ERRATA: APPENDIX 2-A, IMPACT AVOIDANCE AND MINIMIZATION FEATURES

Errata No.	Draft EIR/EIS Reference		Errata Final EIR/EIS	
	Section	Page	Correction and Rationale	Errata Page Reference
1	Air Quality	2-A-2	Revised AQ-IAMF#2 to clarify that the coatings used will be consistent with SCAQMD Rule 1113	16-204
2	Air Quality	2-A-3	Revised AQ-IAMF#5 to replace CARB's EMFAC 2017 with the latest USEPA-approved EMFAC	16-205
3	Transportation	2-A-36	Revised TR-IAMF#13 to clarify the activities that will be completed as a result of future stakeholder coordination	16-205
4	Station Planning, Land Use, and Development	2-A-26	Revised LU-IAMF#1 and LU-IAMF#2 to clarify that these IAMFs would apply to non-HSR passenger rail stations	16-205
5	Safety and Security	2-A-29	Revised SS-IAMF#2 to add that the Authority would also coordinate with rail operators and right-of-way owners to ensure that the HSR construction and operations are consistent with their safety and security plans	16-206

CARB = California Air Resources Board; EIR/EIS = environmental impact report/environmental impact statement; EMFAC = Emission Factors; HSR = high-speed rail; IAMF = impact avoidance and minimization features; No. = number; SCAQMD = South Coast Air Quality Management District; USEPA = U.S. Environmental Protection Agency

APPENDIX 2-A: IMPACT AVOIDANCE AND MINIMIZATION FEATURES

California High-Speed Rail Authority

Los Angeles to Anaheim Project Section

Draft
Project Environmental Impact Report/Environmental Impact Statement

Appendix 2-A
Impact Avoidance and Minimization Features

December 2025



CALIFORNIA High-Speed Rail Authority

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 22, 2024, and executed by the Federal Railroad Administration and the State of California.

ACRONYMS AND ABBREVIATIONS

Term	Definition
ASTM	ASTM International
Authority	California High-Speed Rail Authority
BETP	Built Environment Treatment Plan
BMP	best management practice
BRMP	Biological Resources Management Plan
CFR	Code of Federal Regulations
Caltrans	California Department of Transportation
CMP	Construction Management Plan
CP	construction package
CTP	Construction Transportation Plan
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	environmental site assessment
FAA	Federal Aviation Administration
FRA	Federal Railroad Administration
HSR	high-speed rail
IAMF	impact avoidance and minimization feature
O&M	operations and maintenance
PRMMP	Paleontological Resource Monitoring and Mitigation Plan
project section	Los Angeles to Anaheim Project Section
PRS	Paleontological Resources Specialist
SHPO	State Historic Preservation Officer
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended
WEAP	Worker Environmental Awareness Program

APPENDIX 2-A: IMPACT AVOIDANCE AND MINIMIZATION FEATURES

Definitions

Impact Avoidance and Minimization Features

The California High-Speed Rail Authority (Authority) and the Federal Railroad Administration (FRA) pledged to integrate programmatic impact avoidance and minimization features consistent with the (1) 2005 *Final Program Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) for the Proposed California High-Speed Train System*, (2) 2008 Bay Area to Central Valley Program EIR/EIS, and (3) 2012 Partially Revised Final Program EIR into the high-speed rail (HSR) project. The Authority will incorporate these features during project design and construction, as relevant to the Los Angeles to Anaheim Project Section (project section), to avoid or reduce impacts.

Impact avoidance and minimization features (IAMF) are incorporated into the project design and construction to avoid or minimize the environmental or community impacts. The description of each measure details the means and effectiveness of the measure in avoiding or minimizing impacts, as well as the environmental benefits of implementing the measure. For example, an IAMF can require the development of measures to reduce impacts on air quality and hydrology based on applicable design standards that will also reduce impacts on biological resources.

Each IAMF is described in the EIR/EIS. The factual basis for their efficacy, feasibility, and implementation is provided. The IAMFs are included in the Mitigation Monitoring and Enforcement Program to enhance implementation tracking, identify responsible party, and clarify implementation timing.

Descriptions of Impact Avoidance and Minimization Features

Air Quality[1]

AQ-IAMF#1: Fugitive Dust Emissions

During construction, the Authority-designated contractor shall employ the following measures to minimize and control fugitive dust emissions. The Authority-designated contractor shall prepare a fugitive dust control plan for each distinct construction segment. At a minimum, the plan will describe how each measure will be employed and identify an individual responsible for ensuring implementation. At a minimum, the plan will address the following components unless alternative measures are approved by the applicable air quality management district. Before finalizing the plan, the Authority-designated contractor shall provide a draft of the plan to any potentially affected public school districts on their request, for their review and comment.

- 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 washing 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.

[1] For components led by BNSF Railway, the Authority assumes AQ-IAMF#1 and AQ-IAMF#2 would be incorporated, but not AQ-IAMF#3, AQ-IAMF#4, or AQ-IAMF#5.

- Suspend any dust-generating activities when instantaneous wind speed exceeds 25 miles per hour.
- 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-designated contractor will use nonchemical 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-designated contractor will use nonchemical 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.
- 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.
- Before finalizing the plan, the Authority-designated contractor shall provide a draft of the plan to any potentially affected public school districts on their request, for their review and comment.

AQ-IAMF#2: Selection of Coatings

During construction, the Authority-designated contractor will use:

- Low-volatile organic compound paint that contains less than 10 percent of volatile organic compound contents (volatile organic compound, 10 percent).
- Super-compliant or Clean Air paint that has a lower volatile organic compound content than that required by South Coast Air Quality Management District Rule 1113, when available. If not available, the Authority-designated contractor will document the lack of availability, recommend alternative measure(s) to comply with Rule 1113 or disclose absence of measure(s) for full compliance and obtain concurrence from the Authority.

AQ-IAMF#3: Renewable Diesel

During construction, the Authority-designated contractor will 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 International (ASTM) D975 specification for Ultra Low Sulfur Diesel and have a carbon intensity no greater than 50 percent of diesel with the lowest carbon intensity among petroleum fuels sold in California. The Authority-designated contractor will provide the Authority with monthly and annual reports, through the Environmental Mitigation Management and Application 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 Authority-designated contractor must identify the quantity of traditional diesel purchased and fully document the availability and price of renewable diesel to meet project demand. The Authority assumes this measure would not be applicable to BNSF Railway–led project components.

AQ-IAMF#4: Reduce Criteria Exhaust Emissions from Construction Equipment

Prior to issuance of construction contracts, the Authority or contract administrator will incorporate the following construction equipment exhaust emissions requirements into the contract specifications:

1. All heavy-duty off-road construction diesel equipment used during the construction phase will meet Tier 4 Final engine requirements.
2. A copy of each unit's certified tier specification and any required California Air Resources Board or air pollution control district operating permit will be made available to the Authority at the time of mobilization of each piece of equipment.
3. The Authority-designated contractor will keep a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment.
4. The Authority-designated contractor will provide the Authority with monthly reports of equipment operating hours (through the Environmental Mitigation Management and Assessment system) and annual reports documenting compliance.

The Authority assumes this measure would not be applicable to BNSF Railway–led project components.

AQ-IAMF#5: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment

Prior to issuance of construction contracts, the Authority or contract administrator will incorporate the following material-hauling truck fleet mix requirements into the contract specifications:

1. All on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel, will consist of an average fleet mix of equipment model year 2020 or newer, but no less than the average fleet mix for the current calendar year as set forth in the California Air Resources Board's EMFAC 2017 database.[2]
2. The Authority-designated contractor will provide documentation to the Authority of efforts to secure such a fleet mix.
3. The Authority-designated contractor will keep a written record of equipment usage during project construction for each piece of equipment and provide the Authority with monthly reports of vehicle miles traveled (through the Environmental Mitigation Management and Assessment system) and annual reports documenting compliance.

The Authority assumes this measure would not be applicable to BNSF Railway–led project components.

Aesthetics and Visual Quality

AVQ-IAMF#1: Aesthetic Options

Prior to construction, the Authority-designated contractor shall document, through issuance of a technical memorandum, how the Authority's aesthetic guidelines have been employed to minimize visual effects. The Authority seeks to balance providing a consistent, project-wide aesthetic with the local context for the numerous HSR nonstation structures across the state. Examples of aesthetic options will be provided to local jurisdictions that can be applied to

[2] For the purposes of the Draft EIR/EIS and this General Conformity Determination, the Authority has revised AQ-IAMF#5 to commit to a fleet mix of equipment model year 2020 or newer. This commitment is quantified in the emissions calculations for the construction-phase hauling needs (specifically spoils hauling from tunneling activities). To maintain a conservative estimate of impacts, the emissions calculations for other project construction-phase hauling needs have not systematically taken credit for application of this measure.

nonstandard structures in the HSR system. Refer to *Aesthetic Options for Non-Station Structures*, 2017 (Authority 2017).

AVQ-IAMF#2: Aesthetic Review Process

Prior to construction, the Authority-designated contractor will document that the Authority's aesthetic review process has been followed to guide the development of nonstation area structures. Documentation will be through issuance of a technical memorandum to the Authority. The Authority will identify key nonstation 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 will also evaluate compatibility with project-wide aesthetic goals, include recommended aesthetic approaches in the construction procurement documents, and work with the Authority-designated contractor and local jurisdictions to review designs and local aesthetic preferences and incorporate them into final design and construction. Refer to *Aesthetic Options for Non-Station Structures, 2017*.

