Broadway Bridge Feasibility Study Environmental Considerations

PREPARED FOR:	City of West Sacramento, in cooperation with the City of Sacramento
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Introduction

The purpose of this Environmental Considerations memorandum is to identify the critical environmental constraints and the level of impact analysis that will be required for alternative alignment options for construction of a new bridge across the Sacramento River between the City of West Sacramento and the City of Sacramento (Cities). This memorandum will be used to support the Broadway Bridge Feasibility Study being prepared for the project.

Study Area

The study area reviewed for the identification of constraints encompasses the bridge alignment locations and roadway approaches on the west and east side of the river for five bridge alignment alternatives (A, B, C1, C2, and D). Within this area are commercial and industrial properties; recreational resources such as a segment of the Sacramento River Parkway, Sacramento Marina, and Fredrick Miller Regional Park. The study area also includes the Sacramento Southern Railroad.

Approach to Analysis

Construction and operation of a new bridge across the Sacramento River is anticipated to result in impacts to biological and cultural resources, changes to recreational resources and the visual and aesthetic aspects of the river, introduction of a new source of noise and air emissions, and changes to the communities located at the connection points as a result of the bridge approach roadways.

To support the selection of an alignment, this memorandum addresses critical differences in constraints and analysis requirements of the alternatives for environmental resource areas, including recreational resources, community/land uses, noise and vibration, visual resources, biological resources, cultural resources, and air quality. Engineering, traffic, and transportation aspects of the project are discussed in separate documents, as are aspects related to hydrology and floodplains; water quality and storm water runoff; geology, soils, seismicity; and hazardous materials.

The analysis of impacts on environmental resources caused as a result of the proposed project will be separately documented in compliance with the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Summary of Conclusions

Special Environmental Considerations

Table 1 briefly compares environmental considerations by alternative, and identifies whether there is a difference between the effects of the alignments. In most cases, the alternatives have identical environmental considerations and there would be little difference in the level of impact between each of the alternatives.

Table 1. Environmental Considerations by Alternative

Resource Area	Alternative A	Alternative B	Alternative C1	Alternative C2	Alternative D	Conclusions
Recreation/Section 4(f)/ Section 6(f)	No direct effect on Fredrick Miller Regional Park Sacramento River Parkway trail Sacramento Southern Railroad Sacramento Marina Class II bicycle lanes Section 4(f) and Section 6(f) resources	No direct effect on Fredrick Miller Regional Park Sacramento River Parkway trail Sacramento Southern Railroad Sacramento Marina Class II bicycle lanes Section 4(f) and Section 6(f) resources	Possible minor effect on Fredrick Miller Regional Park Sacramento River Parkway trail Sacramento Southern Railroad Sacramento Marina Class II bicycle lanes Section 4(f) and Section 6(f) resources	Minor effect on Fredrick Miller Regional Park Sacramento River Parkway trail Sacramento Southern Railroad Sacramento Marina Class II bicycle lanes Section 4(f) and Section 6(f) resources	Greatest effect on Fredrick Miller Regional Park Sacramento River Parkway trail Sacramento Southern Railroad Sacramento Marina Class II bicycle lanes Section 4(f) and Section 6(f) resources	Alignment D would have the greatest effect on Fredrick Miller Regional Park due to location of alignment within park For other resources, no substantial difference between alternatives
Community/Land Use	Parcel acquisition of vacant property north of the Shell gasoline storage facility tank farm Parcel acquisition at intersection of 15th Street. and 5th Street Greater acquisition necessary from vacant lot north of Broadway Parcel acquisition to improve the Broadway approach Circulation changes, including new four-way intersection at 5th Street/15th Street	Parcel acquisition of vacant property north of the Shell gasoline storage facility tank farm Parcel acquisition at intersection of 15th Street. and 5th Street Some acquisition necessary from vacant lot north of Broadway Parcel acquisition and land use change of the Chevron facility Circulation changes, including new four-way intersection at 5th Street/15th Street	Parcel acquisition of vacant property north of the Shell gasoline storage facility tank farm Parcel acquisition at intersection of 15th Street and 5th Street Partial acquisition of the Phillips 66 vacant lot Parcel acquisition to improve the Broadway approach Circulation changes, including new four-way intersection at 5th Street/15th Street	Parcel acquisition of vacant property north of the Shell gasoline storage facility tank farm Parcel acquisition at intersection of 15th Street and 5th Street Partial acquisition of the Phillips 66 vacant lot Parcel acquisition of the Phillips 66 parcels south of Broadway Parcel acquisition to improve the Broadway approach Circulation changes, including new four-way intersection at 5th Street/15th Street	No parcel acquisition of north area necessary No acquisition at intersection Partial acquisition of vacant lot north of Broadway Parcel acquisition of a larger portion of the Phillips 66 river side parcel and change in land use with the removal of tanks Acquisition within Fredrick Miller Regional Park Parcel acquisition to improve the Broadway approach Circulation changes, including new T-intersection	Acquisitions and land use changes differ by alternative but primarily by location, not overall scale Overall, no substantial difference between alternatives with the exception of effects on park
Noise and Vibration	Furthest from Fredrick Miller Regional Park New source of operational noise Temporary construction noise	Approximately 425 feet closer to Fredrick Miller Regional Park than Alternative A New source of operational noise Temporary construction noise	Approximately 375 feet closer to Fredrick Miller Regional Park than Alternatives A or B New source of operational noise Temporary construction noise	Approximately 250 feet closer to Fredrick Miller Regional Park than Alternatives A, B, or C1 New source of operational noise Temporary construction noise	Within the northern limits of Fredrick Miller Regional Park New source of operational noise Temporary construction noise	Alignment D would have greatest effect on noise levels at Fredrick Miller Regional Park Impacts are driven by proximity, volume of traffic, and construction methodology.
Visual Resources	New structure, new roadway approaches, and new four-way intersection added to viewshed	New structure, new roadway approaches, and new four-way intersection added to viewshed	New structure, new roadway approaches and new T-intersection added to viewshed	New structure, changes to park entrance, new roadway approaches, and new T-intersection added to viewshed	New structure within park, changes to park entrance and park layout, new roadway approaches, and new T-intersection added to viewshed	No substantial difference between alternatives with the exception of changes to park views caused by Alignment D
Biological Resources	Effects on terrestrial special-status species and nesting habitat Effects on special-status fish Fill in waters of the U.S. Removal of heritage trees	Effects on terrestrial special-status species and nesting habitat Effects on special-status fish Fill in waters of the U.S. Removal of heritage trees	Effects on terrestrial special-status species and nesting habitat Effects on special-status fish Fill in waters of the U.S. Removal of heritage trees	Effects on terrestrial special-status species and nesting habitat Effects on special-status fish Fill in waters of the U.S. Removal of heritage trees	Effects on terrestrial special-status species and nesting habitat Effects on special-status fish Fill in waters of the U.S. Removal of heritage trees	No substantial difference between alternatives

