Impact HMW#1: Temporary Effects from the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HMW #5: Emit Hazardous Emissions or Handle Hazardous or Acutely Hazardous Materials, Substances, or Waste within 0.25 Mile of a School during Construction Impact HWR #3: Temporary Impacts on Surface Water Quality during Construction Impact SOCIO #14: Temporary Impacts on Children's Health and Safety from Construction

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HMW-IAMF#8	Permit Conditions	During Construction and Operation, the Contractor would comply with the State Water Resources Control Board Construction Clean Water Act Section 402 General Permit conditions and requirements for transport, labeling, containment, cover, and other BMPs for storage of hazardous materials during Construction and Operation. Prior to Construction, the Contractor shall provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous waste and hazardous materials transport, containment, and storage BMPs that would be implemented during Construction and Operation.	Pre-construction/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare hazardous materials and waste plan	Condition of design-build contract	Impact HMW#1: Temporary Effects from the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW#2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HMW #5: Emit Hazardous Emissions or Handle Hazardous or Acutely Hazardous Materials, Substances, or Waste within 0.25 Mile of a School during Construction Impact HWR #1: Temporary Impacts on Drainage Patterns, Stormwater Runoff, and Hydraulic Capacity (Surface Water Hydrology) during Construction Impact HWR #3: Temporary Impacts on Surface Water Quality during Construction
HMW-IAMF#9	Environmental Management System	To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous substances in the material selection process for construction, operation, and maintenance of the HSR system. The Authority would use an Environmental Management System to describe the process that would be used to evaluate the full inventory of hazardous materials as defined by federal and state law employed on an annual basis and would replace hazardous substances with nonhazardous materials. The Contractor shall implement the material substitution recommendation contained in the annual inventory.	Pre-construction/ Construction	Reporting	Annual	Contractor	Contractor	Annual reporting	Condition of design-build contract/EMS	Impact HMW #1: Temporary Effects from the Routine Transport, Use, or Disposal of Hazardous Materials and Wastes Impact HMW #2: Temporary Effects Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials Impact HWR #10: Intermittent and Continuous Permanent Impacts on Surface Water Quality during Operations
HMW-IAMF#10	Hazardous Materials Plans	Prior to Operation and Maintenance activities, the Authority shall prepare hazardous materials monitoring and reporting plans. These would use as a basis source, such as a hazardous materials business plan as defined in Title 19 California Code of Regulations and a SPCC plan.	Post-construction	Prepare plans	Prior to operations	Authority	Authority	Prepare hazardous materials monitoring plans	Condition of design-build contract	Impact HMW #7: Hazard Due to the Routine Transport, Use, or Disposal of Hazardous Materials during Operation Impact HMW #8: Hazards Due to Reasonably Foreseeable Upset and Accident Conditions that Involve the Release of Hazardous Materials during Operation Impact HMW #10: Emit Hazardous Emissions or Handle Hazardous or Acutely Hazardous Materials, Substances, or Waste within 0.25 Mile of a School during Operation Impact HWR #10: Intermittent and Continuous Permanent Impacts on Surface Water Quality during Operations

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HMW-IAMF#11	Stakeholder Consultation for the San Fernando Valley Groundwater Basin Superfund Site	<p>As design of the Burbank to Los Angeles Project Section progresses, more project-specific information will be developed regarding the requisite permitting and project design for the potential replacement of, or modification to, extraction wells and/or other ancillary infrastructure used for municipal water supply and remediation of groundwater within the Burbank and Glendale Operable Units of the Superfund Sites in the San Fernando Valley.</p> <p>As the design progresses, the Authority will coordinate with relevant stakeholders on an ongoing basis to review the permitting requirements as well as the project design and construction methods for proposed modifications to the extraction wells and ancillary infrastructure to ensure that municipal water supplies and the effectiveness of the Superfund Site clean-up remedies are not impaired by construction and operation of the HSR Build Alternative. Relevant stakeholders include the United States Environmental Protection Agency (EPA), the California Department of Toxic Substances Control, the California Regional Water Quality Control Board - Los Angeles Region, the California Department of Water Resources, the State Water Resources Control Board Division of Drinking Water, the City of Burbank, the City of Glendale, and Potentially Responsible Parties named in the Second Consent Decree for San Fernando Valley Superfund Site, Burbank Operable Unit, Civil Action No. 4527-MRP(tx) (C.D. Cal. June 23, 1998) and the Consent Decree for the San Fernando Valley Superfund Site and the Consent Decree for the Glendale Operable Unit, Civil Action No. 99-00552 MRP (ANx). The purpose of this ongoing stakeholder coordination is to ensure that municipal water supplies and the effectiveness of the Superfund Site clean-up remedies are not impaired by construction and operation of the HSR Build Alternative. The Authority would coordinate with relevant stakeholders on issues such as ensuring system shutdowns occur within normal timeframes, maintaining operating of existing systems while testing new replacement systems, and providing additional groundwater or surface water supplies if needed.</p> <p>Depending upon the scope of the potential modifications to the extraction wells and ancillary infrastructure, the Authority shall enter into enforceable agreements with the United States Environmental Protection Agency as the agency responsible for the Superfund Program.</p>	During Design	Stakeholder Coordination	Ongoing	Authority	Contractor	the Authority will coordinate with relevant stakeholders on an ongoing basis to review the permitting requirements as well as the project design and construction methods for proposed modifications to the extraction wells and ancillary infrastructure to ensure that municipal water supplies and the effectiveness of the Superfund Site clean-up remedies are not impaired by construction and operation of the HSR Build Alternative	Condition of design-build contract	Impact HMW #3: Hazards Due to Project Location on Potential Environmental Concern Sites or Cortese List Sites during Construction

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Safety and Security										
SS-IAMF#1	Construction Safety Transportation Management Plan	Prior to construction (any ground-disturbing activity), the Contractor shall prepare for submittal to the Authority a Construction Safety Transportation Management Plan. The plan would describe the Contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access. The plan would also specify the Contractor's procedures for implementing temporary road closures, including access to residences and businesses during construction, lane closures, signage and flag persons, temporary detour provisions, alternative bus and delivery routes, emergency vehicle access, and alternative access locations. The Contractor shall prepare and submit monthly reports to the Authority documenting construction transportation plan implementation activities for compliance monitoring.	Pre-construction/ Construction	Prepare plan	Prior to construction (any ground-disturbing activity)	Contractor	Contractor	Prepare Construction Safety Transportation Management Plan	Condition of design-build contract	Impact S&S #2: Accidents Associated with Construction-Related Detours Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction Impact S&S#3: Increased Response Times for Fire, Rescue, and Emergency Services from Temporary Road Closures Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction
SS-IAMF#2	Safety and Security Management Plan	Sixty days after receiving from the Authority a construction notice to proceed, the Contractor shall provide the Authority with a technical memorandum documenting how the following requirements, plans, programs and guidelines were considered in design, construction, and eventual operation to protect the safety and security of construction workers and users of the HSR. The Contractor shall be responsible for implementing all construction-related safety and security plans and the Authority shall be responsible for implementing all safety and security plans related to HSR operation. <ul style="list-style-type: none"> Workplace worker safety is generally governed by the Occupational Health and Safety Act of 1970, which established OSHA. OSHA establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, OSHA enforcement of workplace requirements is performed by Cal-OSHA. Under Cal-OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program. The Authority has adopted a Safety and Security Management Plan to guide the safety and security activities, processes, and responsibilities during design, construction and implementation phases of the project to protect the safety and security of construction workers and the public. A Systems Safety Program Plan (SSPP) and a System Security Plan would be implemented prior to the start of revenue service to guide the safety and security of the operation of the HSR system. Prior to construction, the Contractor shall provide the Authority with a Safety and Security Management Plan documenting how they would implement the Authority's 	Pre-construction/ Construction	Prepare plan	Sixty days after receiving a construction notice to proceed	Contractor/ Authority	Contractor/ Authority	Prepare technical memorandum documenting compliance with safety requirements, plans, programs, and guidelines	Condition of design-build contract	Impact S&S #1: Accidents and Health Risks at Construction Sites Impact S&S #5: Train Accidents Impact S&S #8: Risk of Fire Impact S&S #9: Increased Response Times for Fire, Rescue, and Emergency Services from Permanent Road Closures Impact S&S #10: Increased Response Times for Fire, Rescue, and Emergency Services Associated with Access to Elevated Track and Tunnels Impact S&S #11: Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities Impact S&S #18: Criminal Activity and Emergencies aboard Trains and at Stations, Right-of-Way, and Facilities Impact SOCIO #7: Temporary Disruption to Community Facilities from Construction