Biological Resources

BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors, and General Biological Monitors

At least 15 business days prior to commencement of ground-disturbing activity, including but not limited to geotechnical investigations, utility realignments, creation of staging areas, or initial clearing and grubbing, the Authority-designated contractor 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 to the wildlife agencies. No ground-disturbing activity will begin until the Authority-designated contractor has received written approval from the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, where applicable, and the California Department of Fish and Wildlife 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. 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-designated contractor is specified as implementing an IAMF, it is assumed that the Authority-designated contractor, or its Authority-designated contractor or agent, is implementing the IAMF under the supervision of biologists and Biological Monitors, as appropriate.

BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training

Prior to 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 vicinity of the project footprint. The WEAP training materials will be submitted to the Authority-designated contractor for review and approval. A video of the WEAP training

prepared and presented by the Project Biologist and approved by the Authority-designated contractor may be used if the Project Biologist is not available to present the training in person.

At a minimum, WEAP training materials will include the following information: key provisions of the federal Endangered Species Act, the California Endangered Species Act, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, California Fish and Game Code 1600, the Porter-Cologne Water Quality Control Act, and the Clean Water Act; the consequences and penalties for violation or 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; the contact person in the event of the discovery of a dead or injured wildlife species; and review of avoidance, minimization, and mitigation measures.

The Project Biologist will present WEAP training to 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 indicate 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 pre-existing and project-built unimproved and improved roads. A fact sheet conveying this information will be prepared by the Project Biologist for distribution to the construction crews and to 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. Construction staff will attend the WEAP training prior to beginning work on site and will attend the WEAP training on an annual basis thereafter.

On completion of the WEAP training, each member of the construction crew will sign a form stating that they attended the training, understood the information presented, and agreed to comply with the requirements set out in the WEAP training. The Project Biologist will submit the signed WEAP training forms to the Authority-designated contractor on a monthly basis. On an annual basis, the Authority-designated contractor will certify that WEAP training had been provided to 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.

BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training

Prior to initiating operations and maintenance (O&M) activities, O&M personnel will attend a WEAP training session arranged by the Authority-designated contractor.

At a minimum, O&M WEAP training materials will include the following information: key provisions of the Endangered Species Act, California Endangered Species Act, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, the Porter-Cologne Water Quality Control Act, and the Clean Water Act; the consequences and penalties for violation or 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 BRMP, 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-designated contractor environmental compliance staff will be prepared for distribution to the O&M employees. The training will be provided by the Authority-designated contractor environmental compliance staff. The training sessions will be provided to employees prior to their involvement in O&M activity and will be repeated for O&M employees on an annual basis. On 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.

BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan

Prior to ground-disturbing activity, the Project Biologist will prepare the Biological Resources Management Plan (BRMP), which will include a compilation of the biological resources avoidance and minimization measures applicable to the HSR section. Project environmental plans, such as the Restoration and Revegetation Plan and Weed Control Plan, 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 final design, construction, and operation phases. The BRMP will contain, but not be limited to, the following information:

- A master schedule that outlines construction of the project, preconstruction 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 Biologist(s) and Biological Monitor(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 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
- 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 on special-status species habitat compared to preconstruction impact estimates

The BRMP will be submitted to the Authority for review and approval prior to ground-disturbing activity.

BIO-IAMF#6: Establish Monofilament Restrictions

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.

BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations

At the end of each workday during construction, the Authority-designated contractor will cover 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) built 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 workday.

The Authority-designated contractor will screen, cover, or elevate at least 1 foot above ground, 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.

BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes

Prior to ground-disturbing activity, the Authority-designated contractor 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 temporary material storage areas) will be in areas occupied by permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. The Authority-designated contractor 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.

BIO-IAMF#9: Dispose of Construction Spoils and Waste

During ground-disturbing activities, the Authority-designated contractor may temporarily store excavated materials produced by construction activities in areas at or near construction sites within the project footprint. Where practicable, the Authority-designated contractor will return excavated soil to its original location to be used as backfill. Excavated waste materials unsuitable for treatment and reuse will be disposed of at an off-site location, in conformance with applicable state and federal laws.

BIO-IAMF#10: Clean Construction Equipment

Prior to ground-disturbing activity, the Authority-designated contractor will ensure that equipment entering the work area is free of mud and plant materials. The Authority-designated contractor 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 potential for the spread of weeds or other invasive species. Cleaning stations will be inspected regularly (at least monthly).

BIO-IAMF#11: Maintain Construction Sites and BMP Training

Prior to ground-disturbing activity, the Authority-designated contractor 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, nonstormwater management, waste management and materials control, rodenticide use, and other general construction site cleanliness measures, including trash control and removal.

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.

BIO-IAMF#12: Design the Project to Be Bird Safe

Prior to final construction design, the Authority-designated contractor will ensure that the catenary system, masts, and other structures such as fencing, electric lines, communication towers, and facilities are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (APLIC 2012). Applicable Avian Powerline Interaction Committee recommendations include, but are not limited to:

- Ensuring sufficient spacing of phase conductors to prevent bird electrocution
- Configuring lines to reduce vertical spread of lines or decreasing the span length if such options are feasible
- Marking lines and fences (e.g., Bird Flight Diverter for fencing and lines) to increase the visibility of lines and reduce the potential for collision. Where fencing is necessary, using bird-compatible design standards to increase visibility of fences to prevent collision and entanglement
- Installing perch guards to discourage avian presence on and near project facilities
- Minimizing the use of guywires. Where the use of guywires is unavoidable, demarcating guywires using the best available methods to minimize avian strikes (e.g., line markers)
- Reusing or co-locating new transmission facilities and other ancillary facilities with existing facilities and disturbed areas to minimize habitat impacts and avoid collision risks
- Using structures with monopole or dual-pole design versus lattice tower design to minimize perching and nesting opportunities. Communication towers will conform to Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning (USFWS 2021).
- Using facility lighting that does not attract birds or their prey to project sites. Best practices include using nonsteady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration (FAA) requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen). Lighting will not be installed under viaduct and bridge structures in riparian habitat areas.

Additional bird operational actions will be required for dry lakes and playas, Audubon Important Bird Areas and documented avian movement corridors. These measures include:

- Avoid, to the extent feasible, siting transmission lines across canyons or on ridgelines to prevent bird and raptor collisions.
- Install bird flight diverters on facilities spanning or within 1,000 feet of stream and wash channels, canals, ponds, and other natural or artificial body of water.
- Install fencing or other type of flight diverter on viaduct structures to encourage birds and raptors to fly over the HSR and avoid flying directly in the path of oncoming trains.
- Ensure poles do not have openings that could entrap birds. Measures may include sealing or capping openings in poles or providing for escape routes (e.g., openings accommodating escape for various species).
- Design aerial structures (e.g., viaducts and bridges) and tunnel portals to discourage birds and bats from roosting in expansion joints or other crevices.

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 Authority-designated contractor's archaeologist or geoarchaeologist will 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. The Authority-designated contractor's archaeologist, who meets the Secretary of the Interior's Professional Qualifications Standards provided in 36 Code of Federal Regulations (CFR) 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 historical mapping. This mapping is to be updated as the design progresses if it results in an expansion of the area of ground disturbance/area of potential effect, including temporary construction easements and new laydown and access areas. This mapping will be used to develop an archaeological monitoring plan to be prepared by the Authority-designated contractor's archaeologist and, on approval by the Authority, applied by the Authority-designated contractor's archaeologist. When design is sufficiently advanced, a geospatial data layer will be produced by the Authority-designated contractor overlaying the locations of all known archaeological resources and built historic resources within the area of potential effect for which avoidance measures are necessary, and all archaeologically sensitive areas for which monitoring is required.

CUL-IAMF#2: Worker Environmental Awareness Program Training Session

Prior to construction (any ground-disturbing activity), construction Authority-designated contractor personnel who work on site will attend a WEAP training session provided by the Authority-designated contractor. The WEAP will include cultural resources awareness training performed by the Authority-designated contractor's archaeologist or architectural historian who meets the Secretary of the Interior's Professional Qualification Standards provided in 36 CFR Part 61. The Authority-designated contractor will 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 on-site access. The training will address measures required to avoid or protect built historic resources, and to 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 will be provided by the Authority-designated contractor for non-English-speaking participants. The training sessions will be given prior to the initiation of any ground disturbance activities and repeated on an annual basis. Additionally, new construction crewmembers will attend an initial WEAP training session prior to working on site.

On completion of the WEAP training, construction crews will sign a form stating that they attended the training, understood the information presented, and will comply with the WEAP requirements. The Authority-designated contractor's archaeologist will submit the signed WEAP training forms to the Mitigation Manager on a monthly basis. On an annual basis, the Authority-designated contractor will provide the Authority with a letter indicating that regular WEAP training has been implemented and will provide at least one PowerPoint annually of the WEAP training. On a monthly basis, the Authority-designated contractor's archaeologist will provide updates and synopsis of the training to workers during the daily safety ("tailgate") meeting. Construction crews will be informed during the WEAP training that, to the extent possible, travel within the marked project site will be restricted to established roadbeds.