Table 1. Environmental Considerations by Alternative

Resource Area	Alternative A	Alternative B	Alternative C1	Alternative C2	Alternative D	Conclusions
Cultural Resources	Archaeological site locations are confidential; study area is sensitive for archaeological resources Crosses historic levees Effects on CA-Sac-505-H	Archaeological site locations are confidential; study area is sensitive for archaeological resources Crosses historic levees Effects on CA-Sac-505-H	Archaeological site locations are confidential; study area is sensitive for archaeological resources Crosses historic levees Effects on CA-Sac-505-H	Archaeological site locations are confidential; study area is sensitive for archaeological resources Crosses historic levees Effects on CA-Sac-505-H	Archaeological site locations are confidential; study area is sensitive for archaeological resources Crosses historic levees Effects on CA-Sac-505-H	No substantial difference between alternatives Entire study area is potentially sensitive for archaeological resources
Air Quality	New source of operational air quality emissions Temporary construction emissions	New source of operational air quality emissions Temporary construction emissions	New source of operational air quality emissions Temporary construction emissions	New source of operational air quality emissions Temporary construction emissions	New source of operational air quality emissions Temporary construction emissions closest to the park	No substantial operational difference between alternatives Impacts are driven by proximity, volume of traffic and construction methodology

Anticipated Environmental Documentation Requirements

Technical Studies. Because they are similarly located to each other, each of the alternatives will require the same level of environmental analysis. The following technical studies will be necessary to document the effects of the project alternatives for the topics addressed in in this memorandum:

- Section 4(f)/6(f) Evaluation
- Community Impact Assessment
- Noise Study Report
- Visual Impact Assessment
- Natural Environment Study
- Biological Assessment
- Historical Resources Evaluation Report
- Archaeological Survey Report
- Historic Properties Survey Report
- Air Quality Study Report
- Air Quality Conformity Report

Environmental Document. The project could result in significant impacts, and there is a potential that some significant impacts could not be reduced to less-than-significant levels with the implementation of mitigation. Because of this, the anticipated environmental document needed for CEQA compliance is an Environmental Impact Report (EIR). The City of West Sacramento would be the CEQA lead agency.

Based on the project's potential for impacts as defined by the NEPA, and considering both the context and intensity of the impacts, an Environmental Assessment with Finding of No Significant Impact (EA/FONSI) is the anticipated environmental document for NEPA compliance. Caltrans would be the NEPA lead agency, as assigned by the Federal Highway Administration (FHWA).

Permits and Approvals

Table 2 provides the permits and approvals that are anticipated for the project.

Table 2. Permits and Approvals Needed

Agency	Permit/Approval
U.S. Coast Guard (USCG)	Authorization under General Bridge Act of 1946, as amended, for new bridge over navigable waters of the United States
U.S. Army Corps of Engineers (USACE)	Section 404 Clean Water Act authorization for fill of waters of the United States
U.S. Army Corps of Engineers (USACE)	Section 408 authorization for encroachment/alteration of existing levees
National Marine Fisheries Service (NMFS)	Coordination regarding threatened and endangered species
U.S. Fish and Wildlife Service (USFWS)	Coordination regarding threatened and endangered species
California Department of Fish and Wildlife (CDFW)	Section 1602 Department of Fish and Game Code Streambed Alteration Agreement
Central Valley Regional Water Quality Control Board (CVRWQCB)	Section 401 Water Quality Certification and coverage under the existing Caltrans National Pollutant Discharge Elimination System Permit (Order No. 00-06-DWQ)
Central Valley Flood Protection Board (CVFPB)	Encroachment Permit
State Lands Commission (SLC)	Lease of State Lands
West Sacramento Area Flood Control Agency (WSAFCA)	Approval of changes to levee
Sacramento Area Flood Control Agency (SAFCA)	Approval of changes to levee
Yolo-Solano Air Quality Management District (Yolo-Solano AQMD)	Formal notification prior to construction
Sacramento Metropolitan Air Quality Management District (SMAQMD)	Formal notification prior to construction

Effects on Cost and/or Schedule

As shown in Table 2, the project is located in a complex regulatory environment. Beyond the cost and schedule to properly identify and document the effects of the project and obtain regulatory authorization, the environmental-related component of the project discussed in this memorandum that will have the most effect on schedule (and cost) will be the ability to negotiate a bridge construction sequence with NMFS and USFWS, as well as flood control agencies, that allows for in-water construction, including pile driving, to occur in a reasonable manner. The standard allowable in-water work windows will likely not provide an adequate time period each construction season. Lessons learned from the outcome of the regulatory discussions occurring for the C Street/I Street Bridge upstream will need to be applied; however, the bridge design specific to the Broadway location will have unique aspects in terms of number of piles driven and overall duration of construction.

There is typically a gap in time between approval of the environmental document and construction of the project. Within that gap, remaining funding, final engineering design, right-of-way acquisition, and permit approval processes all occur. Large delays in any of these processes, due to the timing of funding or duration of on-the-ground efforts such as site remediation, and changes to the project or to the existing conditions in the project area could result in a discrepancy between current conditions and potential project impacts and the impacts identified in the environmental document and mitigation adopted for the project.

Supplemental environmental documentation may be needed if there are substantial changes to the project or if there are new or more severe significant impacts that were not covered by the original environmental document. The supplemental documentation could be necessary for both CEQA and NEPA and depending on the changes, may require public circulation and review. At each major approval step in the project, the environmental document will be reevaluated to determine whether it is still valid. If it is not, preparation of supplemental environmental documentation would have an effect on project cost and schedule.

Environmental Resource Discussion

Following is a brief discussion of resources within the study area under the following topic areas: recreational resources, community/land uses, noise and vibration, visual resources, biological resources, cultural resources, and air quality.