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		<p>safety and security requirements within their project scope.</p> <ul style="list-style-type: none"> ▪ Implement site-specific health and safety plans and site-specific security plans to establish minimum safety and security guidelines for contractors of, and visitors to, construction projects. Contractors would be required to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites. ▪ Preparation of a Valley fever action plan that includes: (1) information on causes, preventative measures, symptoms, and treatments for Valley fever to individuals who could potentially be exposed through construction activities (i.e., construction workers, monitors, managers, and support personnel); (2) continued outreach and coordination with California Department of Public Health; (3) coordination with county departments of public health to ensure that the above-referenced information concerning Valley fever is readily available to nearby residents, schools, and businesses and to obtain area information about Valley fever outbreaks and hotspots; and (4) provide a qualified person dedicated to overseeing implementation of the Valley fever prevention measures to encourage a culture of safety of the contractors and subcontractors. The Valley Fever Health and Safety designee shall coordinate with the county Public Health Officer and oversee and manage the implementation of Valley Fever control measures. The designee is responsible for ensuring the implementation of measures in coordination with the county Public Health Officer. Medical information would be maintained following applicable and appropriate confidentiality protections. The Valley Fever Health and Safety designee, in coordination with the county Public Health Officer, would determine what measures would be added to the requirements for the Safety and Security Management Plan regarding preventive measures to avoid Valley fever exposure. Measures shall include, but are not limited to, the following: (1) train workers and supervisors on how to recognize symptoms of illness and ways to minimize exposure, such as washing hands at the end of shifts; (2) provide washing facilities nearby for washing at the end of shifts; (3) provide vehicles with enclosed, air conditioned cabs and make sure workers keep the windows closed; (4) equip heavy equipment cabs with high-efficiency particulate air (HEPA) filters; and (5) make NIOSH-approved respiratory protection with particulate filters as recommended by the California 								

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		<p>Department of Public Health available to workers who request them.</p> <ul style="list-style-type: none"> ▪ System safety program plans incorporate FRA requirements and are implemented upon Authority approval. FRA's Systems Safety Program Plans requirements would be determined in FRA's new System Safety Regulation (49 C.F.R. 270). ▪ Rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules and practices, passenger safety, emergency response, and passenger equipment safety standards found in 49 C.F.R. Parts 200-299. ▪ The <i>HSR Urban Design Guidelines</i> (Authority 2011) require implementing the principles of crime prevention through environmental design. The contractor shall consider four basic principles of crime prevention through environmental design during station design and site planning: (1) territoriality (design physical elements that express ownership of the station or site); (2) natural surveillance (arrange physical features to maximize visibility); (3) improved sightlines (provide clear views of surrounding areas); and (4) access control (provide physical guidance for people coming and going from a space). The HSR design includes emergency access to the rail right-of-way, and elevated HSR structure design includes emergency egress points. ▪ Implement fire/life safety and security programs that promote fire and life safety and security in system design, construction, and implementation. The fire and life safety program is coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes. The Authority would establish fire/life safety and security committees throughout the HSR section. ▪ Implement system security plans that address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. A dedicated police force would ensure that the security needs of the HSR system are met. ▪ The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections and the provision of appropriate space as defined by fire and safety codes along at-grade sections of the alignment to allow for emergency response access. 								

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		<ul style="list-style-type: none"> Implement standard operating procedures and emergency operating procedures, such as the FRA-mandated Roadway Worker Protection Program to address the day-to-day operation and emergency situations that would maintain the safety of employees, passengers, and the public. 								
SS-IAMF#3	Hazard Analyses	<p>The Authority’s hazard management program includes the identification of hazards, assessment of associated risk, and application of control measures (mitigation) to reduce the risk to an acceptable level. Hazard assessment includes a preliminary hazard analysis and threat and vulnerability assessment.</p> <ul style="list-style-type: none"> The Authority’s programmatic preliminary hazard analyses are developed in conformance with the FRA’s <i>Collision Hazard Analysis Guide: Commuter and Intercity Passenger Service</i> (FRA 2007) and the U.S. Department of Defense’s <i>System Safety Program Plan</i> (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed—and either eliminated or minimized—by the design. Threat and vulnerability assessments establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations. Provisions include right-of-way fencing, intrusion detection, security lighting, security procedures and training, and closed-circuit televisions. Intrusion-detection technology could also alert to the presence of inert objects, such as toppled tall structures or derailed freight trains, and stop HSR operations to avoid collisions. During design and construction, the Contractor would conduct site-specific preliminary hazard analysis and threat and vulnerability assessments to apply the programmatic work to their specific project designs. <p>The Authority’s safety and security committees would be responsible for implementing the recommendations contained in the hazard analysis during HSR operation.</p>	Pre-construction/ Construction	Reporting	Monthly	Authority	Authority	Monthly reporting	Condition of design-build contract	Impact S&S #5: Train Accidents Impact S&S #18: Criminal Activity and Emergencies aboard Trains and at Stations, Right-of-Way, and Facilities

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
SS-IAMF#4	Oil and Gas Wells	Prior to ground-disturbing activities, the Contractor shall identify and inspect all active and abandoned oil and gas wells within 200 feet of the HSR tracks. Any active wells would be abandoned and relocated by the Contractor in accordance with the California Department of Conservation, Division of Oil, and Gas and Geothermal Resources (DOGGR) standards in coordination with the well owners. In the event that relocated wells do not attain the current production rates of the now-abandoned active wells, the Authority would be responsible for compensating the well owner for lost production. All abandoned wells within 200 feet of the HSR tracks would be inspected and re-abandoned, as necessary, in accordance with DOGGR standards and in coordination with the well owner. The Contractor would provide the Authority with documentation that the identification and inspection of the wells has occurred prior to construction.	Pre-construction	Regulatory Compliance/ Reporting	Prior to ground-disturbing activities	Contractor/Authority	Authority	Compliance with DOGGR standards	Condition of design-build contract	Impact S&S #1: Accidents and Health Risks at Construction Sites Impact PU&E #8: Potential Conflicts with Oil Wells Impact HMW #3: Temporary Effects Due to Project Location on Potential Environmental Concern Sites or Sites on the Cortese List Impact HMW #6: Risks during Construction on or near Landfills and Oil and Gas Wells Impact GSSPR #12: Potential Exposure to Hazardous Gases during Construction
SS-IAMF#5	Aviation Safety	To address Federal Aviation Administration (FAA) requirements related to their mandate of ensuring civil aviation safety and to prevent the potential for disruption of airfield and airspace operations at Hollywood Burbank Airport as a result of construction and/or operation of the Burbank to Los Angeles Project Section, the Authority and/or its contractor(s) on behalf of the Authority will: <ul style="list-style-type: none"> Submit designs and/or information to the FAA as required by Code of Federal Regulations, Title 14, Part 77, to ensure design of permanent HSR features within and adjacent to the boundary of Hollywood Burbank Airport do not adversely affect imaginary surfaces as defined in 14 C.F.R. section 77.9(b). Submit construction plans and/or information to the FAA as required by Code of Federal Regulations, Title 14, Part 77, which may include the location of planned HSR construction and construction staging areas within and adjacent to the boundary of the Hollywood Burbank Airport, the types and height of proposed equipment, and planned time/duration of construction, to ensure construction within and adjacent to the boundary of Hollywood Burbank Airport does not adversely affect imaginary surfaces as defined in 14 C.F.R. section 77.9(b). Implement measures required by the FAA to ensure continued safety of air navigation during HSR construction and operation, pursuant to 14 C.F.R. section 77.5(c). Ensure that the planned HSR facilities do not violate any grant assurances that are imposed at Hollywood Burbank 	Pre-Construction	Prepare plan/reporting	Monthly	Authority	Authority	Compliance with FAA requirements related to aviation safety	Condition of design-build contract	Impact S&S #1: Accidents and Health Risks at Construction Sites Impact S&S #12: Accident Risks to Airports, Private Airstrips, and Heliports Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction

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		<p>Airport as a condition for obtaining an Airport Improvement Grants from the FAA.</p> <ul style="list-style-type: none"> If applicable, work with the Burbank-Glendale-Pasadena Airport Authority (BGPAA) to amend the current Airport Layout Plan to depict the permanent above-ground facilities required for the HSR project, to be submitted to the FAA for approval. 								