CUL-IAMF#3: Preconstruction Cultural Resource Surveys

Prior to construction (any ground-disturbing activities in areas not yet surveyed) and the staging of materials and equipment, the Authority-designated contractor will conduct preconstruction cultural resource surveys. Resulting from lack of legal access, much of the construction footprint may not have been surveyed. Once parcels are accessible the Authority-designated contractor

will have archaeologists or architectural historians, as appropriate, who meet the Secretary of the Interior's professional qualification standards, survey and complete reporting in appropriate document for archaeology or built resources, in accordance with documentation requirements stipulated in the Section 106 Programmatic Agreement. Identified resources will be evaluated for the National Register of Historic Places and the California Register of Historical Resources. The qualified archaeologist or architectural historian, as appropriate, will assess the potential to affect historic properties (National Register of Historic Places) by applying the effects criteria in 36 CFR Part 800.5(a)(1), and the potential of significant impacts on historical resources (California Register of Historical Resources) by applying the criteria in California Environmental Quality Act Guidelines 15064.5(b). Should the Authority and FRA determine, in consultation with the State Historic Preservation Officer (SHPO), that any newly identified historic properties or historical resources will be adversely affected, the Built Environment Treatment Plan (BETP) or Archaeological Treatment Plan, as appropriate, will be amended, to document mitigation measures agreed on by the memorandum of agreement signatories. The schedule of these surveys will 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). Prior to beginning surveys, updated records searches may be required by the Authority and FRA, depending on the length of the passage of time, to validate that accurate information was obtained regarding previous inventory and evaluation efforts. The Authority-designated contractor's archaeologist, in consultation with the Authority, will determine if an updated records search is required. If an updated records search is necessary, the search will be performed by the Authority-designated 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 Authority-designated contractor will delineate all of the applicable avoidance and protection measures as identified in the final treatment plans for identified archaeological and historic built resources on construction drawings prior to the start of construction. Additionally, as the design progresses, the Authority-designated contractor will site project features such as communication towers or other rail infrastructure to avoid and protect identified archaeological and built historic properties and historical resources. The Authority will establish regular coordination meetings with the Authority-designated contractor's qualified staff of archaeologists and architectural historians to ensure that the identified resources are avoided and the project designs have taken these resources into account.

CUL-IAMF#5: Archaeological Monitoring Plan and Implementation

Prior to construction, the Authority's professionally qualified archaeologist, as defined in the Section 106 Programmatic Agreement, will prepare a monitoring plan based on the results of geospatial data layer and archaeological sensitivity map. The plan will 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 Authority-designated contractor will be responsible for executing 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 Archaeological Treatment Plan. The Authority-designated contractor will obtain 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

Prior to construction (any ground-disturbing activities that are within 1,000 feet of a historic built resource), the Authority-designated contractor may be required to assess the condition of historic build resources adjacent to construction and prepare a Plan for the Protection of Historic Built Resources and Repair of Inadvertent Damage. The memorandum of agreement and BETP will

stipulate for which properties the plan is to be prepared. Memorandum of agreement signatories and Consulting Parties may comment on the adequacy of the assessments. Protection measures will be developed in consultation with the landowner or land-owning agencies as well as the SHPO and the memorandum of agreement signatories and Consulting Parties, as required by the Section 106 Programmatic Agreement. As the design progresses, additional properties may be identified by the Authority as requiring this plan. The plan will record existing conditions in order to (1) establish a baseline against which to compare the property's post-project condition, (2) identify structural deficiencies that make the property vulnerable to project-construction-related damage, such as vibration, and (3) identify stabilization or other measures required to avoid or minimize inadvertent adverse effects. The plan will 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 will 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 will 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 property. The plan will describe the protocols for documenting inadvertent damage (should it occur), as well as notification, coordination, and reporting to the SHPO, memorandum of agreement signatories, and the owner of the historic built resource. The plan will direct that inadvertent damage to historic built resources will be repaired in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (U.S. Department of the Interior 1995). The plan will be developed in coordination with the Authority and FRA, and it will be submitted to the SHPO for review and approval. Protective plans will be required for buildings that will be moved as part of the project mitigation, including stabilization before, during, and after relocation; protection during 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 Authority-designated contractor will prepare a Built Environment Monitoring Plan. Draft and final Built Environment Monitoring Plans will be prepared describing the properties that will require monitoring, the type of activities or resources that will require full-time monitoring or spot checks, the required number of monitors for each construction activity, and the parameters that will 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 will be included in this monitoring plan. The BETP will outline the process for corrective action should the protection measures prove ineffective. Consultation procedures will also be defined in the BETP. The Authority-designated contractor will develop both the draft and final plans in coordination with the Authority and FRA, and the plans will be submitted to the SHPO for review and approval. The plan will be implemented prior to any ground-disturbing activities within 1,000 feet of properties identified as requiring monitoring, as specified in the BETP.

CUL-IAMF#8: Implement Protection and/or Stabilization Measures

The Authority-designated contractor will implement the measures described in the Plan for Protection of Historic Resources and Repair of Inadvertent Damage and in the BETP. Such protection measures will include, but will not be limited to, vibration monitoring of construction in the vicinity of historic built resources; cordoning off of resources from construction activities (e.g., traffic, equipment storage, personnel); shielding of resources from dust or debris; and stabilization of buildings and structures adjacent to construction. The monitoring measures described in the BETP will ensure that protection measures are in place before construction begins. Additionally, monitoring during construction will verify that the protection measures are effective. For resources requiring vibration monitoring, the monitor will be responsible for setting up on-site vibration monitoring devices at the approximate location of the construction site; monitoring vibration levels

and issuing a temporary work stoppage if maximum vibration level thresholds are reached; implementing the procedures outlined in a vibration monitoring and control plan if construction activities result in vibration exceedances or an unanticipated impact occurs; reporting to the Authority any concerns or issues related to the historic built resources within the area of potential effects that may require further investigation; and documenting monitoring activities in a daily log and summarizing these activities in a monthly report. The Authority-designated contractor will submit the monitoring logs and monthly reports to the Authority as they are completed.

Temporary stabilization and protection measures will be removed after construction is complete, and the historic built resources will be restored to their preconstruction condition. For buildings that will be moved, treatment will include stabilization before, during, and after relocation; protection during temporary storage; and relocation to a new site, followed by rehabilitation.

Electromagnetic Fields/Electromagnetic Interference Standards

EMF/EMI-IAMF#1: Preventing Interference with Adjacent Railroads

TM 3.00.10. Implementation Stage Electromagnetic Compatibility Program Plan requires coordination with adjacent railroads. During project design, the Authority-designated contractor will work with the engineering departments of railroads that operate parallel the HSR to apply standard design practices to prevent interference with the electronic equipment operated by these railroads. Prior to O&M of each operating segment, the Authority-designated contractor will 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.

The Authority-designated contractor will 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 will 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 HSR Design Criteria Manual Chapter 26 summarizes the applicable electromagnetic interference/electromagnetic field design standards that the Authority will use for the project.

EMF/EMI-IAMF#2: Controlling Electromagnetic Fields/Electromagnetic Interference

Prior to construction, the Authority-designated contractor will prepare an electromagnetic field/electromagnetic interference technical memorandum for review and approval by the Authority. The HSR project will adhere to international guidelines and comply with applicable federal and state laws and regulations. The HSR project design will follow TM 300.10, Implementation Stage Electromagnetic Compatibility Program Plan, the HSR Design Criteria Manual Chapter 26, which provides detailed electromagnetic compatibility design criteria for the HSR systems and equipment, and the 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 HSR right-of-way. These documents describe the design practices to avoid electromagnetic interference and to provide for HSR operational safety. Some measures of the Authority's Implementation Stage Electromagnetic Compatibility Program Plan include:

- During the planning stage through system design, the Authority-designated contractor will perform electromagnetic compatibility/electromagnetic interference safety analyses, which will include identification of existing nearby radio systems, design of systems to prevent electromagnetic interference 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 will 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 will be implemented.

- HSR standard corrosion protection measures will be implemented to eliminate risk of substantial corrosion of nearby metal objects.

Community Analysis

CA-IAMF#1: Authority Community Ombudsperson and Contractor's Community Liaison

Prior to final design, the Authority shall create an ombudsperson position to address the needs of adversely affected communities. The Authority will also make available resources developed for community analysis IAMFs to any other affected communities that are identified in Chapter 5 of the EIR/EIS along the alignment, if a specific community so requests. The Authority's final design plans and contract documents shall require the contractor to establish a full-time community liaison to serve as a multilingual single point of contact for the eligible communities. The scope of the Authority's community ombudsperson and contractor's community liaison responsibilities and duties include those articulated in the other community analysis–related IAMFs. These responsibilities include implementing programs (e.g., the Workforce Development Program, community air quality monitoring), holding community roundtables to obtain ideas for business spotlighting, developing appropriate aesthetic treatments, proposing potential intersection or safety improvements, and obtaining community-specific feedback on the following plans not typically reviewed by the general public:

- Construction Management Plan (CMP) (SOCIO-IAMF#1)
- Relocation Mitigation Plan (SOCIO-IAMF#3)
- Construction Safety Transportation Management Plan (SS-IAMF#1)
- Safety and Security Management Plan (SS-IAMF#2)
- Operations Noise and Vibration Technical Memorandum (NV-IAMF#1)

The community ombudsperson and contractor's community liaison shall have stop-work authority in the event of safety concerns and may also apply stop-work authority for project-related concerns regarding fugitive dust, construction noise, and traffic (e.g., noncompliance with designated truck hauling routes and the California Transportation Plan). Beginning with final design and throughout the construction phase of the project, the contractor's community liaison shall submit reports (quarterly, at minimum) to the ombudsperson providing evidence of compliance with all community analysis IAMFs, maintenance of pedestrian access per TR-IAMF#4, communication of relocation mitigation plan, and relocation ombudsperson availability (SOCIO-IAMF#3). During construction, the contractor's community liaison shall provide multilingual notices (e.g., online information, e-blasts, text messaging, voice messaging, or mailers) to inform communities (specifically, communities identified in the first paragraph of this IAMF) of the Authority's hotline for reporting community concerns or complaints regarding construction noise and traffic effects and updates. These notices shall be provided 2 weeks in advance of each planned instance of vehicle, pedestrian, bicycle, transit access, and utility service disruption. Notices shall continue, at a minimum, until the communities receive post-construction guidance with details of how to access and ride the HSR system. The community liaison's report to the ombudsperson shall include all concerns and complaints received from communities and measures taken by the Authority or its contractors to address those concerns and complaints. The Authority's construction contractor shall implement all corrective actions communicated by the community ombudsperson, or their community liaison, within a 24-hour period unless written authorization from the community ombudsperson provides the contractor with an alternate timeline. The Authority shall ensure the point of contact has access to the Authority's contract interpretation and translation services for substantial Limited English Proficiency languages in the affected area. Substantial shall be as defined in state Limited English Proficiency law (the Dymally Alatorre Bilingual Services Act). The Authority may also consider contracting with a community organization for substantial Limited English Proficiency communities to assist with outreach.