Recreational Resources/Section 4(f)/Section 6(f)

The study area includes a Class II bicycle lane on 5th Street north of 15th Street in West Sacramento (a Class II bicycle lane is proposed on 5th Street south of 15th Street) and on Broadway in Sacramento, the Sacramento River, walking and bicycle trail in the Sacramento River Parkway, Fredrick Miller Regional Park, and Sacramento Marina. The study area also includes the Sacramento Southern Railroad with trains operated on weekends by the California State Railroad Museum Excursion Railroad.

Several regulations related to recreational resources apply to the project. A summary of how they relate to the study area is included below.

- **2013 West Sacramento Bicycle, Pedestrian, and Trails Master Plan.** The West Sacramento Bicycle, Pedestrian, and Trails Master Plan (City of West Sacramento, 2013) identifies a vision of connected bikeways, walkways, and trails within the City, including a continuous Class II bicycle lane on 5th Street. The new bridge approach connection point at 5th Street at or near 15th Street would need to consider connections for people walking or on bicycles.
- **Sacramento River Parkway Plan.** The Sacramento River Parkway Plan (City of Sacramento, 1997) is the management plan for the Sacramento River Parkway and includes guidelines for the recreational

use of the parkway. The goals and policies listed in the plan guide the implementation of the plan. The Parkway and the bicycle/pedestrian trail in it would be crossed by the bridge alignments.

- **Section 4(f) of the Department of Transportation Act of 1966.** Since federal funding from the Department of Transportation is being used, it triggers compliance with Section 4(f) of the Department of Transportation Act. The act prohibits the use of publicly owned parks, recreation areas, cultural resources, and wildlife or waterfowl refuges for federally funded projects unless it can be shown that there was no alternative to the use of the land and that the use was designed to minimize harm to the resource protected under Section 4(f). Public recreational resources and cultural resources within the study area are protected under Section 4(f).

  There are three possible ways in which a project could "use" a resource when:

  1. Land is permanently incorporated into a transportation facility;
  2. There is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or
  3. There is a constructive use of land.

  Constructive use occurs when the project does not directly incorporate land from a Section 4(f) resource, but the project's impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished. Examples of way the resource could be substantially impaired are through visual changes or changes in noise levels.

- **Section 6(f) of the Land and Water Conservation Act of 1965.** In the Sacramento River Parkway the bicycle/pedestrian trail received grants from the Land and Water Conservation Fund. And bicycle improvements at Miller Park Circle and Front Street, as part of the Core City Bikeway Development project, also received a grant from the fund (California Department of Parks and Recreation, 2013). The Land and Water Conservation Act requires that the conversion of any property that has used investments from this fund to a non-recreational use must be replaced by property of equal value and usefulness. The bridge alignments cross the trail in the Sacramento River Parkway and would affect the trail in similar ways. It has not yet been determined if an actual conversion of property to a nonrecreational use would occur.

Technical Analysis Requirements. A Section 4(f)/6(f) evaluation report will be required to document the project's effects on resources protected by the provisions of both the Department of Transportation Act (Section 4[f]), and the Land and Water Conservation Act (Section 6[f]). Concurrence from the owners of the resources regarding the effects of the project will be necessary.

Comparison of Alternatives. Recreational uses in Sacramento would be impacted under all alignment alternatives. The Sacramento River Parkway trail would be realigned in order to connect to the bridge, enabling cross-river access, as well as to provide through traffic for bicycles and pedestrians. The Sacramento Southern Railroad would stay at-grade and in its current location regardless of alternative.

For three of the alignment alternatives (C1, C2, and D), roadway modifications to raise the elevation of the approach roadway in Sacramento would affect the entrance to Fredrick Miller Regional Park at Marina View Drive near its connection to Miller Park Circle. Alignments A and B would avoid the park parcel completely. It is possible that Alignment C1 could be designed to avoid the park as well.

Alignment D would have the greatest effect on the Fredrick Miller Regional Park because it is aligned the furthest to the south through areas currently used for recreational activities within the park. Alignment C2 would have less of an effect on park property, primarily affecting the entrance to the park

because of the change in elevation needed on Marina View Drive to connect to the new elevation of Broadway. Alignment C1 may result in a minor effect on the park entrance.

A determination of whether or not one or more of the alternatives would "use" a Section 4(f) resource would need to be made. Based on its current location, Alignment D would result in a "use" of the recreational features in the park. Section 4(f) requires selection of an alignment alternative that would result in the least overall harm to a Section 4(f) property, after considering and balancing a number of factors related to the effect and the project.

During construction of the project with any of the alignment alternatives, Front Street or Marina View Circle would remain open at all times to provide access to the Sacramento Marina and Fredrick Miller Regional Park. Construction of any of the alignments would have a temporary effect on access to other recreational resources while detours and construction safety provisions are in place.

Community/Land Uses/Environmental Justice

Land uses in the study area include park, recreational, industrial, commercial, transportation, and riverine (Sacramento River). The project would require acquisitions of land from adjacent parcels, which would displace existing uses. The project would also change community connections and have the potential to induce growth by adding a new transportation facility between the Cities.

Pioneer Bluff Transition Plan. The study area in West Sacramento is part of the Pioneer Bluff Transition Plan. This plan details the process for transitioning land uses in the area from industrial to urban waterfront uses including parks and recreational bicycle/pedestrian trails (City of West Sacramento, 2014). As part of this transition, tanks farms, including those with the study area, corporation yards, and fueling stations would be relocated. Demolition and remediation is anticipated to begin in 2020 (City of West Sacramento, 2014:20). Regional transportation projects, including construction of the Broadway Bridge, provide additional impetus to development of the riverfront.

Land Uses in West Sacramento. Existing land uses in the study area in West Sacramento include a Shell gasoline storage facility and Buckeye Terminals facility (tank farms), Shell fueling station, and corporation yard located on 5th Street. An office park, pest control company, and a vacant commercial building are located on 15th Street. Commercial and industrial uses located in West Sacramento along 5th Street and 15th Street would be affected by construction of the new bridge approach and roadway widening. Parcel acquisitions would occur along 5th Street for all alternatives and along 15th Street under Alignments A and B. There are no residential land uses within the study area.