SS-IAMF#6	Stakeholder Coordination for the Hollywood Burbank Airport	As design of the Burbank to Los Angeles Project Section progresses, the Authority shall continue to coordinate with the Federal Aviation Administration (FAA) and the Burbank-Glendale-Pasadena Airport Authority (BGPAA) to avoid conflicts due to overlapping construction schedules and future operations at the Hollywood Burbank Airport. The purpose of this ongoing stakeholder coordination is to ensure that the design, construction, and operation of the HSR Build Alternative takes into consideration the Airport Layout Plan (ALP) and any future improvements to the Hollywood Burbank Airport identified in SCAG's 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy and to ensure that construction and operation of the HSR Build Alternative do not negatively impact these future improvements.	During design	Coordination	Ongoing	Authority	Contractor	Authority shall continue to coordinate with the Federal Aviation Administration (FAA) and the Burbank-Glendale-Pasadena Airport Authority (BGPAA) to avoid conflicts due to overlapping construction schedules and future operations at the Hollywood Burbank Airport	Condition of design-build contract	Impact S&S #1: Accidents and Health Risks at Construction Sites Impact S&S #12: Accident Risks to Airports, Private Airstrips, and Heliports

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
Socioeconomics and Communities										
SOCIO-IAMF#1	Construction Management Plan	Prior to construction, the Contractor shall prepare a CMP providing measures that minimize impacts on low-income households and minority populations. The plan shall be submitted to the Authority for review and approval. The plan would include actions pertaining to communications, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on low-income households and minority populations. The plan would verify that property access is maintained for local businesses, residences, and emergency services. This plan would include maintaining customer and vendor access to local businesses throughout construction by using signs to instruct customers about access to businesses during construction. In addition, the plan would include efforts to consult with local transit providers to minimize impacts on local and regional bus routes in affected communities.	Design/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare CMP	Condition of design-build contract	Impact SOCIO #14: Temporary Impacts on Children's Health and Safety from Construction Impact TR #1: Temporary Road Closures during Construction
SOCIO-IAMF#2	Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act	The Authority must comply with the Uniform Act. The provisions of the Uniform Act, a federally mandated program, would apply to all acquisitions of real property or displacements of persons resulting from this federally assisted project. It was created to provide for fair and equitable treatment of all affected persons. Additionally, the Fifth Amendment of the U.S. Constitution provides that private property may not be taken for a public use without payment of "just compensation." The Uniform Act requires that the owning agency provide notification to all affected property owners of the agency's intent to acquire an interest in their property. This notification includes a written offer letter of just compensation. A right-of-way specialist is assigned to each property owner to assist him or her through the acquisition process. The Uniform Act also provides benefits to displaced individuals to assist them financially and with advisory services related to relocating their residence or business operation. Benefits are available to both owner occupants and tenants of either residential or business properties. The Uniform Act requires provision of relocation benefits to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits to which eligible owners or tenants may be entitled are determined on an individual basis and explained in detail by an assigned right-of-way specialist.	Design/ Construction/ Operation	Reporting and meeting with interested parties	Prior to completion of property acquisition	Authority	Authority	Comply with Uniform Act/Monthly reporting and record keeping	Compliance with acts, creation of ombudsman office and reporting	Impact SOCIO #2: Permanent Disruption to Community Cohesion or Division of Existing Communities from Construction Impact SOCIO #3: Permanent Displacement and Relocation of Local Residents from Construction Impact SOCIO #4: Permanent Displacement and Relocation of Local Businesses from Construction Impact SOCIO #5: Permanent Displacement and Relocation of Sensitive Populations during Construction Impact SOCIO #12: Permanent Changes in School District Funding from Construction Impact TR #3: Permanent Road Closures during Operation

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		<p>The California Relocation Assistance Act essentially mirrors the Uniform Act and also provides for consistent and fair treatment of property owners. However, because the project would receive federal funding, the Uniform Act takes precedence. Owners of private property have federal and state constitutional guarantees that their property would not be acquired or damaged for public use unless owners first receive just compensation. Just compensation is measured by the "fair market value," where the property value is considered to be the highest price that would be negotiated on the date of valuation. The value must be agreed upon by a seller who is willing, not obliged to sell, but under no particular or urgent necessity and by a buyer who is ready, willing, and able to buy but under no particular necessity. Both the owner and the buyer must deal with the other with the full knowledge of all the uses and purposes for which the property is reasonably adaptable and available (Code of Civil Procedure Section 1263.320a).</p> <p>More detailed information about how the Authority plans to comply with the Uniform Act and the California Relocation Assistance Act is provided in the following three detailed relocation assistance documents modeled after Caltrans versions:</p> <p>Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Residential)</p> <p>Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Mobile Home)</p> <p>Your Rights and Benefits as a Displaced Business, Farm, or Nonprofit Organization under the Uniform Relocation Assistance Program</p>								
SOCIO-IAMF#3	Relocation Mitigation Plan	<p>Before any acquisitions occur, the Authority would develop a relocation mitigation plan, in consultation with affected cities and counties and property owners. In addition to establishing a program to minimize the economic disruption related to relocation, relocation mitigation plan would be written in a style that also enables it to be used as a public-information document.</p> <p>The relocation mitigation plan would be designed to meet the following objectives:</p> <ul style="list-style-type: none"> Provide affected property and business owners and tenants a high level of individualized assistance in situations when acquisition is necessary and the property owner desires to relocate the existing land use. Coordinate relocation activities with other agencies acquiring property resulting in displacements in the study area to provide for all displaced persons and businesses to receive fair and consistent relocation benefits. 	Design/ Construction	Prepare plan	Prior to property acquisitions	Authority	Authority	Develop relocation mitigation plan	Condition of design-build contract	<p>Impact SOCIO #2: Permanent Disruption to Community Cohesion or Division of Existing Communities from Project Construction</p> <p>Impact SOCIO #3: Permanent Displacement and Relocation of Local Residents from Construction</p> <p>Impact SOCIO #4: Permanent Displacement and Relocation of Local Businesses from Construction</p> <p>Impact SOCIO #5: Permanent Displacement and Relocation of Sensitive Populations from Construction</p> <p>Impact LU #1: Temporary Land Use Conversion and Incompatibility</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<ul style="list-style-type: none"> Make a best effort to minimize the permanent closure of businesses and nonprofit agencies as a result of property acquisition. Within the limits established by law and regulation, minimize the economic disruption caused to property owners by relocation. In individual situations, where warranted, consider the cost of obtaining the entitlement permits necessary to relocate to a suitable location and take those costs into account when establishing the fair market value of the property. Provide those business owners who require complex permitting with regulatory compliance assistance. <p>The relocation mitigation plan would include the following components:</p> <ul style="list-style-type: none"> A description of the appraisal, acquisition, and relocation process as well as a description of the activities of the appraisal and relocation specialists. A means of assigning appraisal and relocation staff to affected property owners, tenants, or other residents on an individual basis. Individualized assistance to affected property owners, tenants, or other residents in applying for funding, including research to summarize loans, grants, and federal aid available, and research areas for relocation. Creation of an ombudsman's position to act as a single point of contact for property owners, residents, and tenants with questions about the relocation process. The ombudsman would also act to address concerns about the relocation process as it applies to the individual situations of property owners, tenants, and other residents. 								