CA-IAMF#2: Business Spotlighting

To minimize any potential access disruptions or inconveniences to businesses within adversely affected communities (as defined in CA-IAMF#1) during construction activities, the Authority shall provide assistance to those businesses to maintain visibility during construction, such as providing signage and targeted advertising and marketing campaigns, incentives for construction worker patronage (as applicable), or Authority-sponsored community events. Business spotlighting will include street vendors permitted by the City of Los Angeles.

CA-IAMF#3: Community-Inclusive Development of Aesthetic Treatments and Community Cohesion Enhancements

In addition to the requirements in AVQ-IAMF#1 and AVQ-IAMF#2, the contractor's community liaison shall work with the Authority community ombudsperson to hold community roundtables to seek input on locally desired aesthetic treatment preferences from the adversely affected communities (as defined in CA-IAMF#1), possibly developed by local artists. Treatment options may include streetscape, vegetation screening, consideration of a community mural, and beautification tree plantings or plant plantings (such as improvements to an existing community garden or establishment of a new community garden location). As appropriate, reuse of property purchased by the Authority that is within the communities (as defined in CA-IAMF#1) shall be considered for plant and tree plantings. Upon Authority review for compatibility with the Draft Design Opportunities for Local Jurisdictions and Aesthetic Requirements and approval, the identified locally desired aesthetic treatments shall be included in the final design plans. The Authority's contractor shall implement the aesthetic treatments in the construction of HSR infrastructure.

CA-IAMF#4: Business Relocation/Displacement Assistance

Pursuant to SOCIO-IAMF#3, the Authority will develop a relocation mitigation plan. The plan will include a subsection dedicated to addressing adverse effects to businesses in the communities (as defined in CA-IAMF#1). This subsection shall include a description of measures taken or proposed to offset the adverse effects of business displacements and relocations in communities, including a description of measures to relocate displaced businesses in proximity to their same community. The Authority shall hold community roundtable meetings to seek and consider input from affected communities prior to finalizing the Authority's Relocation Mitigation Plan.

Geologic Resources

GEO-IAMF#1: Geologic Hazards

Prior to construction, the Authority-designated contractor will prepare a CMP addressing how the Authority-designated contractor will address geologic constraints and minimize or avoid impacts related to geologic hazards during construction. This geologic hazard risk minimization plan will be submitted to the Authority for review and approval. The plan will address the following geological and geotechnical constraints/resources, with reference to the specific underlying standards set forth in the guidance and other manuals detailed in GEO-IAMF#10:

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-designated contractor 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 Authority-designated contractors for track bed preparation will conduct topographic surveys for preparation of final design. Because subsidence could have occurred since the original benchmarks (survey monuments) were established, the Authority-designated contractor's topographic surveys will be used to help determine whether subsidence has occurred. The updated topographic surveys will 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 is being given to overbuild the height of the railbed in anticipation of future subsidence.

d. Water and Wind Erosion: The Authority-designated contractor will implement erosion control methods as appropriate from the various erosion control methods documented in the Construction SWPPP (refer to HYD-IAMF#3), California Department of Transportation (Caltrans) Construction Manuals, 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.

e. Soils with Shrink-Swell Potential: In locations where shrink-swell potential is marginally unacceptable, soil additives will be mixed with existing soil to reduce the shrink-swell potential. Construction specifications will be based on 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.

f. Soils with Corrosive Potential: In locations where soils have a potential to be corrosive to steel and concrete, the soils will be removed and buried structures will be designed for corrosive conditions, and corrosion-protected materials will be used in infrastructure.

g. Faults: The Authority-designated contractor will identify and characterize faults as either Nonhazardous Faults, Potentially Hazardous Fault Zones, or Hazardous Fault Zones through a progressive process described in Technical Memorandum 2.10.6, titled *Fault Hazard and Mitigation Guidelines* (Parsons Brinkerhoff 2014). Technical Memorandum 2.10.6 provides guidelines for the identification, characterization, and resolution of displacement associated with faulting. A structural engineer will evaluate the potential for ground deformation, including fault-related folding, based on findings from the geotechnical investigation. The structural engineer will recommend appropriate design methods and engineering techniques to reduce or withstand potential geologic risks identified in the geotechnical investigation. These methods and techniques will be incorporated into the structural design to minimize the risk of permanent damage to structures or increased exposure of people to potential loss of life or injury from active fault-related folding. Potential strategies may include increased articulation at piers, simple spans with large and elongated bearing seats, enhanced derailment containment, seismic isolation and dissipation devices, monopile foundations at areas where the deformation zone is not well defined, and ductile and thickened reinforced mat concrete foundations.

GEO-IAMF#2: Slope Monitoring

During O&M, the Authority will incorporate slope monitoring by a Registered Engineering Geologist into the O&M procedures. The procedures will be implemented at sites identified in the 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.

GEO-IAMF#3: Gas Monitoring

Prior to construction, the Authority-designated contractor shall prepare a CMP addressing how gas monitoring will be incorporated into construction BMPs. The CMP will be submitted to the Authority for review and approval. Hazards related to potential migration of hazardous gases caused by the presence of known oil and gas fields, areas of active or historical landfills, or other subsurface sources can be reduced or eliminated by following strict federal and state Occupational Safety & Health Administration regulatory requirements for excavations, and by consulting with other agencies as appropriate, such as the California Geologic Energy Management Division, California Environmental Protection Agency, and Department of Toxic Substances Control, regarding known areas of concern.

Practices will 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 will be required in underground construction areas and facilities where subsurface gases are present. Installing gas-detection systems can monitor the effectiveness of these systems.

GEO-IAMF#6: Ground Rupture Early Warning Systems

Prior to construction, the Authority-designated 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 will 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 will be used to temporarily control trains, thus reducing accidents caused by fault creep. Damage to infrastructure from fault creep can be mitigated with routine maintenance including minor realignment.

GEO-IAMF#7: Evaluate and Design for Large Seismic Ground Shaking

Prior to construction, the Authority-designated 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 Authority-designated contractor will 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 will 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.

GEO-IAMF#8: Suspension of Operations During an Earthquake

Prior to O&M activities, the Authority-designated 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 will be incorporated into final design. Monitoring equipment will be installed at select locations where high ground motions could occur. The system will then be inspected for damage caused by ground motion or ground deformation, and then returned to service when appropriate.

GEO-IAMF#9: Subsidence Monitoring

Prior to O&M, the Authority will develop a stringent track monitoring program. Once tracks are operational, a remote monitoring program will be implemented to monitor the effects of ongoing subsidence. Track inspection systems will provide early warning of reduced track integrity. HSR train sets will be equipped with autonomous equipment for daily track surveys. This specification will be added to HSR train bid packages. If monitoring indicates that track tolerances are not met, trains will operate at reduced speeds until track tolerances are restored. In addition, the Authority-

designated contractor responsible for wayside maintenance will be required to implement a stringent program for track maintenance.

GEO-IAMF#10: Geology and Soils

Prior to construction, the Authority-designated contractor will document through issuance of a technical memorandum how the following guidelines and standards have been incorporated into facility design and construction:

- 2015 American Association of State Highway and Transportation Officials *LRFD Bridge Design Specifications* and the 2015 American Association of State Highway and Transportation Officials *Guide Specifications for LRFD Seismic Bridge Design* (AASHTO 2015a, 2015b) 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 will provide minimum specifications for evaluating the seismic response of the soil and structures.
- Federal Highway Administration 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. Methods to characterize geotechnical conditions at sites are found in Chapter 6, Geotechnical, of *Federal Lands Highway Project Development and Design Manual* (FHWA 2025). Methods for performing foundation design and recommendations on foundation construction are found in Chapter 10, Structural Design, of the Project Development and Design Manual. 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. The Federal Highway Administration *Geotechnical Technical Guidance Manual* (FHWA 2024) supports the policies, standards, and standard practices presented in Chapter 6 of the Project Development and Design Manual. Additionally, it provides guidance for activities where standards and standard practices do not exist, and it provides access to and guidance for the use of new technologies.
- American Railway Engineering and Maintenance-of-Way Association 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, 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 the 2015 International Building Code. This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. Geologic and soils hazards are discussed in Chapter 16, Structural Design, and Chapter 18, Soils and Foundations, of the 2019 California Building Code, Title 24, Part 2 (Volumes 1 and 2) with a January 2020 Errata (iccsafe.org).
- International Building Code and American Society of Civil Engineers-7: These codes and standards provide minimum design loads for buildings and other structures. They will be used for the design of the maintenance facilities and stations. Sections in the International Building Code and American Society of Civil Engineers-7 provide minimum requirements for geotechnical investigations, levels of earthquake ground shaking, minimum standards for structural design, and inspection and testing requirements.
- 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 (Caltrans 2024a), for design of mechanically stabilized earth walls used for retained fills (Caltrans 2021), and for design of various types of cantilever (e.g., soldier pile, secant pile, and tangent pile) (Caltrans 2024b), and tie-back walls used for retained cuts (Caltrans 2024c).