Land Uses in Sacramento. Recreational land uses in the study area are discussed above, under Recreational Resources. Industrial and commercial land uses in the study area include the Chevron gasoline storage operations facility, Phillips 66 gasoline storage facility on Broadway, and Setzer Forest Products on Broadway. With Alignment A, parcel acquisition of the Chevron facility would be required as well as a change in land use with the removal of tanks and other facilities. With Alignment B, parcel acquisition may be required, but not directly result in a change in land use. Slivers of parcel acquisition would be required from the Phillips 66 gasoline storage facility on Broadway and Setzer Forest Products facilities. There are no residential land uses within the study area.

Alternative Alignments C1 and C2 would require some parcel acquisition from parcels owned by Phillips 66 adjacent to the river and along the south side of Broadway.

For Alignment D, parcel acquisition of a larger portion of the Phillips 66 river side parcel would be required as well as a change in land use with the removal of tanks. The roadway approach for Alternative D would also traverse through Fredrick Miller Regional Park.

Major changes in access and circulation would occur with a new connection across the Sacramento River. Construction of the bridge approach would cause temporary delays and changes in access along

5th Street and 15th Street in West Sacramento. Changes in traffic patterns would also affect Jefferson Boulevard.

Construction of the bridge approach would cause temporary delays and changes in traffic and pedestrian and bicycle access along Broadway, Miller Park Circle, and Marina View Drive in Sacramento. Changes in traffic patterns would also affect the Front Street/Broadway intersection.

Technical Analysis Requirements. A Community Impact Assessment (CIA) will be required and will address potential effects of the project on recreation effects, growth inducement, community character and cohesion, community facilities and services, environmental justice, and transportation facilities. The CIA will assess the project's consistency with the Cities' general plans as well as other applicable planning documents. The CIA will be prepared consistent with Caltrans' guidelines.

Comparison of Alternatives. The major differences between the alternatives is in the location of land acquisition and modification. These differences are discussed further in the sections below. Each alternative would require the same coordination with the remediation plans at the West Sacramento waterfront area and as a result of land use effects in Sacramento. The Broadway Bridge project is a key component of the reshaping of the Pioneer Bluff area in West Sacramento.

The changes in circulation and traffic patterns would affect communities on both sides of the river with no difference between the alternatives. Similarly, the potential for the project to affect minority and/or low-income populations disproportionately is equal for all alternatives.

***West Sacramento*.** The Shell gasoline storage facility tank farm in West Sacramento would be affected by construction of the new approach roadway and changes to roadway design under Alignments A, B, and C. Alignment C would require removal of more tanks and structures than the other alignments. Alignment D would require parcel acquisition and possible tank removal from the Buckeye Terminals parcel. However, assuming the tank farms are relocated per the Pioneer Bluff Transition Plan and remediation of the parcels is complete by the time bridge construction commences, the tank farm parcels will be vacant and the project would not conflict with future land uses under any alternative.

Alignments A and B would require a parcel acquisition on the vacant property just north of the Shell gasoline storage facility tank farm. Alignments C and D would not encroach on this parcel.

The bridge approach and road widening under Alignments A and B would impact businesses at the intersection of 15th Street and 5th Street with Alignment B requiring the greatest right of way acquisitions. Because of the curve in the roadway approach to the bridge in West Sacramento, Alignment B would have more of an effect on the property at the 15th Street and 5th Street intersection.

Under Alignments A and B, the bridge approach would be constructed on 15th Street to flow on to Jefferson Boulevard. As a result, increased traffic could occur at the intersection of Jefferson Boulevard and 15th Street. Under Alignments C and D, increased traffic flow would occur primarily along 5th Street.

A larger portion of parcel acquisition along 5th Street would occur under Alignments C and D, as road widening would impacting the Shell gasoline station and another business. Widening along 15th Street would encroach upon businesses under Alignments A and B, equally, but not at all under Alignments C and D.

***Sacramento*.** As discussed above under Recreational Resources, Alignment D would have the greatest effect on Fredrick Miller Regional Park as it is aligned furthest to the south within the park and would require acquisition of a portion of the park. Similar, temporary detours and trail closures would occur under all alternatives in Sacramento.

Encroachment on the vacant lot north of Broadway and adjacent to the river is greatest under Alignments A and B and minor for Alignment C1.

Encroachment on industrial land uses in Sacramento would occur under all alternatives. The greatest amount of parcel acquisition of the Chevron facility site north of Broadway would be under Alignment A which would require tank removal in addition to parcel acquisition. Slivers of parcel acquisition from the Phillips 66 gasoline storage facility and Setzer Forest Products facilities south of Broadway would be essentially equal under all alternatives, with the exception of Alignment D, which would require tank removal in addition to acquisitions from the Phillips 66 parcel.

Noise and Vibration

Noise-sensitive land uses are primarily considered to be those areas where people reside. Recreational areas where quiet is an important part of the environment can also be considered sensitive to noise. Some commercial areas may be considered noise sensitive as well such as the outdoor restaurant seating areas. Schools are also sensitive to noise.

In the vicinity of the study area, residential areas and a health care facility are located in West Sacramento west of Jefferson Boulevard. Recreational areas along the Sacramento River, including the river itself, Sacramento River Parkway and Fredrick Miller Regional Park, are affected by traffic noise from the Pioneer Bridge. Other adjacent lands uses are not considered sensitive to noise, such as the Pioneer Bluff area.

Operation of heavy equipment associated with construction of a bridge would generate noise that could affect nearby noise sensitive land uses. The amount of construction noise generated would generally be independent of bridge alignment. Construction noise will be subject to the Cities' noise ordinances. Construction noise decreases at a rate of about 6 dB for every doubling of distance from the source.

The FHWA noise regulations require noise analyses for all Type I projects, defined as projects that involve construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. The proposed project is a Type I project. The level of operational noise (e.g., traffic noise) would be independent of bridge alignment but would vary by the forecasted volume of traffic and number of travel lanes constructed.

Technical Analysis Requirements. A Noise Study Report pursuant to FHWA, Title 23, Section 772 of the Code of Federal Regulations (CFR) (23 CFR 772) and the Caltrans Traffic Noise Analysis Protocol will be required. The report will address both operational noise levels and construction noise impacts.

If it is confirmed that impact pile driving is required for bridge construction, an assessment of underwater sound levels based on proposed pile installation materials and methods will be necessary. If it is found that sound levels exceed peak or cumulative interim thresholds currently used by NMFS, noise attenuation methods will need to be evaluated. Effects of pile driving are discussed further under Biological Resources.