Station Planning, Land Use, and Development										
LU-IAMF#1	HSR Station Area Development General Principals and Guidelines	Prior to Operation and Maintenance, the Authority shall prepare a memorandum for each station describing how the Authority's station area development principles and guidelines are applied to achieve the anticipated benefits of station area development. Refer to HSR Station Area Development: General Principles and Guidelines, February 3, 2011	Post-construction	Reporting	Prior to Operation and Maintenance for each station	Authority	Authority	Authority would prepare a technical memorandum for each station	Condition of design-build contract	Impact LU #4: Potential for Operations to Conflict with Land Use Patterns
LU-IAMF#2	Station Area and Local Agency Coordination	Prior to Operation and Maintenance, the Authority shall prepare a memorandum for each station describing the local agency coordination and station area planning conducted to prepare the station area for HSR operations. Refer to HSR Station Area Development: General Principles and Guidelines, February 3, 2011.	Post-construction	Reporting	Prior to Operation and Maintenance for each station	Authority	Authority	Authority would prepare a technical memorandum for each station	Condition of design-build contract	Impact LU #4: Potential for Operations to Conflict with Land Use Patterns

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
LU-IAMF#3	Restoration of Land Used Temporarily During Construction	Prior to any ground disturbing activities at the site of land to be used temporarily during construction, the Contractor shall prepare a restoration plan addressing specific actions, sequence of implementation, parties responsible for implementation and successful achievement of restoration for temporary impacts. Before beginning construction use of land, the Contractor shall submit the restoration plan to the Authority for review and obtain Authority approval. The restoration plan shall include time-stamped photo documentation of the pre-construction conditions of all temporary staging areas. All construction access, mobilization, material laydown, and staging areas would be returned to a condition equal to the pre-construction staging condition. This requirement is included in the design-build construction contract requirements.	Pre-construction	Prepare restoration plan	Prior to construction	Contractor	Contractor	Contractor would prepare a restoration plan	Condition of design-build contract	Impact LU #1: Temporary Land Use Conversion and Incompatibility Impact LU #3: Potential for Construction to Permanently Disrupt Planned Development Impact SOCIO #7: Temporary Disruption to Community Facilities from Construction
Parks, Recreation and Open Space										
PK-IAMF#1	Parks, Recreation, and Open Space	Prior to construction, the Contractor shall prepare and submit to the Authority a technical memorandum that identifies project design features to be implemented to minimize impacts on parks, recreation, and open space. Typical design measures to avoid or minimize impacts on parks and recreation may include: <ul style="list-style-type: none"> Provide safe and attractive access for present travel modes (e.g., motorists, bicyclists, pedestrians—as applicable) to existing park and recreation facilities. Design guideway, system, and station features in such a way as to enhance the surrounding local communities. Provide easy crossings of the guideway which allows for community use under the guideway or at station areas. 	Pre-construction	Reporting	At incorporation or completion of design/monthly reporting during construction	Contractor	Contractor	Prepare technical memorandum that documents project design features that minimize impacts to park, recreation, and open space	Condition of design-build contract	Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction Impact PK #3: Permanent Easements or Acquisition of Property from Parks, Recreation, and School Play Area Resources Due to Construction Impact PK #4: Changes to Planned Parks and Recreational Resources Due to Construction Impact PK #5: Changes to Park or Recreation Facility Use or Character Due to Operation Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction
Aesthetics and Visual Quality										
AVQ-IAMF#1	Aesthetic Options	Prior to construction, the Contractor shall document, through issue of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual impacts. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR non-station structures across the state. Examples of aesthetic options would be provided to local jurisdictions that can be applied to nonstandard structures in the HSR system. Refer to <i>Aesthetic Options for Non-Station Structures</i> , 2011.	Pre-construction	Reporting	At incorporation or completion of design/monthly reporting during construction	Contractor	Contractor	Prepare aesthetics technical memorandum	Condition of design-build contract	Impact AVQ #1: Visual Disturbance during Construction Impact AVQ #3: Visual Quality in the Burbank to Los Angeles Project Section Impact SOCIO #15: Permanent Disruption to Community Cohesion or Division of Existing Communities from Operation Impact PK #2: Air Quality, Noise, Vibration, and Visual Impacts during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
AVQ-IAMF#2	Aesthetics Review Process	Prior to construction, the Contractor shall document that the Authority's aesthetic review process has been followed to guide the development of non-station area structures. Documentation shall be through issuance of a technical memorandum to the Authority. The Authority would identify key non-station structures recommended for aesthetic treatment, consult with local jurisdictions on how best to involve the community in the process, solicit input from local jurisdictions on their aesthetic preferences, and evaluate aesthetic preferences for potential cost, schedule, and operational impacts. The Authority would also evaluate compatibility with project-wide aesthetic goals, include recommended aesthetic approaches in the construction procurement documents, and work with the Contractor and local jurisdictions to review designs and local aesthetic preferences and incorporate them into final design and construction. Refer to <i>Aesthetic Options for Non-Station Structures</i> , 2014.	Pre-construction	Reporting	At incorporation or completion of design/monthly reporting during construction	Contractor	Contractor	Prepare aesthetics review process technical memorandum	Condition of design-build contract	Impact AVQ #3: Visual Quality in the Burbank to Los Angeles Project Section Impact SOCIO #15: Permanent Disruption to Community Cohesion or Division of Existing Communities from Operation
Cultural Resources										
CUL-IAMF#1	Geospatial Data Layer and Archaeological Sensitivity Map	Prior to Construction (any ground-disturbing activities) and staging of materials and equipment, the Contractor's archaeologist or geoarchaeologist shall prepare a geospatial data layer identifying the locations of all known archaeological resources and built historic resources that require avoidance or protection, and areas of archaeological sensitivity that require monitoring within the area of potential effect (APE). The Contractor's archaeologist, who meets the Secretary of the Interior's Professional Qualifications Standards provided in 36 Code of Federal Regulations Part 61, is to use, as appropriate, a combination of the following: known locations of archaeological sites and built historic properties, tribal consultation, landforms, depositional processes, distance to water, mapping provided in the Archaeological Treatment Plan, or historic mapping. This mapping is to be updated as the design progresses if it results in an expansion of the area of ground disturbance/APE, including temporary construction easements and new laydown and access areas. This mapping would be used to develop an archaeological monitoring plan to be prepared by the Contractor's archaeologist, and upon approval by the Authority, implemented by the Contractor's archaeologist. When design is sufficiently advanced, a geospatial data layer would be produced by the Contractor overlaying the locations of all known archaeological resources and built historic resources within the APE, for which avoidance measures are necessary, and all archaeologically sensitive areas, for which monitoring is required.	Design/Pre-construction	Prepare plan	At incorporation or completion of design	Contractor's archaeologist or geoarchaeologist	Authority	Prepare geospatial data layer	Condition of design-build contract	Impact CUL #1: Construction Effects on Known Archaeological Resources Impact CUL #2: Construction Effects on Unknown Archaeological Resources Impact CUL #3: Construction Effects on Historic Built Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