- 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 BMPs for dewatering options and management, erosion control and soil stabilization, nonstormwater management, and waste management at construction sites.
- 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

Prior to the 90 percent design milestone for each construction package[3] (CP) within the project section, the Authority-designated contractor will retain a Paleontological Resources Specialist (PRS) responsible for:

- Reviewing the final design for the CP
- Developing a detailed Paleontological Resources Monitoring and Mitigation Plan (PRMMP) for the CP
- Implementing the PRMMP by the PRS, including development and delivery of WEAP training, supervision of Paleontological Resource Monitors, evaluation and treatment of finds, if any, and preparation of a final paleontological mitigation report, per the PRMMP and for each CP

Retention of PRS staff will 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 feasible, the same PRS will be responsible for all CPs within a given project section.

All PRS staff will meet or exceed the qualifications for a Principal Paleontologist as defined in Caltrans current *Standard Environmental Reference*, Chapter 8 (Caltrans 2014). Appointment of PRS staff will 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 will evaluate the 90 percent design submittal to identify the portions of the CP that will 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 prepared for the project section. Evaluation will 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 potential for paleontological resources) of the CP and vicinity. The evaluation and resulting recommendations will be consistent with guidance in the Society of Vertebrate Paleontology (SVP) *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (SVP 2010), the *SVP Conditions of Receivership for Paleontologic Salvage Collections* (SVP 1996), and relevant guidance from Chapter 8 of the current Caltrans *Standard Environmental Reference* (Caltrans 2014).

The purpose of the Final Design Review and Triggers Evaluation will 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 will be recorded in a concise technical memorandum (“Final Design Review Requirements for Paleontological Resources Protection”), which will then be incorporated in full detail into the

[3] Because of their length and complexity, most HSR project sections are expected to be designed and built in segments, with separate construction documents (plans and specifications) developed for each segment. *Construction package* refers to a portion (segment) of a project section for which a discrete, stand-alone construction document set will be developed.

PRMMP for each CP. Those portions of the CP requiring paleontological monitoring will also be clearly delineated in the project construction documents for each CP.

GEO-IAMF#13: Prepare and Implement a Paleontological Resource Monitoring and Mitigation Plan

Following the Final Design Review and Triggers Evaluation for each CP, the PRS will 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 will incorporate the findings of the Design Review and Triggers Evaluation for that CP and will be consistent with the SVP's *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (SVP 2010), the SVP *Conditions of Receivership for Paleontologic Salvage Collections* (SVP 1996), and relevant guidance from Chapter 8 of the current Caltrans *Standard Environmental Reference* (Caltrans 2014). Therefore, the PRMMP will provide for at least the following:

- Implementation of the PRMMP by qualified personnel, including the following positions:
  - 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 2014). The Supervising Paleontologist may, but not necessarily, be the PRS who prepares the PRMMP.
  - Paleontological Resources Monitors: The PRS will be required to meet or exceed Paleontological Monitor qualifications per Chapter 8 of the current Caltrans *Standard Environmental Reference* (Caltrans 2014).
- Development of preconstruction and construction-period coordination procedures and communications protocols.
- Evaluation as to whether a preconstruction survey by qualified personnel is warranted for the CP. In general, preconstruction 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 will 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 paleontological resources monitors of all ground disturbance activities known to affect, or potentially affect, highly sensitive geologic units and for ground disturbance activities affecting other geologic units in any areas where the PRS considers it warranted based on the findings of the paleontological resources technical report or any preconstruction surveys. In all areas of the CP subject to monitoring, monitoring will initially be conducted full time for all ground disturbance activities. However, the PRMMP may provide for monitoring frequency in any given location to be reduced once approximately 50 percent of the ground disturbance activity has been completed, if the reduction is appropriate based on the implementing PRS's 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., smaller than 18 inches) drilling operations or drilling operations using bucket augers tend to pulverize affected sediments and any contained fossils and are typically not monitored. The section in the PRMMP addressing monitoring for drilling operations will rely, in part, on the information supplied by the CP design and geotechnical teams, but will also take into consideration the nature, depth, and location of drilling needed, and the anticipated equipment and staging configurations.
- Provisions for the content development and delivery of paleontological resources 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 SVP *Standard Procedures* (SVP 2010) and the SVP *Conditions of Receivership* (SVP 1996). Recovery procedures will 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 SVP *Conditions of Receivership* (SVP 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 Caltrans *Standard Environmental Reference* Chapter 8 provisions for the Paleontological Monitoring Report and Paleontological Stewardship Summary (Caltrans 2014).
- Provisions for the preparation, identification, analysis, and curation of fossil specimens and data recovered, consistent with the SVP *Conditions of Receivership* (SVP 1996) and any specific requirements of the designated repository institution(s).

GEO-IAMF#14: Provide Worker Environmental Awareness Program Training for Paleontological Resources

Prior to groundbreaking for each CP within the project section, the Authority-designated contractor will provide paleontological resources WEAP training delivered by the PRS. All management and supervisory personnel and construction workers involved with ground-disturbing activities will be required to take this training before beginning work on the project. Refresher training will also be made available to management and supervisory personnel and workers as needed, based on the judgment of the PRS.

At a minimum, paleontological resources WEAP Training will include information on:

- Coordination between construction staff and paleontological staff
- 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
- 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

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 will be subject to review and approval by the Authority. Paleontological resources WEAP Training may be provided concurrently with cultural resources WEAP Training.

On completion of any WEAP training, the Authority-designated contractor will require workers to sign a form stating that they attended the training and understand and will comply with the information presented. Verification of paleontological resources WEAP training will be provided to the Authority by the Authority-designated contractor.

GEO-IAMF#15: Halt Construction, Evaluate, and Treat If Paleontological Resources Are Found

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 will halt and the find will be protected from further disturbance. If the discovery is made by someone other than the PRS or paleontological resource monitor(s), the person who made the discovery will immediately notify construction supervisory personnel, who will in turn notify the PRS. Notification to the PRS will take place promptly (prior to the close of work the same day as the find), and the PRS will evaluate the find and prescribe appropriate 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.

If the PRS determines that treatment (i.e., recovery and documentation of unearthed fossil[s]) is warranted, such treatment, and any required reporting, will proceed consistent with the PRMMP. The Authority-designated contractor will 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 will apply. The PRS will coordinate with construction supervisory and drilling staff regarding the handling of recovered fossils.

The requirements of this IAMF will be detailed in the PRMMP and presented as part of the paleontological resources WEAP training.

Hazardous Materials and Waste

HMW-IAMF#1: Property Acquisition Phase I and Phase II Environmental Site Assessments, Additional Preconstruction Investigations, and Associated Actions to Control Site Contamination

During the right-of-way acquisition phase, Phase I environmental site assessments (ESA) will be conducted in accordance with standard ASTM methodologies, ASTM E 1527-21, or more recent applicable requirements, to characterize each parcel, including parcels at potential environmental concern sites. Parcels that require a Phase II ESA (e.g., soil, groundwater, soil vapor subsurface investigations) will be identified using information and data obtained in the Phase I ESAs. Phase II and subsequent investigation may require coordination with federal, state, and local agency officials, as well as other stakeholders. Depending on the arrangement negotiated during property acquisition, potential environmental concern sites with known or suspected contamination may be remediated prior to construction on the site. For sites that are not remediated prior to acquisition, data obtained during the Phase I ESA will be used to evaluate the need for and the extent of additional investigation. The Phase II ESA and any additional characterization data collected will be used to inform aspects of detailed project design and actions required during construction and operation of the project to protect human health and the environment from contaminants present on the parcels (e.g., targeted removal of contamination, in-situ treatment, or soil capping). Project design details for construction at sites subject to cleanup or land use controls will be reviewed and approved by appropriate environmental oversight agencies. Design and other corrective actions required to protect human health and the environment will be coordinated with appropriate federal, state, and local agency officials and stakeholders (as necessary) and conducted in full compliance with recorded land use restrictions, applicable state and federal laws and regulations, and local ordinances. Controls necessary to protect workers, the public, and the environment from contamination discovered during the ESAs and preconstruction site investigations will be identified and are required to be implemented during construction in accordance with HMW-IAMF#4.

HMW-IAMF#2: Landfill

The Authority is committed to ensuring that methane protection measures will be implemented. Prior to construction (any ground-disturbing activities), the Authority-designated contractor will verify to the Authority through preparation of a technical memorandum that methane protection measures will be implemented for all work (including the development of new structures) within 1,000 feet of a landfill, including gas-detection systems and personnel training. This will be undertaken pursuant to State of California Title 27, Environmental Protection – Division 2, Solid Waste, and the hazardous materials BMP plan.