Comparison of Alternatives. In addition to the overall introduction of a new source of traffic noise, changes in noise levels at noise sensitive land uses would be related to the proximity of the alignment to the land use. The bridge alignment for Alignments C1 and C2 are located approximately 350 and 475 feet, respectively, south of Alignment A (the northern most of the alternatives). The Broadway roadway approach alignment for Alignment C2 is nearly identical to the existing Broadway alignment, which is also close to the park. Though the differences in distance are small (approximately 250 feet between Alignment C2 and D), because Alignment D is within Fredrick Miller Regional Park it is expected to have a greater effect on permanent changes in noise levels in the park.

Construction activities closer to noise-sensitive land uses would result in greater effects though, as above for operational effects, due to the overall proximity of the alignments to each other the differences in construction effects would be small. Therefore, there is no substantial difference between

Alignments A, B, C1, and C2 as they relate to noise. Alignment D would result in the greatest effect caused by construction noise levels because of its location within Fredrick Miller Regional Park.

Visual Resources

The study area is comprised of a mix of industrial, commercial, park, transportation, and riverine land uses. Viewer groups include land- and water-based recreationists, tourists, businesses, and roadway users. There are no residential areas that would be directly affected by the proposed project and its alternatives. Viewer sensitivity is a function of the visibility of resources in the landscape, proximity of viewers to the visual resource, elevation of viewers relative to the visual resource, frequency and duration of views, number of viewers, and type and expectations of individuals and viewer groups.

There are no officially designated scenic routes in or near the study area. Roadways and recreational land uses in the study area provide views out and over the river corridor. Ground-level northern views are not vivid or highly unified because the area is transected by a large transportation facility (Pioneer Bridge) and land uses are disjunctive and have abrupt changes from one to the other, lacking gradual visual transitions. Views to the south are moderately vivid because of the increased consistency of views along the waterfront of Fredrick Miller Regional Park and the opposite shoreline with water-side vegetation in front of industrial land uses. Roadway users on the eastbound side of Pioneer Bridge have views of the river corridor as well as the industrial land uses adjacent to it. The new bridge would be in view for eastbound travelers in the right-most travel lane, but only briefly.

The study area looking south of Broadway is considered to have scenic views, but those views would not be affected by the project. Views to the north are less scenic and would change with introduction of a second bridge to the viewshed. Other visual changes resulting from the project would be changes to the existing visual character and light and glare.

Technical Analysis Requirements. A moderate Visual Impact Assessment (VIA) will be necessary, based on the Caltrans Questionnaire to determine VIA level. It is also anticipated that simulations of before and after views from key points in the project vicinity will be necessary.

Comparison of Alternatives. Each alternative alignment would result in the same/very similar visual impacts and at a very similar scale/degree of change, in terms of amounts of vegetation removed along the river and construction of a similar new bridge structure across the river. In West Sacramento, visual differences in the 15th Street/5th Street intersection in Alignments A and B and the T-connection at 5th Street in Alignments C1/2 and D would be minor as the area is highly developed and roadway users would have low sensitivity to the differences.

In Sacramento, the alternative alignments are in close enough proximity to one another that they would affect the same viewer groups. The primary difference among them is that the bridge would be slightly closer to or farther away from land-based recreational viewer groups but in most cases not so different that they would affect one viewer group or another at any location to a higher degree, with the exception of Alignment D. Alignment D would more substantially change the views within and from Fredrick Miller Regional Park as well as views of the park from the river.

Biological Resources

Sources reviewed for the evaluation of sensitive biological resources in the study area include the CDFW, California Natural Diversity Database (CNDDB), USFWS species list for the Sacramento West U.S. Geological Survey topographic quadrangle, and ICF file data. The study area includes developed areas (commercial, industrial, and recreational) and areas of natural habitat. The natural habitats in the study area include cottonwood riparian woodland, ruderal, and riverine (the Sacramento River). Some of these natural habitats are sensitive natural communities (e.g., riparian and riverine) that also provide habitat for several special-status species. In addition, riparian and large trees in the study area are protected

under local ordinances. The following sections describe the sensitive biological resources known to occur or with potential to occur in the study area.

Sensitive Natural Communities and Waters of the U.S.

Cottonwood Riparian Woodland. Cottonwood riparian woodland, a sensitive natural community, occurs along both banks of the Sacramento River in the study area, although the vegetation is sparser on the east river bank. Riparian woodland is a sensitive natural community that provides important habitat for wildlife and shaded riverine habitat for fish. Impacts on riparian habitat are usually regulated by the CDFW under Section 1602 of the California Fish and Game Code, which requires a streambed alteration agreement with CDFW for removal of riparian habitat and mitigation for the loss. The riparian habitat could also be used by the state-threatened Swainson's hawk, as well as other sensitive and migratory bird species, for nesting. All alignments would affect riparian habitat to a similar degree.

Riverine (Sacramento River). The Sacramento River is a water of the U.S., regulated by USACE, Regional Water Quality Control Board (RWQCB), and CDFW. Most of the riverbank in the study area is covered by riprap for erosion control. The portion of the river below the high tide line is regulated by the USACE and RWQCB, and the river bed and bank are regulated by the CDFW. In addition, the SLC has jurisdiction over the river bed. Placement of fill material, such as bridge pilings or riprap, within the high tide line of the river would require a Clean Water Act (CWA) Section 404 nationwide permit from USACE, CWA Section 401 permit from the RWQCB, Rivers and Harbors Act Section 10 permit, streambed alteration agreement from the CDFW, land lease amendment or permit from SLC, and mitigation for the loss of waters of the U.S. In addition, a State Reclamation Board permit and USCG bridge permit could be required. All alignments would affect the Sacramento River to a similar degree.

Special-Status Species and Heritage Trees. Based on a search of the CNDDB (California Department of Fish and Wildlife, 2015), the California Native Plant Society (CNPS) Inventory of Rare and Endangered Species (2015) and the USFWS species list (USFWS, 2015), several special-status species are known to, or have a potential to, occur within the study area. Some of these species are especially sensitive to disturbance and/or subject to more regulatory scrutiny due to their rarity and thus are considered to be a constraint to any project that would result in impacts to these species.

Table 3 lists those species considered to be biological constraints to constructing a crossing over the Sacramento River because of their sensitivity and/or because they are known to occur in the study area.