CUL-IAMF#2	Worker Environmental Awareness Program (WEAP) Training Session	<p>Prior to Construction (any ground disturbing activity) construction contractor personnel who work on site would attend a WEAP training session provided by the Contractor. The WEAP would include cultural resources awareness training performed by the Contractor's archaeologist who meets the Secretary of the Interior's Professional Qualification Standards provided in 36 C.F.R. Part 61. The Contractor would develop instructional materials and a fact sheet for distribution to the construction crews, and submit the materials, as well as qualifications of the personnel providing the training, to the Authority for approval at least 15 days prior to being permitted onsite access. The training would address measures required to avoid or protect built historic resources, educate crews on artifacts and archaeological features they may encounter and the mandatory procedures to follow should potential cultural resources be exposed during construction. Translation services shall be provided by the Contractor for non-English speaking participants. The training sessions shall be given prior to the initiation of any ground disturbance activities and repeated on an annual basis. Additionally, new construction crewmembers shall attend an initial WEAP training session prior to working on site.</p> <p>On completion of the WEAP training, construction crews would sign a form stating that they attended the training, understood the information presented, and would comply with the WEAP requirements. The Contractor's archaeologist would submit the signed WEAP training forms to the Mitigation Manager on a monthly basis. On an annual basis, the Contractor would provide the Authority with a letter indicating that regular WEAP training has been implemented and would provide at least one PowerPoint annually of the WEAP training. On a monthly basis, the Contractor's archaeologist would provide updates and synopsis of the training to workers during the daily safety ("tailgate") meeting. Construction crews would be informed during the WEAP training that, to the extent possible, travel within the marked project site would be restricted to established roadbeds.</p>	Pre-construction	Training program/ Reporting	Prior to Construction (any ground-disturbing activity), then annual (training)/ monthly (reporting)	Contractor	Contractor	WEAP training	Condition of design-build contract	<p>Impact CUL #1: Construction Effects on Known Archaeological Resources</p> <p>Impact CUL #2: Construction Effects on Unknown Archaeological Resources</p> <p>Impact CUL #3: Construction Effects on Historic Built Resources</p>
CUL-IAMF#3	Preconstruction Cultural Resource Surveys	<p>Prior to Construction (any ground-disturbing activities in areas not yet surveyed) and the staging of materials and equipment, the Contractor shall conduct pre-construction cultural resource surveys. Resulting from lack of legal access, much of the construction footprint may not have been surveyed. Once parcels are accessible the Contractor would have archaeologists or architectural historians, as appropriate, who meet the Secretary of the Interior professional qualification standards survey and complete reporting in appropriate document for archaeology and / or built resources, in accordance with documentation</p>	Pre-construction	Conduct pre-construction surveys; Identify historic and/or cultural resources	Surveys conducted prior to ground disturbance	Contractor	Contractor	Cultural resource surveys conducted prior to ground disturbance	Condition of design-build contract	<p>Impact CUL #1: Construction Effects on Known Archaeological Resources</p> <p>Impact CUL #2: Construction Effects on Unknown Archaeological Resources</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		requirements stipulated in the Programmatic Agreement. Identified resources shall be evaluated for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR). The qualified archaeologist or architectural historian, as appropriate, would assess the potential to affect to historic properties (NRHP) by applying the effects criteria in 36 C.F.R. Part 800.5(a)(1), and the potential of significant impacts to historical resources (CRHR) by applying the criteria in California Environmental Quality Act (CEQA) Guidelines 15064.5(b). Should the Authority determine, in consultation with the State Historic Preservation Office (SHPO), that any newly identified historic properties or historical resources would be adversely affected, the Built Environment Treatment Plan or Archeological Treatment Plan, as appropriate, would be amended, to document mitigation measures agreed upon by the MOA signatories. The schedule of these surveys would be dependent on the timing of obtaining legal access to the properties and may be driven by the need to complete construction-related activities, e.g., geotechnical borings, laydown yards, etc. Prior to beginning surveys, updated records searches may be required by the Authority, depending on the length of the passage of time, to validate that accurate information was obtained regarding previous inventory and evaluation efforts. The Contractor's archaeologist, in consultation with the Authority, would determine if an updated records search is required. If an updated records search is necessary, the search shall be performed by the Contractor's archaeologist.								
CUL-IAMF#4	Relocation of Project Features when Possible	Changing the rail alignment to avoid newly discovered sites is likely infeasible; however, access areas and laydown sites may be relocated should their proposed location be found to be on archaeological sites or have the potential to affect historic built resources in the vicinity. The contractor would delineate all avoidance and protection measures for identified archaeological and built resources on construction drawings.	Construction	Relocation of access areas and laydown sites	As needed	Contractor	Contractor	Relocation access areas and laydown sites as needed to avoid archeological or historic built resources	Condition of design-build contract	Impact CUL #1: Construction Effects on Known Archaeological Resources Impact CUL #2: Construction Effects on Unknown Archaeological Resources
CUL-IAMF#5	Archaeological Monitoring Plan and Implementation	Prior to construction the Contractor's professionally qualified archaeologist, as defined in the Programmatic Agreement, would prepare a monitoring plan based on the results of geospatial data layer and archaeological sensitivity map. The plan is to be reviewed and approved by the Authority prior to any ground-disturbing activities. During Construction (any ground disturbing activities) or staging of materials or equipment, the Contractor would be responsible for implementing the monitoring plan and providing archaeological and tribal monitoring of ground-disturbing construction activities with a potential to affect archaeological remains in areas identified as archaeologically sensitive in the Archeological Treatment Plan. The Contractor shall obtain	Pre-construction/ Construction	Prepare and implement monitoring plan	Prior to construction (prepare plan)/ During construction (implement plan)	Contractor	Contractor	Prepare archaeological monitoring plan	Condition of design-build contract	Impact CUL #1: Construction Effects on Known Archaeological Resources Impact CUL #2: Construction Effects on Unknown Archaeological Resources

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		Authority approval of all persons providing archaeological or tribal monitoring.								
CUL-IAMF#6	Preconstruction Conditions Assessment, Plan for Protection of Historic Built Resources, and Repair of Inadvertent Damage	<p>Prior to Construction (any ground-disturbing activities that are within 1,000 feet of a historic built property) the Contractor may be required to assess the condition of construction-adjacent historic properties, and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage. The MOA and Built Environment Treatment Plan (BETP) would stipulate for which properties the plan is to be prepared. MOA signatories and consulting parties may comment on the adequacy of the assessments. Protection measures would be developed in consultation with the landowner or land-owning agencies as well as the SHPO and the MOA signatories and consulting parties, as required by the Programmatic Agreement. As the design progresses, additional properties may be identified by the Authority as requiring this plan. The plan shall record existing conditions in order to (1) establish a baseline against which to compare the property's post-project condition, (2) to identify structural deficiencies that make the property vulnerable to project construction related damage, such as vibration, and (3) to identify stabilization or other measures required to avoid or minimize inadvertent adverse effects. The plan would be further described in the BETP and be prepared by an interdisciplinary team, including (but not limited to) as appropriate, an architectural historian, architect, photographer, structural engineer, and acoustical engineer. Ambient conditions would be used to identify buildings that are sensitive receptors to construction-related vibration and require vibration monitoring during construction activities. Additional protective measures may be required if the property is vacant during construction. The plan content shall be outlined in the BETP and is to be completed and approved by the Authority, with protective measures implemented before construction begins within 1,000 feet of the subject building. The plan shall describe the protocols for documenting inadvertent damage (should it occur), as well as notification, coordination, and reporting to the SHPO, MOA signatories, and the owner of the historic property. The plan shall direct that inadvertent damage to historic properties shall be repaired in accordance with the Secretary of the Interior's (SOI) Standards for the Treatment of Historic Properties (U.S. Department of the Interior, 1995). The plan shall be developed in coordination with the Authority, and shall be submitted to the SHPO for review and approval. Protective plans would be required for buildings that would be moved as part of the project mitigation, including stabilization before, during, and after relocation; protection during</p>	Pre-construction	Conduct assessment and protection plan	Required if within 1,000 feet of historic built property	Contractor/ Authority	Contractor/ Authority	Assess the condition of construction-adjacent historic properties and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage	MOA/PA/BETP	<p>Impact CUL #3: Construction Effects on Historic Built Resources</p> <p>Impact AVQ #1: Visual Disturbance during Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		temporary storage; and relocation to a new site, followed by rehabilitation.								