HMW-IAMF#3: Work and Vapor Barriers

Prior to construction (any ground-disturbing activities), the Authority-designated contractor will 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. Vapor barriers and associated venting systems determined to be necessary to prevent intrusion of hazardous concentrations of volatile compounds into occupied project structures (e.g., stations, tunnels) will be designed in accordance with standard engineering practices and reviewed and accepted by relevant stakeholders and regulatory agencies. Existing vapor barriers for controlling vapor intrusion at potential environmental concern sites will be protected during construction and, if damaged, will be repaired or replaced in accordance with discussions and coordination with relevant stakeholders and regulatory agencies.

HMW-IAMF#4: Known, Suspected, and Unanticipated Environmental Contamination

The Authority, or its Authority-designated design contractor, prior to completion of 30 percent design, will develop a soil management plan that incorporates information and data regarding known and suspected contamination obtained per HMW-IAMF#1. The plan will include requirements for protection of human health and the environment to be implemented by the Authority-designated construction contractor during construction on sites at which contamination is or may be present. The soil management plan will be reviewed and approved by appropriate agencies with oversight responsibilities for sites subject to cleanup or land use controls and will be provided to the Authority-designated construction contractor, who shall be contractually obligated to meet the plan requirements.

Prior to construction the Authority-designated construction contractor, in accordance with the soil management plan, will prepare a CMP addressing provisions for the disturbance and handling of known, suspected, and unanticipated contamination; and protection of existing remedial systems and contamination controls (e.g., vapor barriers) where construction may affect or damage such systems and controls. The plan requires that an environmental professional provide oversight of activities that may result in encountering known or suspected contamination. The CMP shall require the Authority-designated contractor to develop and implement site-specific health and safety protocols that address site hazards in compliance with California Division of Occupational Safety and Health regulations for handling contaminated media, including training of construction workers in hazard recognition and monitoring for hazardous contaminants to which workers may be exposed in areas where contamination is known or suspected based on data obtained under HMW-IAMF#1. Use of field screening equipment will be specified as appropriate based on data obtained under HMW-IAMF#1 (e.g., for volatile organic vapors). The CMP shall include specifications for controlling releases of contaminants or contaminated media during construction, including dust control, control of soil erosion and contaminated water runoff, vapor control, and testing and proper storage and disposal of excavated material. The CMP will include an effective monitoring and cleanup program for spills and leaks of any hazardous materials or contaminated media. Requirements for sampling and analysis of media suspected to be contaminated shall be included in the CMP.

For work at sites subject to contaminant cleanup, the CMP will be submitted, as required, to regulatory agencies with oversight authority for the cleanup and to stakeholders. The CMPs include requirements for notification by the Authority-designated contractor to the Authority, which will notify appropriate stakeholders and agencies of newly discovered contamination. The Authority will work closely with the stakeholders and regulatory agencies to resolve any such encounters and address necessary cleanup or disposal. Recordkeeping requirements will be specified in the CMP. For operations in areas with known and suspected contamination, the Authority will prepare and implement emergency response procedures that address the unlikely potential of a major hazardous materials release close to or in the vicinity of the project as required by federal, state, and local regulations. The CMP will be submitted to the Authority for review and approval.

Copies of all documentation generated in accordance with the CMP, including monitoring and analytical results, will be provided to the Authority within 30 days of receipt of analytical results or encountering of apparent contaminated media (soil, groundwater, or vapor).

HMW-IAMF#5: Demolition Plans

Prior to construction that involves demolition, the Authority-designated contractor will prepare demolition plans for the safe dismantling and removal of building components and debris. The demolition plans will include a plan for polychlorinated biphenyls, lead and asbestos abatement. The plans will be submitted to the project construction manager 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.

HMW-IAMF#6: Spill Prevention

Prior to construction (any ground-disturbing activities), the Authority-designated contractor will prepare a CMP addressing spill prevention. A Spill Prevention, Control, and Countermeasure plan (or spill 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) will prescribe BMPs to follow to prevent hazardous material releases that may occur. Example BMPs would be: all containers are to remain tightly covered unless removing contents/adding to them; drums and other contains are not to be stacked; all containers with liquids are to have secondary containment; and a spill response/containment kit is to be available in the area where hazardous materials are stored. The plans will be prepared and submitted to the project construction manager on behalf of the Authority and will be implemented during construction.

HMW-IAMF#7: Storage and Transport of Materials

During construction and operations, the Authority-designated contractor will comply with applicable state and federal regulations, such as the Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation, and Liability Act, the Hazardous Materials Release Response Plans and Inventory Law, the Hazardous Materials Transportation Act, and the Hazardous Waste Control Law. Prior to construction and operations, the Authority-designated contractor will provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous materials transport.

HMW-IAMF#8: Permit Conditions

During construction and operation, Authority-designated contractors will 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 and operation, Authority-designated contractors will provide the Authority with a hazardous materials and waste plan describing responsible parties and procedures for hazardous materials transport, containment, and storage BMPs that will be implemented during construction and operation.

HMW-IAMF#9: Environmental Management System

To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous materials in the material selection process for construction, operation, and maintenance of the HSR system. The Authority will use an Environmental Management System to describe the process that will be used to evaluate the full inventory of hazardous materials as defined by federal and state law employed on an annual basis and will replace hazardous materials with nonhazardous materials. The Authority-designated contractor will implement the material substitution recommendation contained in the annual inventory.

HMW-IAMF#10: Hazardous Materials Plans

Prior to O&M activities, the Authority will prepare hazardous materials monitoring plans. These will use a basis source, such as a hazardous materials business plan as defined in Title 19 California Code of Regulations and a spill prevention, control, and countermeasure plan.

Hydrology and Water Resources

HYD-IAMF#1: Stormwater Management

Prior to construction, the Authority-designated contractor will prepare a stormwater management and treatment plan in compliance with municipal separate storm sewer systems and construction general permits, issued by the State Water Resources Control Board for review and approval by the Authority. During the detailed design phase, each receiving stormwater system's capacity to accommodate project runoff will be evaluated. As necessary, on-site stormwater management measures, such as detention or selected upgrades to the receiving system, will be designed to provide adequate capacity and comply with the design standards in the latest version of Authority Technical Memorandum 2.6.5, *Hydraulics and Hydrology Guidelines* (Authority 2011a), HSR Design Criteria Manual, Caltrans *Stormwater Quality Handbook: Project Planning and Design Guide* (Caltrans 2017), and the requirements stated in the applicable state and local National Pollutant Discharge Elimination System permits and guidelines. On-site stormwater management facilities will be designed and built to capture runoff and provide treatment of pollutant-generating surfaces prior to discharge off site, including from station parking areas, access roads, new road over- and underpasses, reconstructed interchanges, and new or relocated roads and highways. Low-impact development techniques will be used to detain runoff on site and reduce off-site runoff, such as through use of built wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips, which will be used where appropriate. The stormwater management and treatment plan will also address hydromodification such that preproject hydrology is maintained. Hydromodification design measures will include incorporating on-site retention of stormwater runoff by using flow dispersion, infiltration, and evaporation (supplemented by detention where required). Additional flow control measures will be implemented where local regulations or drainage requirements dictate.

HYD-IAMF#2: Flood Protection

Prior to construction, the Authority-designated contractor will prepare a flood protection plan for Authority review and approval. The flood protection plan will be prepared to ensure that the project is designed to both remain operational during flood events and minimize increases in 100-year flood elevations. The Authority-designated contractor will be responsible for implementation of the design standards as presented in the flood protection plan. Design standards, as itemized in the flood protection plan, will include the following:

- Establish track elevation to prevent saturation and infiltration of stormwater into the sub-ballast.
- Minimize development within the floodplain to such an extent that the water surface elevation in the floodplain will not increase by more than 1 foot, or as required by state or local agencies, during the 100-year flood flow. Avoid placing facilities in the floodplain or raising the ground with fill above the base-flood elevation.

- 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 ensure project features within the floodway itself will not increase existing 100-year floodwater surface elevations in Federal Emergency Management Agency–designated floodways or as otherwise agreed on with the local county flood control district floodplains manager.

The following design standards will minimize the effects of pier placement on floodplains and floodways:

- 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, complemented with native riparian plantings or other natural stabilization alternatives that will 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 streamflow velocity.

HYD-IAMF#3: Prepare and Implement a Construction Stormwater Pollution Prevention Plan

Prior to construction (any ground-disturbing activities), the Authority-designated contractor shall comply with the State Water Resources Control Board Construction General Permit requiring preparation and implementation of a SWPPP. The SWPPP will be prepared by a qualified SWPPP developer and reviewed and approved by the Authority's environmental manager. The Construction SWPPP will 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 will include measures to incorporate permeable surfaces into facility design plans where feasible, and describe how treated stormwater will be retained or detained on site. Other BMPs will include strategies to manage the amount and quality of overall stormwater runoff. The construction SWPPP will include measures to address, but is not limited to, the following:

- Hydromodification management to verify maintenance of preproject hydrology by emphasizing on-site retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation (supplemented by detention where required); additional flow control measures will be implemented where local regulations or drainage requirements dictate.
- 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 requiring daily checks of 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 or hazardous material spills.
- Implementing a SWPPP by the construction Authority-designated contractor as directed by the Authority-designated contractor's QSP or designee. The qualified SWPPP developer will report all findings to the Authority-designated contractor's environmental manager. 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 are submitted to the local RWQCB as part of the annual report required by the Statewide Construction General Permit. The reports are available to the public online. The State Water Resources Control Board and regional water quality control board will have the opportunity to review these documents.