No special-status plant species are included in Table 3 because the potential is low for suitable habitat to support species-status plants in the study area. Special-status plants documented within approximately 5 miles of the study area occur primarily in vernal pool, marsh, riparian scrub, annual grassland, or tidal flat habitats. Of these habitat types, the study area might support riparian scrub, annual grassland, or tidal flat habitat, but no vernal pools or marsh. Additionally, due to the level of disturbance and recreational use of the river and riparian habitats in the study area, there is low potential for special-status plants to be present. However, the absence of special-status plants could only be confirmed by conducting blooming-period surveys in spring and summer.

Additional special-status species not identified in Table 3 may be encountered during project-level surveys.

Table 3. Special-Status Fish and Wildlife Species Known or with Greatest Potential to Occur in the Study Area

Species	Listing Status	Occurrence in Study Area
Chinook salmon species *Oncorhynchus tshawytscha*		
Sacramento River winter-run	Federally Endangered	Known to occur in the Sacramento River
Central Valley spring-run	Federally Threatened	Known to occur in the Sacramento River
Central Valley fall-run and late fall–run	California Species of Concern	Known to occur in the Sacramento River
Steelhead *Oncorhynchus mykiss*	Federally Threatened	Known to occur in the Sacramento River
Delta smelt *Hypomesus transpacificus*	Federally Threatened, California Endangered	Occurs primarily in the Delta and lower reaches of the Sacramento River and has historically been found as far upstream as Sacramento
Green sturgeon (Southern Distinct Population Segment [DPS]) *Acipenser medirostris*	Federally Threatened	Known to occur in the Sacramento River
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	Federally Threatened	Potential suitable habitat (riparian) in the study area
Swainson's hawk *Buteo swainsoni*	California Threatened	Nesting habitat in riparian along both sides of river and in some developed areas with suitable nest trees Nest occurrences to the north and south of the study area (California Department of Fish and Wildlife, 2014)
Bat species	Several Species of Special Concern	Several trees in the study area could be used for roosts

Special-Status Fish Species. The Sacramento River, including riparian habitat along the bank, has been identified as critical habitat for Central Valley spring-run Chinook salmon (70 FR 52600 September 2, 2005) and winter-run Chinook salmon (58 FR 33212 September 16, 1993). "Critical Habitat" is formal designation of an area as crucial to the survival of a species and essential for its conservation. In the federal Endangered Species Act (ESA) Section 3, Critical Habitat is defined as the following.

> "…the specific area within the geographic area occupied by a species, at the time it is listed in accordance with ESA, on which are found those biological features essential to the conservation of the species, and that may require special management considerations or protection; and specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species."

Chinook Salmon. Chinook salmon are anadromous fish, meaning that adults live in marine environments and return to their natal freshwater streams to spawn. Chinook salmon are anadromous fish, meaning that adults live in marine environments and return to their natal freshwater streams to spawn. Juveniles rear in freshwater for a period of up to 1 year until smoltification (i.e., a physiological preparation for survival in marine environs) and subsequent ocean residence. Only fall-run Chinook salmon occur in the American River system; however, winter-run, spring-run, and late fall–run could also occur due to its close connection with the Sacramento River. The runs are named after the season of adult migration, with each run having a distinct combination of adult migration, spawning, juvenile residency, and smolt

migration periods. In general, fall-run and late fall–run Chinook salmon spawn soon after entering their natal streams, while spring- and winter-run Chinook salmon typically hold in their natal streams for up to several months before spawning. The Sacramento River is designated critical habitat for spring-run Chinook salmon, winter-run Chinook salmon, and Central Valley steelhead.

- **Winter-Run.** Both the ESA and California Endangered Species Act (CESA) list the winter-run Chinook salmon evolutionary significant units (ESU) as an endangered species. Adult winter-run Chinook salmon immigration (upstream migration) through the Delta and into the Sacramento River occurs from December through July, with peak immigration from January through April. The peak period of juvenile emigration (downstream migration) through the lower Sacramento River into the Delta generally occurs between January and April (see Table 3).
- **Spring-Run.** The Central Valley spring-run Chinook salmon ESU, which includes populations spawning in the Sacramento River and its tributaries, is listed as threatened under ESA and CESA. Critical habitat is designated for spring-run Chinook salmon in the American River. The only streams in the Central Valley with remaining wild spring-run Chinook salmon populations are the Sacramento River and its tributaries. Spring-run Chinook salmon enter the Sacramento River from late March through September, but peak abundance of immigrating adults in the Delta and lower Sacramento River occurs from April through June. The timing of juvenile emigration from the spawning and rearing reaches can vary depending on tributary of origin and can occur from November through June.
- **Fall-Run and Late Fall-Run.** The Central Valley fall-run and late fall–run Chinook salmon ESUs are federal species of concern. Adult immigration of fall–run Chinook salmon into the American River is generally from mid-September through January. The majority of migration occurs from mid-October through December (Williams, 2001). Juveniles emigrate through the lower Sacramento River primarily from October through April.

Steelhead. Central Valley steelhead is listed as threatened under the ESA, and critical habitat is designated for steelhead in the American River. Steelhead, an anadromous variant of rainbow trout, is closely related to Pacific salmon. Immigration of adult steelhead into the Sacramento River occurs from September to April. Juveniles rear in fresh water from 1 to 4 years (usually 2 years), then migrate to the ocean as smolts in the spring (December through June).

Green Sturgeon. NMFS has divided sturgeon into two DPSs, including the southern and northern DPS. The northern DPS comprises sturgeon from the Eel River northward; the southern DPS comprises populations below the Eel, specifically the Sacramento River population. The southern DPS, which could occur in the study area, is federally listed as threatened. Spawning populations have been identified in the Sacramento River. The preferred spawning substrate is thought to be large cobble, although the substrate type may range from clean sand to bedrock.

Delta Smelt. Delta smelt are listed as threatened under the ESA and endangered under CESA. Critical habitat is designated from the Delta into the Sacramento River. Adult delta smelt begin spawning migration into the upper Delta in December or January. Spawning occurs between January and July, with peak spawning during April through mid-May. Spawning occurs along the channel edges in the upper Delta, including the Sacramento River above Rio Vista, Cache Slough, Lindsey Slough, and Barker Slough. Mitigation strategies for effects on Delta smelt would need to be developed in consultation with USFWS under the federal ESA and could include establishing avoidance buffers or placing seasonal restrictions on when work can occur.