CUL-IAMF#7	Built Environment Monitoring Plan	Prior to Construction (any ground-disturbing activities within 1,000 feet of a historic property or resource) the Contractor shall prepare a Built Environment Monitoring Plan (BEMP). Draft and final BEMP's would be prepared describing the properties that would require monitoring, the type of activities or resources that would require full-time monitoring or spot checks, the required number of monitors for each construction activity, and the parameters that would influence the level of effort for monitoring. Maximum vibration level thresholds may be established in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage the monitoring of which would be included in this monitoring plan. The BETP would outline the process for corrective action should the protection measures prove ineffective. Consultation procedures would also be defined in the BETP. The Contractor shall develop both the draft and final plans in coordination with the Authority, and shall be submitted to the SHPO for review and approval. The plan would be implemented prior to any ground-disturbing activities within 1,000 feet of properties identified as requiring monitoring, as specified in the BETP.	Pre-construction	Prepare monitoring plan	Prior to Construction (any ground-disturbing activities within 1,000 feet of a historic property or resource)	Contractor/ Authority	Contractor/ Authority	Prepare a BEMP	BETP	Impact CUL #3: Construction Effects on Historic Built Resources
CUL-IAMF#8	Implement Protection and/or Stabilization Measures	Implement the plan described in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage and in the Built Environment Treatment Plan. Such protection measures would include, but would not be limited to, vibration monitoring of construction in the vicinity of historic properties; cordoning off of resources from construction activities (e.g., traffic, equipment storage, personnel); shielding of resources from dust or debris; and stabilization of buildings adjacent to construction. Temporary stabilization and protection measures would be removed after construction is complete, and the historic properties would be restored to their preconstruction condition. For buildings that would be moved, treatment would include stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation.	Pre-construction	Implement protection and/or stabilization measures	Per BETP	Contractor	Contractor	Implement historic built resource protection measures per BETP	BETP	Impact CUL #3: Construction Effects on Historic Built Resources
Transportation										
TR-IAMF#1	Protection of Public Roadways during Construction	Prior to Construction, the Contractor shall provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the proposed project site and implement post-project remedial pavement preservation work that is needed to restore the affected roadways to their pre-project Pavement Management index conditions. The photographic survey shall be submitted for approval to the agency responsible for road maintenance and the Authority. The Contractor shall be	Pre-construction/ Post-construction	Survey/ Reporting	Immediately prior to and immediately following construction, and during construction as needed.	Contractor	Contractor	Provide a photographic survey	Condition of design-build contract	Impact TR #4: Circulation and Emergency Access Inadequacies during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		responsible for the repair of any structural damage to public roadways caused by HSR construction or construction access, returning any damaged sections to the equivalent of their original pre HSR construction structural condition or better. The Contractor shall survey the condition of the public roadways along truck routes providing access to the proposed project site after construction is complete. The Contractor shall complete a before- and after-survey report and submit it to the Authority for review, indicating the location and extent of any damage.								
TR-IAMF#2	Construction Transportation Plan	<p>The design-build contractor shall prepare a detailed Construction Transportation Plan (CTP) for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways in close consultation with the local jurisdiction having authority over the site. The Authority must review and approve the CTP before the Contractor commences any construction activities. This plan would address, in detail, the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The CTP would provide traffic controls pursuant to the <i>California Manual on Uniform Traffic Control Devices</i> sections on temporary traffic controls (Caltrans 2012) and would include a traffic control plan that includes, at a minimum, the following elements:</p> <ul style="list-style-type: none"> ▪ Temporary signage to alert drivers and pedestrians to the construction zone. ▪ Flag persons or other methods of traffic control. ▪ Traffic speed limitations in the construction zone. ▪ Temporary road closures and provisions for alternative access during the closure. ▪ Detour provisions for temporary road closures—alternating one-way traffic would be considered as an alternative to temporary closures where practicable and where it would result in better traffic flow than would a detour. ▪ Identified routes for construction traffic. ▪ Provisions for safe pedestrian and bicycle passage or convenient detour. ▪ Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practicable—where road closures are required 	Design/ Construction	Prepare plan/ Reporting	At incorporation or completion of design/ implementation during construction	Contractor	Contractor	Prepare and implement CTP	Condition of design-build contract	<p>Impact TR #1: Signalized Intersection Delay Increases during Construction</p> <p>Impact TR #2: Unsignalized Intersection Delay Increases during Construction</p> <p>Impact TR #3: Roadway Segment Volume-to-Capacity Ratio Changes during Construction</p> <p>Impact TR #4: Circulation and Emergency Access Inadequacies during Construction</p> <p>Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction</p> <p>Impact S&S #3: Increased Response Times for Fire, Rescue, and Emergency Services from Temporary Road Closures</p> <p>Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction</p> <p>Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		<p>during construction, limit to the hours that are least disruptive to access for the adjacent land uses.</p> <ul style="list-style-type: none"> Provisions for farm equipment access. Provisions for 24-hour access by emergency vehicles. Safe vehicular and pedestrian access to local businesses and residences during construction. The plan would provide for scheduled transit access where construction would otherwise impede such access. Where an existing bus stop is within the work zone, the design-builder would provide a temporary bus stop at a safe and convenient location away from where construction is occurring in close coordination with the transit operator. Adequate measures would be taken to separate students and parents walking to and from the temporary bus stop from the construction zone. Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to provide for the safety of schoolchildren. Review existing or planned Safe Routes to Schools with school districts and emergency responders to incorporate roadway modifications that maintain existing traffic patterns and fulfill response route and access needs during project construction and HSR operations. Identification and assessment of the potential safety risks of project construction to children, especially in areas where the project is located near homes, schools, daycare centers, and parks. Promotion of child safety within and near the project area. For example, crossing guards could be provided in areas where construction activities are located near schools, daycare centers, and parks. <p>CTPs would consider and account for the potential for overlapping construction projects.</p>								
TR-IAMF#3	Off-Street Parking for Construction-Related Vehicles	<p>The Contractor shall identify adequate off-street parking for all construction-related vehicles throughout the construction period to minimize impacts on public on-street parking areas. If adequate parking cannot be provided on the construction sites, the Contractor shall designate a remote parking area and arrange for the use a shuttle bus to transfer construction workers to/from the job site. This measure shall be addressed in the CTP.</p>	Design/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare CTP/Identify adequate off-street parking for all construction-related vehicles	Condition of design-build contract	<p>Impact TR #1: Signalized Intersection Delay Increases during Construction</p> <p>Impact TR #2: Unsignalized Intersection Delay Increases during Construction</p> <p>Impact TR #3: Roadway Segment Volume-to-Capacity Ratio Changes during Construction</p> <p>Impact TR #4: Circulation and Emergency Access Inadequacies during Construction</p> <p>Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction</p>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