HYD-IAMF#4: Prepare and Implement an Industrial Stormwater Pollution Prevention Plan

Prior to construction of any facility classified as an industrial facility (e.g., vehicle maintenance facilities), the Authority-designated contractor will comply with existing industrial stormwater quality regulations. The general permit for stormwater discharges associated with industrial activities, National Pollutant Discharge Elimination System No. CAS000001, requires preparation of an industrial SWPPP by a qualified industrial SWPPP preparer and a monitoring plan for industrial facilities that discharge stormwater from the site, including vehicle maintenance facilities associated with transportation operations. The permit includes performance standards for pollution control. The industrial SWPPP will describe the facility functions, treatment BMPs, operations BMPs, inspection and monitoring activities, and recordkeeping that will be implemented during the facility operations as they pertain specifically to stormwater. The SWPPP will be designed to:

1. Protect existing water quality and comply with the industrial National Pollutant Discharge Elimination System permit.
2. Identify activities that have the potential to cause surface water or groundwater contamination and the BMPs required to reduce, eliminate, or prevent contamination.

The Authority-designated contractor will provide a fully trained and certified Qualified Industrial Storm Water Practitioner to assist with compliance with and implementation of this permit.

Station Planning, Land Use, and Development

LU-IAMF#1: HSR Station Area Development: General Principles and Guidelines

Prior to O&M, the Authority-designated contractor will prepare a memorandum for each station describing how 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.

LU-IAMF#2: Station Area Planning and Local Agency Coordination

Prior to O&M, the Authority-designated contractor will 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.

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 Authority-designated 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 Authority-designated contractor will submit the restoration plan to the Authority for review and obtain Authority approval. The restoration plan will include time-stamped photo documentation of the preconstruction conditions of all temporary staging areas. All construction access, mobilization, material laydown, and staging areas will be returned to a condition equal to the preconstruction staging condition. This requirement is included in the design-build construction contract requirements.

Noise and Vibration

NV-IAMF#1: Noise and Vibration

Prior to construction, the Authority-designated contractor shall prepare and submit to the Authority a noise and vibration technical memorandum documenting how the Federal Transit Administration and FRA guidelines for minimizing construction noise and vibration impacts will be employed when work is being conducted within 1,000 feet of sensitive receptors. Typical construction practices contained in the Federal Transit Administration and FRA guidelines for minimizing construction noise and vibration impacts include the following:

- Build noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise sensitive resources.
- Route truck traffic away from residential streets, when possible.
- Build walled enclosures around especially noisy activities or around clusters of noisy equipment.
- Combine noisy operations so that they occur in the same period.
- To reduce vibration, phase demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period. Unlike noise, the total vibration level produced could be significantly less when each vibration source operates separately.
- Avoid impact pile driving where possible in vibration sensitive areas.

Parks, Recreation, and Open Space

PK-IAMF#1: Parks, Recreation, and Open Space

Prior to construction, the Authority-designated 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 during construction and operation. Typical design measures to avoid or minimize impacts on parks and recreation may include:

- 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.

Public Utilities and Energy

PUE-IAMF#1: Design Measures

The HSR project design incorporates utilities and design elements that minimize impacts on public utilities. A key objective is to 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). Therefore, the project will not overburden electric utility services during construction or operation. These design elements are included in the design-build contract. Additionally, the Authority has adopted a sustainability policy (POLI-1007) that establishes project design and construction requirements that avoid and minimize impacts on public utilities. The policy commits the Authority to work toward net-zero water consumption during operations with compliance with the California Green Building Standards Code and net-zero energy consumption, with facilities Leadership in Energy Environmental Design–certified at the platinum level. The Authority also has committed to using 100 percent renewable energy for operation.

During construction, the policy calls for implementing the following:

- Follow construction waste practices that divert at least 85 percent of waste from landfill, unless the local regulation is higher.
- Recycle all steel and concrete waste generated.
- Reduce potable water use.
- Maximize the use of renewable transportation fuels.
- In compliance with the International Standards Organization 14001 standard, the Authority's contract requirements for the design-build Authority-designated contractor will be monitored throughout construction, performance data collected through the EMMA database, and data compiled into annual reports for verification and continuous improvement of sustainability practices, including minimizing impacts on public utilities.

The Authority, or Authority-designated contractor, shall comply with the Authority's Sustainability Policy in effect at the time of contracting (e.g., POLI-1007).

PUE-IAMF#3: Public Notifications

Prior to construction in areas where utility service interruptions are unavoidable, the Authority will obtain written consent from utility owners prior to construction consistent with the HSR Design Criteria Manual Chapter 28, Utilities, Section 28.2.2.3.4, Level of Service and Service Interruptions. The Authority-designated contractor will 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 will specify the estimated duration of the planned outage and will be published no less than 7 days prior to the outage. Construction will be coordinated to avoid interruptions of utility service to hospitals and other critical users. The Authority-designated contractor will 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.

PUE-IAMF#4: Utilities and Energy

Prior to construction, the Authority-designated contractor will prepare a technical memorandum documenting how construction activities will be coordinated with utility service providers to minimize or avoid planned and accidental temporary interruptions. It will include upgrades of existing power lines to connect the HSR system to existing utility substations. The memorandum will identify all affected utility service providers, proposed coordination activities before and during construction, as well as the location of all known underground utilities. The technical memorandum will be provided to the Authority for review and approval prior to the start of coordination with any utility service providers. Confirmation of existing utilities will be conducted

with all utility service providers consistent with the HSR Design Criteria Manual Section 28.2.2.3.2, Utility Verification Request to Owner. In addition, the Authority-designated contractor and each utility service provider will agree on the best ways to coordinate during construction for all planned and accidental interruptions of utility service. Following these initial Authority-designated contractor coordination activities with the utility service providers, the Authority-designated contractor will prepare a second technical memorandum to document the location of confirmed utility infrastructure that will be affected by construction activities consistent with the HSR Design Criteria Manual Chapter 28, Utilities, and California Government Code Section 4215 as well as the negotiated protocols the Authority-designated contractor will use to coordinate during construction with each affected utility service provider. This technical memorandum will be reviewed and approved by the Authority.

Safety and Security

SS-IAMF#1: Construction Safety Transportation Management Plan

Prior to construction (any ground-disturbing activity), the Authority-designated contractor will prepare for submittal to the Authority a construction safety transportation management plan. The plan will describe the Authority-designated contractor's coordination efforts with local jurisdictions for maintaining emergency vehicle access. The plan also will address duration of road and traffic lane closures, length of detour routes, and ongoing coordination during construction with local jurisdictions as well as emergency service providers. The plan will also specify the Authority-designated 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 Authority requires the Authority-designated contractor to maintain emergency vehicle access and access for nearby residences and business throughout the duration of construction. The Authority-designated contractor will prepare and submit monthly reports to the Authority documenting Construction Transportation Plan (CTP) implementation activities for compliance monitoring.

SS-IAMF#2: Safety and Security Management Plan

The Authority will require the Authority-designated contractor to prepare a safety and security management plan that complies with the below-listed requirements to protect public safety and security. Sixty days after receiving from the Authority a construction notice to proceed, the Authority-designated contractor shall provide the Authority with a technical memorandum documenting how the following requirements, plan, 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 Authority-designated 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.

- Workplace worker safety is generally governed by the Occupational Health and Safety Act of 1970, which established the Occupational Health and Safety Administration. The Occupational Health and Safety Administration establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, Occupational Health and Safety Administration enforcement of workplace requirements is performed by California Occupational Safety and Health Administration. Under California Occupational Health and Safety Administration regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program.
- The Authority has adopted the California High-Speed Rail Program Safety and Security Management Plan (Authority 2018) 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 and a Security and Emergency Preparedness Plan will 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 Authority-designated contractor will provide the Authority with a Safety and Security Management Plan documenting how they will apply the Authority's safety and security requirements within their project scope.
- Implement site-specific health and safety plans and site-specific security plans to establish minimum safety and security guidelines for Authority-designated contractors of, and visitors to, construction projects. The Authority-designated contractor will 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, preventive 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 Authority-designated contractors and Authority-designated subcontractors. The Valley Fever Health and Safety designee will coordinate with the county Public Health Officer and oversee and manage the implementation of Valley Fever control measures. The Valley Fever Health and Safety designee is responsible for ensuring the implementation of measures in coordination with the county Public Health Officer. Medical information will be maintained following applicable and appropriate confidentiality protections. The Valley Fever Health and Safety designee in coordination with the county Public Health Officer will determine what measures will be added to the requirements for the Safety and Security Management Plan regarding preventive measures to avoid Valley Fever exposure. Measures will 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 filters; and (5) make National Institute for Occupational Safety and Health approved respiratory protection with particulate filters as recommended by the California Department of Public Health available to workers who request them.
- System safety program plans incorporate FRA requirements and are implemented on FRA approval. The FRA's Systems Safety Program Plan requirements will be determined in the FRA's new System Safety Regulation (49 CFR Part 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 CFR Parts 200-299.
- The HSR Urban Design Guidelines (Authority 2011b) require implementing the principles of crime prevention through environmental design. The Authority-designated contractor will consider four basic principles of crime prevention through environmental design during station design and site planning: territoriality (design physical elements that express ownership of the station or site); natural surveillance (arrange physical features to maximize visibility); improved sightlines (provide clear views of surrounding areas); and 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-designated contractor will establish fire/life safety and security committees throughout the project 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 will 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.
- 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 will maintain the safety of employees, passengers, and the public.