The peak period of fish migrations through the lower Sacramento River is shown in **Table 4**.

Table 4. Life Stage Timing and Distribution of Key Fish Species in the Study Area

Species/Life Stage	Distribution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Winter-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to upper Sacramento River												
Juvenile rearing (natal stream)	Upper Sacramento River to San Francisco Bay												
Juvenile movement/rearing	Upper Sacramento River to San Francisco Bay												
Spring-Run Chinook Salmon													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries												
Juvenile movement	Upper Sacramento River and tributaries to San Francisco Bay												
Late Fall–Run Chinook Salmon													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries												
Juvenile movement/rearing	Upper Sacramento River and tributaries												
Fall-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to American River and tributaries												
Juvenile movement	Upper Sacramento River and tributaries to San Francisco Bay												
Steelhead													
Adult migration	San Francisco Bay to American River/ Sacramento River and tributaries												
Juvenile and smolt movement	Upper Sacramento River and tributaries to San Francisco Bay												
Green Sturgeon													
Adult migration and holding	San Francisco Bay to upper Sacramento River												
Juvenile rearing (natal stream to estuary)	Upper Sacramento River to San Francisco Bay												
Juvenile movement/rearing	Upper Sacramento River to San Francisco Bay												
Delta Smelt													
Adult migration	South Delta to north Delta and lower Sacramento River												
Spawning	Upper Delta to lower Sacramento River												

Potential project effects on listed species and critical habitat include both short- and long-term effects. Short-term effects include temporary construction-related impacts on fish and aquatic habitat that may last from a few hours to days (e.g., suspended sediment and turbidity, construction noise, artificial lighting). Long-term effects (addition of overwater structure, loss of aquatic habitat [substrate and water column], loss of SRA cover habitat) typically would last months or years, or would be permanent. These effects are generally due to physical alteration of important habitat attributes of the channel, shoreline, and adjacent bank. Short-term effects on listed fish species were evaluated qualitatively based on general knowledge of the impact mechanisms and species responses to construction actions. Long-term effects are measured in terms of the approximate area and/or linear feet of artificial shade, aquatic habitat, and SRA cover habitat affected by the proposed project.

Impact pile driving is of particular concern because of the intensity of sounds and known occurrences of fish kills associated with impact pile driving (Popper and Hastings, 2009). The effects of pile driving noise on fish may include behavioral responses, physiological stress, temporary and permanent hearing loss, tissue damage (auditory and non-auditory), and direct mortality (Popper and Hastings, 2009). In general, factors that may influence the magnitude of effects include species, life stage, and size of fish; type and size of pile and hammer; frequency and duration of pile driving; site characteristics (e.g., water depth); and distance of fish from the source of the underwater sound.

Special-Status Wildlife Species. The riparian habitat along the Sacramento River provides important habitat for wildlife, including several special-status species. The riparian habitat within the study area generally consists of a thin strip of shrubs and trees on both banks of the river. Though not high quality riparian habitat, it still provides wildlife habitat due to the size and structure of the trees.

Special-status wildlife species that would create the greatest constraints for constructing a new bridge across the Sacramento River in the study area include valley elderberry longhorn beetle, Swainson's hawk, and special-status bats. A brief discussion of these species is provided below.

Additional special-status wildlife species that could occur in the study area would include western pond turtle, white-tailed kite, yellow-breasted chat, and yellow warbler. If these species are identified within or adjacent to a proposed crossing site they could result in additional constraints to project construction.

Valley Elderberry Longhorn Beetle. The CNDDB (2015) has a historic record of VELB to the north of the study area along the Sacramento River near the I-80/I-5 interchange. No elderberry shrubs were observed during reconnaissance level surveys; however, elderberry shrubs could occupy the site prior to construction activities.

Removal of any elderberry shrubs in the study area would require mitigation. Shrubs can be indirectly impacted (e.g., change in hydrology) when construction occurs within 100 feet.

Swainson's Hawk. Swainson's hawks are known to nest north and south of the study area with the nearest approximately 0.1 mile north of the study area along the Sacramento River (CDFW, 2015). Large trees located in and adjacent to the study area provide suitable nesting habitat.

Pile driving and the use of cranes in proximity to an active nest are expected to exceed the existing levels of noise disturbance to which the birds are generally accustomed. These loud noises could startle Swainson's hawk beyond the study area and disrupt normal behaviors, including nesting. CDFW typically considers intensive new disturbances in developed areas to have potential impacts on active Swainson's hawk nests located in urban areas that are within 0.25 mile of the activity (California Department of Fish and Game 1994:10).

Special-Status Bats. Special-status bat species that could occur within the study area include pallid bat and western red bat (trees). These species are California species of special concern.

Other Nesting Birds and Raptors. Because the Sacramento River within the study area supports riparian woodland habitat it provides nesting habitat for a variety of birds, most of which are protected while nesting under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code.

Heritage Trees. Trees within the riparian habitat and other individual trees within the study area may qualify as heritage trees under the Cities' tree ordinances. Under the City of West Sacramento tree ordinance, heritage trees include all tree species with a circumference of 75 inches or more (diameter of 24 inches) and native oaks with a circumference of 50 inches or more (diameter of 16 inches). Removal of heritage trees is regulated by the City of West Sacramento and requires replacement plantings at the equivalent of 1-inch diameter for each 1-inch diameter of tree removed. Under the City of Sacramento tree ordinance, heritage trees include any tree 36-inch diameter or greater in a riparian zone. Removal of a heritage tree requires a permit from the City of Sacramento. Heritage trees are also potential nesting habitat for birds, including the state threatened Swainson's hawk. All of the alignments have potential to affect several heritage trees, depending on project design and construction techniques.

Technical Analysis Requirements. Surveys and technical studies required include a general biological field survey to map plant communities and assess habitat conditions, special-status plant survey, wetland delineation, Natural Environment Study (NES), Biological Assessment (BA) for USFWS, and Biological Assessment/Essential Fish Habitat Assessment for NMFS.

Comparison of Alternatives. Because they pass through similar habitats with similar intensity of effects, the alignment alternatives are not substantially different in regards to the constraints that sensitive biological resources would pose on a new bridge crossing in the study area.