TR-IAMF#4	Maintenance of Pedestrian Access	The Contractor shall prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Actions that limit pedestrian access would include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, provide covered walkways and fencing. The plan objective shall be to maintain pedestrian access where feasible (i.e., meeting design, safety, and Americans with Disabilities Act [ADA] requirements). This measure shall be addressed in the CTP.	Design/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare construction management plans that address maintenance of pedestrian access	Condition of design-build contract	Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction <i>Impact S&S #2: Accidents Associated with Construction-Related Detours</i> <i>Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction</i> <i>Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction</i>
TR-IAMF#5	Maintenance of Bicycle Access	The Contractor shall prepare specific construction management plans to address maintenance of bicycle access during the construction period. Actions that limit bicycle access would include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period. Maintain bicycle access where feasible (i.e., meeting design, safety, and ADA requirements). This measure shall be addressed in the CTP.	Design/ Construction	Prepare plan	Prior to construction	Contractor	Contractor	Prepare construction management plans that address maintenance of bicycle access	Condition of design-build contract	Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction Impact S&S #2: Accidents Associated with Construction-Related Detours Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction
TR-IAMF#6	Restriction on Construction Hours	The Contractor shall limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays to minimize impacts on traffic on roadways. The Contractor shall limit the number of construction employees arriving or departing the site between the hours of 7 a.m. and 8:30 a.m. and 4:30 p.m. and 6 p.m. Areas where these restrictions would be implemented would be determined as part of the CTP. Based on Authority review of the CTP, the restricted hours may be altered due to local travel patterns.	Construction	CTP to be prepared prior to construction followed by reporting	Prior to construction/ Weekly	Contractor	Contractor	Prepare CTP/ Limit construction materials deliveries and employee arrival and departures	Condition of design-build contract	Impact TR #1: Signalized Intersection Delay Increases during Construction Impact TR #2: Unsignalized Intersection Delay Increases during Construction Impact TR #3: Roadway Segment Volume-to-Capacity Ratio Changes during Construction Impact TR #4: Circulation and Emergency Access Inadequacies during Construction <i>Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction</i>

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
TR-IAMF#7	Construction Truck Routes	The Contractor shall deliver all construction-related equipment and materials on the appropriate truck routes and shall prohibit heavy-construction vehicles from using alternate routes to get to the site. Truck routes would be established away from schools, daycare centers, and residences, or along routes with the least impact if the Authority determines those areas are unavoidable. This measure shall be addressed in the CTP.	Construction	CTP to be prepared prior to construction followed by reporting.	Prior to construction/ Weekly	Contractor	Contractor	Prepare CTP/ Establish truck routes	Condition of design-build contract	Impact TR #1: Signalized Intersection Delay Increases during Construction Impact TR #2: Unsignalized Intersection Delay Increases during Construction Impact TR #3: Roadway Segment Volume-to-Capacity Ratio Changes during Construction Impact TR #4: Circulation and Emergency Access Inadequacies during Construction Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction Impact PK #1: Temporary Impact Areas, Temporary Access Restrictions, Temporary Facility Closures, or Temporary Detours during Construction
TR-IAMF#8	Construction during Special Events	The Contractor shall provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events that substantially (10 percent or more) increase traffic on roadways affected by project construction. Mechanisms include the presence of police officers directing traffic, special-event parking, use of within-the-curb parking, or shoulder lanes for through-traffic and traffic cones. This measure shall be addressed in the CTP.	Construction	CTP to be prepared prior to construction followed by reporting	Prior to construction/ Weekly	Contractor	Contractor	Prepare CTP/ Event coordination	Condition of design-build contract	Impact TR #1: Signalized Intersection Delay Increases during Construction Impact TR #2: Unsignalized Intersection Delay Increases during Construction Impact TR #3: Roadway Segment Volume-to-Capacity Ratio Changes during Construction Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction
TR-IAMF#9	Protection of Freight and Passenger Rail during Construction	The Contractor shall repair any structural damage to freight or public railways that may occur during the construction period and return any damaged sections to their original structural condition. If necessary, during construction, a "shoofly" track would be constructed to allow existing train lines to bypass any areas closed for construction activities. Upon completion, tracks would be opened and repaired; or new mainline track would be constructed, and the "shoofly" would be removed. Contractor repair responsibility would be included in the design-build contract.	Construction	Design-build and CTP to be prepared prior to construction followed by reporting	Weekly	Contractor	Contractor	Repair structural damage to freight or public railways	Condition of design-build contract	Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction
TR-IAMF#11	Maintenance of Transit Access	The Contractor shall prepare specific Construction Management Plans to address maintenance of transit access during the construction period. Actions that limit transit access include, but are not limited to, roadway lane closures or narrowing, closure or narrowing of streets that are designated transit routes, bus stop closures, bridge closures, placement of construction-related materials within designated transit lanes, bus stop or layover zones or along transit routes, and other actions that may affect the mobility or safety of bus transit during the construction period. A plan objective	Construction	Design-build and CTP to be prepared prior to construction followed by reporting	Prior to construction/ Weekly	Contractor	Contractor	Prepare Construction Management Plans to address maintenance of transit access	Condition of design-build contract	Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		shall be to maintain transit access where feasible (i.e., meeting design, safety, and ADA requirements). This measure shall be addressed in the CTP.								
TR-IAMF#12	Pedestrian and Bicycle Safety	Prior to construction, the Contractor shall provide a technical memorandum describing how pedestrian and bicycle accessibility would be provided and supported across the HSR corridor, to and from stations and on station property. Priority of safety for pedestrians and bicycles and vulnerable populations over motor vehicle access would be done in a way so as to encourage maximum potential access from non-motorized modes. Local access programs, such as Safe Routes to Schools, shall be maintained or enhanced. Access to community facilities for vulnerable populations shall be maintained or enhanced.	Pre-construction	Prepare technical memorandum	Prior to construction	Contractor	Contractor	Preparation of a pedestrian and bicycle accessibility technical memorandum	Condition of design-build contract	Impact TR #5: Design Feature Hazards, Incompatible Uses, or Conflict with Transit, Airport, Pedestrian, and Bicycle Plans during Construction Impact S&S #6: Motor Vehicle, Pedestrian, and Bicycle Accidents Associated with High-Speed Rail Operations Impact SOCIO #1: Temporary Disruption to Community Cohesion or Division of Existing Communities from Construction
Environmental Justice										
EJ-IAMF#1	Construction EJ Ombudsman/Business Spotighting	To avoid or minimize adverse impacts to residents, businesses, and community facilities in EJ communities during construction, the Authority will create an ombudsman position to address the needs of affected residents, businesses, and community facilities in those EJ communities adversely affected by construction impacts, including street closures and detours and noise and dust resulting from construction activities. The position will act as a single point of contact for residents, businesses, and community facility operators and users in EJ communities with potential adverse construction impacts. The EJ ombudsman shall ensure multilingual notices of upcoming vehicle, pedestrian, bicycle, and transit access disruptions and construction activities are mailed to affected EJ communities, shall ensure that the notices inform EJ communities of the Authority's hotline for reporting community concerns or complaints regarding construction noise and traffic impacts, shall work with the Authority's construction contractor to minimize effects to community members, and shall prepare a report (quarterly, at minimum) of all concerns and complaints received in EJ communities and measures taken by the Authority to address the complaints and concerns. In those cases when construction activities will disrupt access or make access inconvenient to businesses in EJ communities, the Authority shall provide assistance to those businesses to maintain visibility during construction, including providing signage and targeted advertising and marketing campaigns, incentives for construction worker patronage (as applicable), and Authority-sponsored community events.	Construction	Create ombudsman position	Ongoing during construction	Contractor	Contractor	Creation of an ombudsman position	Condition of design-build contract	Impact EJ #1: Changes to Traffic and Circulation Patterns during Construction