SS-IAMF#3: Hazard Analyses

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. Prior to project construction, the Authority or its contractor will prepare a hazard assessment includes a preliminary hazard analysis and threat and vulnerability assessment.

- The Authority's programmatic preliminary hazard analyses are developed in conformance with the FRA's *Collison Hazard Analysis Guide: Commuter and Intercity Passenger Service* (FRA 2007) and the U.S. Department of Defense's System Safety Program Plan (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed by—and either eliminated or minimized—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, 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 Authority-designated contractor will conduct site-specific preliminary hazard analysis and threat and vulnerability assessments to apply the programmatic work to their specific project designs.

The Authority's safety and security committees will be responsible for implementing the recommendations contained in the hazard analysis during HSR operation.

SS-IAMF#4: Oil and Gas Wells

Prior to ground-disturbing activities, the Authority-designated contractor shall identify and inspect all active and abandoned oil and gas wells within 200 feet of the HSR tracks. Any active wells will be abandoned and relocated by the Authority-designated contractor in accordance with the California Department of Conservation, Division of Oil, and Gas and Geothermal Resources 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 will be responsible for compensating the well owner for lost production. All abandoned wells within 200 feet of the HS tracks will be inspected and re-abandoned, as necessary, in accordance with California Department of Conservation, Division of Oil, and Gas and Geothermal Resources standards and in coordination with the well owner. The Authority-designated contractor will provide the Authority with documentation that the identification and inspection of the wells has occurred prior to construction.

SS-IAMF#5: Aviation Safety

To address FAA requirements related to its mandate of ensuring civil aviation safety and to prevent the potential for disruption of airfield and airspace operations at Fullerton Municipal Airport as a result of construction or operation of the project section, the Authority or the Authority-designated contractor(s) on behalf of the Authority will:

- Submit designs, information, or both to FAA as required by 14 CFR Part 77 to ensure design of permanent HSR features within and adjacent to the boundary of Fullerton Municipal Airport do not intrude into imaginary surfaces as defined in 14 CFR Part 77.9(b).
- Submit construction plans, information, or both to FAA as required by 14 CFR Part 77, which may include the location of planned HSR construction and construction staging areas within and adjacent to the boundary of the Fullerton Municipal Airport, the types and height of proposed equipment, and planned time/duration of construction, to ensure construction within and adjacent to the boundary of Fullerton Municipal Airport does not intrude into imaginary surfaces as defined in 14 CFR Part 77.9(b).
- Implement measures required by FAA to ensure continued safety of air navigation during HSR construction and operation, pursuant to 14 CFR Part 77.5(c).
- Ensure that the planned HSR facilities do not violate any grant assurances that are imposed at Fullerton Municipal Airport as a condition for obtaining an Airport Improvement Grants from FAA.
- If necessary, work with the City of Fullerton to amend the current Airport Layout Plan for any temporary or permanent construction-related facilities required for the HSR project to be submitted to the FAA for approval.

Socioeconomics and Communities

SOCIO-IAMF#1: Construction Management Plan

Prior to construction, the Authority-designated contractor will prepare a CMP providing measures that minimize construction impacts on communities, in particular low-income households and minority populations that are more sensitive to construction-borne disruptions. The plan will be submitted to the Authority for review and approval. The plan will include actions pertaining to communications, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on surrounding communities, particularly low-income households and minority populations. The plan will verify that property access is maintained for local businesses, residences, and emergency services. This plan will 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 will include efforts to consult with local transit providers to minimize effects on local and regional bus routes in affected communities.

SOCIO-IAMF#2: Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act

The Authority must comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended (Uniform Act). The provisions of the Uniform Act, a federally mandated program, will 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.

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 will receive federal funding, the Uniform Act takes precedence. Owners of private property have federal and state constitutional guarantees that their property will 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 will be negotiated on the date of valuation. The value must be agreed on 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).

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:

- *Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Residential)*
- *Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Mobile Home)*
- *Your Rights and Benefits as a Displaced Business, Farm, or Nonprofit Organization under the Uniform Relocation Assistance Program*

SOCIO-IAMF#3: Relocation Implementation Plan

Before any acquisitions occur, the Authority will develop a Relocation Implementation 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, the Relocation Implementation Plan will be written in a style that also enables it to be used as a public-information document.

The Relocation Implementation Plan will be designed to meet the following objectives:

- 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 resource study area to provide for all displaced persons and businesses to receive fair and consistent relocation benefits.
- 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.

The Relocation Implementation Plan will include the following components:

- 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 will also act to address concerns about the relocation process as it applies to the individual situations of property owners, tenants, and other residents.

Transportation

TR-IAMF#1: Protection of Public Roadways During Construction

Prior to construction, the Authority-designated contractor shall provide a photographic survey documenting the condition of the public roadways along truck routes providing access to the proposed project site. The photographic survey will be submitted for approval to the agency responsible for road maintenance and the Authority. The Authority-designated contractor will be 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 Authority-designated contractor will survey the condition of the public roadways along truck routes providing access to the proposed project site after construction is complete. The Authority-designated contractor will 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

The Authority-designated contractor shall prepare a detailed 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 or property owners having authority over the site. The Authority must review and approve the CTP before the Authority-designated contractor commences any construction activities. This plan will 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 will provide traffic controls pursuant to the *California Manual on Uniform Traffic Control Devices* sections on temporary traffic controls (Caltrans 2017) and will include a traffic control plan that includes, at a minimum, the following elements:

- 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 will be considered as an alternative to temporary closures where practicable and where it will result in better traffic flow than will 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 during construction, limit to the hours that are least disruptive to access for the adjacent land uses.
- Provisions for 24-hour access by emergency vehicles.
- Safe vehicular and pedestrian access to local businesses and residences during construction. The plan will provide for scheduled transit access where construction will otherwise impede such access. Where an existing bus stop is within the work zone, the Authority-designated contractor will 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 will 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 near homes, schools, daycare centers, and parks.
- Promotion of child safety within and near the resource study area. For example, crossing guards could be provided in areas where construction activities are near schools, daycare centers, and parks.

CTPs will consider and account for the potential for overlapping construction projects.

TR-IAMF#3: Off-Street Parking for Construction-Related Vehicles

The Authority-designated contractor will 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 Authority-designated 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 will be addressed in the CTP.

TR-IAMF#4: Maintenance of Pedestrian Access

The Authority-designated contractor will prepare specific CMPs, as part of the CTP, to address maintenance of pedestrian access during the construction period, to the extent feasible, in accordance with design, safety, and Americans with Disabilities Act requirements. Construction actions that limit pedestrian access will 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, the Authority-designated contractor will provide covered walkways and fencing.

TR-IAMF#5: Maintenance of Bicycle Access

The Authority-designated contractor will prepare specific CMPs to address maintenance of bicycle access during the construction period, to the extent feasible, in accordance with design, safety, and Americans with Disabilities Act requirements. Construction actions that limit bicycle access will 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.

TR-IAMF#6: Restriction on Construction Hours

The Authority-designated contractor will 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 Authority-designated contractor will 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 will be implemented will be determined as part of the CTP. Based on Authority review of the CTP, the restricted hours may be altered to accommodate local travel patterns.

TR-IAMF#7: Construction Truck Routes

The Authority-designated contractor will deliver all construction-related equipment and materials on the designated truck routes identified in the CTP and will prohibit heavy-construction vehicles from using alternative routes to get to the site. Truck routes will 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 will be addressed in the CTP.

TR-IAMF#8: Construction During Special Events

The Authority-designated contractor will 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 will be addressed in the CTP.

TR-IAMF#9: Protection of Freight and Passenger Rail During Construction

The Authority-designated contractor will 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 will be built to allow existing train lines to bypass any areas closed for construction activities. On completion, tracks will be opened and repaired, or new mainline track will be built, and the “shoofly” will be removed. Authority-designated contractor repair responsibility will be included in the contract.

TR-IAMF#11: Maintenance of Transit Access

The Authority-designated contractor will prepare specific CMPs, as part of the CTP, to address maintenance of transit access during the construction period, to the extent feasible, in accordance with design, safety, and Americans with Disabilities Act requirements. Construction actions that limit transit access will include, but not be 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.

TR-IAMF#12: Pedestrian and Bicycle Safety

Prior to construction, the Authority-designated contractor will provide a technical memorandum describing how, during operation, pedestrian and bicycle accessibility and safety will 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 will be carried out in a manner to encourage maximum potential access from nonmotorized modes. Local access programs, such as Safe Routes to Schools, will be maintained or enhanced. Access to community facilities for vulnerable populations will be maintained or enhanced.

TR-IAMF#13: Stakeholder Coordination with Transportation Agencies

As design of the project section progresses, the Authority will continue to coordinate with agencies that provide existing or planned rail services and bus services, or maintain operating

rights within the corridor, including BNSF Railway, Southern California Regional Rail Authority (Metrolink), Los Angeles – San Diego – San Luis Obispo Rail Corridor Agency, National Railroad Passenger Corporation (Amtrak), Orange County Transportation Authority, and Riverside County Transportation Commission. The purpose of this ongoing stakeholder coordination is to ensure that the design, construction, and operation of the project section does not negatively affect existing and planned rail service, including bus routes that service existing and planned rail stations. The Authority will work with the agencies to define roles and responsibilities within the shared corridor, including operational and maintenance responsibilities.

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