EJ-IAMF#2	EJ Community-Inclusive Process for Development of	The Authority shall follow its aesthetic options and aesthetic review procedures outlined in AVQ-IAMF#1 (Aesthetic Options) and AVQ-IAMF#2 (Aesthetic Review Process) for key non-station structures. In addition to seeking input from	Pre-construction	Reporting	At incorporation or completion of design/monthly	Contractor	Contractor	Prepare aesthetics technical memorandum	Condition of design-build contract	Impact EJ #8: Changes to Aesthetics and Visual Quality during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
	Aesthetic Treatments	the Cities of Burbank, Glendale, and Los Angeles on aesthetic preferences and to minimize adverse visual or related community cohesion impacts, the Authority shall also seek input on aesthetic preferences for potential treatments from the visually impacted EJ communities residing within the EJ resource study area in Los Angeles. Visually impacted communities and the EJ resource study area are defined in Chapter 5 of the FEIS/FEIR.			reporting during construction					
EJ-IAMF#3	Equity Noise Analysis	Prior to Construction, the Authority's Contractor will prepare an operation noise technical report for Authority review and approval, as described in N&V-MM#6. As described in N&V MM#3, sound treatments will be proposed to impacted receptors based on the recommendations in the approved noise impact report. To minimize EJ impacts, the final technical report will include an assessment of whether remaining severe noise impacts, after application of recommended noise treatments and mitigations, may continue to adversely impact EJ communities. If the report finds that adverse impacts may result, the Authority's contractor will prepare an additional report to assess whether any additional practicable measures may be undertaken to avoid, eliminate, or reduce the adverse noise impacts. The Authority will seek and consider the input of affected EJ sensitive receptors prior to finalizing the report, including the Taylor Yard community in Cypress Park on N San Fernando Road, generally between Arvia Street and Rio de Los Angeles State Park.	Pre-construction	Design	Prior to construction	Contractor	Contractor	Prepare an additional report to assess whether any additional practicable measures may be undertaken to avoid, eliminate, or reduce the adverse noise impacts	Submit assessment and supplemental environmental documentation	Impact EJ #12: Generation of Noise and Vibration during Operation
EJ-IAMF#4	EJ Relocation/Displacement Assistance	As described in SOCIO-IAMF#3 Relocation Mitigation Plan, the Authority will develop a relocation mitigation plan before any acquisitions occur, in consultation with affected cities and counties and property owners. The Plan will be designed to meet the objectives described in SOCIO-IAMF#3. To avoid or minimize adverse impacts in EJ communities in Los Angeles, the Plan will also include: (1) EJ Impact Minimization Measures: A description of measures taken or proposed to minimize adverse community cohesion effects of displacement and relocation on EJ communities, including a description of measures to relocate displacees (including tenants) in close proximity to their same community and an assessment of whether adverse EJ community cohesion effects remain after application of these measures; and (2) EJ Outreach: The Authority shall seek and consider input from impacted EJ communities prior to finalizing the Authority's Plan to minimize community cohesion effects of non-residential and residential displacements; and (3) EJ Ombudsman: Creation of an additional ombudsman's position to address needs of EJ communities identified in Los Angeles as adversely affected by displacements or relocations. The position will act as a single point of contact for property	Design/ Construction	Prepare plan	Prior to property acquisitions	Authority	Authority	Develop relocation mitigation plan	Condition of design-build contract	Impact EJ #6: Displacement of Persons or Businesses during Construction

IAMF	Title	IAMF Text	Phase	Implementation Action	Reporting Schedule	Implementation Party	Reporting Party	Implementation Text	Implementation Mechanism	Impact # and Impact Title
		owners, residents, and tenants in EJ communities with potential adverse relocation impacts. EJ communities are geographically defined and mapped in the findings of Chapter 5 of the FEIR/FEIS,								
EJ-IAMF#5	Community-Inclusive Process to Reroute Bike Paths in EJ Communities	As described in PR-MM#4, Replacement of Property Acquired from Existing or Planned Bicycle Routes, during the right-of-way acquisition process, the Authority will consult with the public agency with jurisdiction over any existing or planned bicycle routes regarding the specific conditions of acquisition and replacement of the land that will be acquired. To avoid or minimize adverse impacts to EJ communities from the relocation of planned or existing bike paths, the Authority will seek input from impacted EJ communities on the relocation of these bike paths.	Pre-construction	Final design/consultation	Prior to final design	Authority	Authority	Authority will seek input from impacted EJ communities on the relocation of these bike paths.	Condition of design-build contract	Impact EJ #15: Disruption to Parks, Recreation, and Open Space during Operation
AASHTO	American Association of State Highway and Transportation Officials		CWA	Clean Water Act			OSHA	Occupational Safety & Health Administration		
ADA	Americans with Disabilities Act		DOGGR	California Department of Conservation, Division of Oil, and Gas and Geothermal Resources			PCM	Project Construction Manager		
APLIC	Avian Power Line Interaction Committee		EMC	electromagnetic capability			Porter-Cologne	Porter-Cologne Water Quality Control Act		
AREMA	American Railway Engineering and Maintenance-of-Way Association		EMF	electromagnetic field			PRM	Paleontological Resource Monitors		
ASCE	American Society of Civil Engineers		EMI	electromagnetic interference			PRMMP	Paleontological Resources Monitoring and Mitigation Plan		
ASTM	American Society for Testing and Materials		EMMA	Environmental Mitigation Management and Assessment			PRS	Paleontological Resources Specialist		
APE	area of potential effects		ESA	Environmental Site Assessment			RCRA	Resource Conservation and Recovery Act		
Authority	California High-Speed Rail Authority		FAA	Federal Aviation Administration			RF	radio frequency		
BEMP	Built Environment Monitoring Plan		FESA	Endangered Species Act			SHPO	State Historic Preservation Office		
BETP	built environment treatment plan		FHWA	Federal Highway Administration			SOI	Secretary of the Interior		
BGEPA	Bald and Golden Eagle Protection Act		FRA	Federal Railroad Administration			SPCC	Spill Prevention, Control, and Countermeasure		
BMP	best management practice		FTA	Federal Transit Administration			SSPP	Systems Safety Program Plan		
BRMP	biological resources management plan		HSR	high-speed rail			SVP	Society of Vertebrate Paleontology		
Cal-OSHA	California Occupational Safety and Health Administration		IBC	International Building Code			SWPPP	Stormwater Pollution Prevention Plan		
Caltrans	California Department of Transportation		ISEP	Implementation Stage Electromagnetic Compatibility Program Plan			SWRCB	State Water Resources Control Board		
CARB	California Air Resources Board		IAMF	impact avoidance and minimization feature			TR	technical report		
CDFW	California Department of Fish and Wildlife		MBTA	Migratory Bird Treaty Act			Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended		
CEQA	California Environmental Quality Act		MOA	Memorandum of Understanding			USACE	U.S. Army Corps of Engineers		
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act		mph	miles per hour			USEPA	U.S. Environmental Protection Agency		
CESA	California Endangered Species Act		NIOSH	National Institute for Occupational Safety and Health			USFWS	U.S. Fish and Wildlife Service		
C.F.R.	Code of Federal Regulations		NMFS	National Marine Fisheries Service			VMT	vehicle miles traveled		
CMP	construction management plan		NO ₂	nitrogen dioxide			VOC	volatile organic compound		
CP	construction package		NOA	naturally occurring asbestos			WCP	Weed Control Plan		
CRHR	California Register of Historical Resources		NRHP	National Register of Historic Places			WEAP	Worker Environmental Awareness Program		
CTP	construction transportation plan		O&M	operations and maintenance						