Cultural Resources

The study area is located at the interface of two Native American tribes—the Patwin (or Wintun) and the Nisenan Maidu. The banks of the Sacramento River and associated riparian and tule marshland habitats were inhabited by the River or Valley Patwin. The Nisenan (also called Southern Maidu), while primarily occupying territories east of the Sacramento River, used land west of the river as well (Johnson, 1978:350, Figure 1; Levy 1978:Figure 1; Wilson and Towne 1978:Figure 1).

The approximate maximum extent of Patwin territory in the late eighteenth and early nineteenth centuries was from the town of Princeton in Colusa County south to Suisun Bay and from the Sacramento River west across the eastern slope of the Coast Range (Johnson, 1978). The tribelet was the broadest apparent unit of political organization among the Patwin. The territory typically includes a permanent principal settlement or village and a number of subordinate villages that may or may not have been permanently occupied. Each village in a Patwin tribelet also had a chief (Johnson, 1978:354).

The Nisenan, while primarily occupying territories east of the Sacramento River, used land west of the river as well. The Valley Nisenan lived in the Sacramento Valley from the Feather River north of Marysville to the Sacramento River just south of its confluence with the American River. Nearby the study area, there were three well-known villages that were part of the larger system of tribelets and tribelet centers. Pushune, also known as Pusune, was an important, influential village situated on the north bank of the American River; it exchanged labor and trade relations with the European settlers. The villages of Momol and Sacum'ne (also known as Sekumni) were located near the study area on the Sacramento River. Although they were not as influential as Pushune, these villages also had exchanges with European settlers (Kroeber, 1925; Secrest, 2003; Wilson and Towne, 1978).

The Sacramento River was a convenient landmark for the early explorations that also facilitated reconnaissance of the Sacramento Valley. The Spanish, in 1817, were the first Europeans to traverse the portion of Sacramento River that passes next to the study area, having made an exploratory boat trip up the river as far as its confluence with the Feather River. This expedition was followed by a series of Spanish, Russian, British, and American land and water forays up the Sacramento River from the 1820s through the 1840s.

The Sacramento River was generally situated in its present position, although it was considerably wider (ERM, 2002:Figure 1-5; Ray, 1873). The 1848 gold discovery at Coloma, however, was responsible for the vast increase in population through the 1850s, as Sutter's embarcadero, at what is now Old Sacramento, served as the principal point of departure for persons and goods headed for the Sierra Nevada diggings. By the turn of the nineteenth century and several decades into the twentieth, development of the built-environment within the study area increased and evolved to include circulation systems in the form of highways, bridges, and viaducts. Post-World War II, commercial and industrial buildings also developed over time within the study area.

Constraints relating to cultural resources include the known archaeological sites (which cannot be made public); unknown buried archaeological deposits, and built environment resources (e.g., levees, pilings) that have not yet been evaluated for eligibility on historic registers. The entire study area is potentially sensitive for cultural resources.

Cultural resource sites, particularly prehistoric archaeological sites, are commonly concentrated along natural waterways such as the Sacramento River. Village sites were commonly located along these waterways. Excavations over the years have repeatedly uncovered prehistoric sites buried in deep sediments. For example, an archaeological deposit located along the Sacramento River near the study area was reported to possess a deep midden deposit ranging from 8 to 10 feet below the surface. As a result of the nature of archaeological deposits, it is impossible to predict exactly where these sites are. Therefore, no particular alignment is considered more or less sensitive for archaeological resources than the other. Either alignment has the same potential to affect archaeological resources.

Levees on both sides of the river are over 50 years old and may be considered historic resources. The levee on the West Sacramento side of the river is a part of the Reclamation District (RD) 900 levee system. Levee construction for RD 900 began on April 15, 1911. Completed by 1915, the RD 900 levee in east Yolo County was constructed to a height of 24 feet, with a top width of 80 feet.

A previous cultural resources records search identified an archaeological site (CA-Sac-505-H) in the study area on the east bank of the Sacramento River. This historic-era site contained various historic refuse from the late nineteenth/early twentieth century (fragments of glass, ceramic, metal, brick, porcelain, and cut bone).

Technical Analysis Requirements. In order to comply with Section 106, an Area of Potential Effects (APE) map, Historic Property Survey Report (HPSR), Archaeological Survey Report (ASR), and Historic Resources Evaluation Report (HRER) will be prepared consistent with Caltrans' guidelines.

Comparison of Alternatives. Effects on cultural resources would be similar regardless of alternative. None of the alternatives are considered more or less sensitive for archaeological resources than the other and they each have the same potential to affect archaeological resources. None of the alignment alternatives would affect CA-Sac-505-H to any greater degree than the other.

Any of the proposed alternative alignments would span the levees on either side of the river. This would potentially affect either levee, each of which is over 45 years old. Based on previous and ongoing determinations of other levee segments, it is likely that levees within the study area would be determined eligible for listing in the NRHP/CRHR. However, unless the project proposed to construct a setback levee (essentially leaving the original levee open to erosion and deterioration), project activities under either alternative would not affect their eligibility determinations.

Air Quality

The primary pollutants of concern in the study area are ozone (O_3) and its precursors, reactive organic gases (ROG) and nitrogen oxides (NO_X), as well as carbon monoxide (CO), particulate matter (PM10, and PM2.5, particulate matter up to 10 micrometers in diameter and up to 2.5 micrometers in diameter, respectively). O_3, PM10, and PM2.5 are considered to be regional pollutants because they affect air

quality on a regional scale. NO_2 reacts photochemically with ROG to form O_3, while PM10 and PM2.5 can form from chemical reaction of atmospheric chemicals, including NO_X, sulfates, nitrates, and ammonia. These processes can occur at some distance downwind of the source of pollutants. Pollutants, such as CO, are considered to be local pollutants because they tend to disperse rapidly with distance from the source. Although PM10 and PM2.5 are regional pollutants, they can also be localized pollutants, as direct emissions of PM10 from automobile exhaust can accumulate in the air locally near the emission source.

Sensitive Land Uses. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. According to CARB, sensitive individuals refer to those segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with preexisting serious health problems affected by air quality). Land uses where sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities, convalescent centers, and retirement homes. (CARB, 2005). Within the study area, sensitive land uses include Fredrick Miller Regional Park and the Sacramento River Parkway. Nearby sensitive land uses include the West Sacramento Medical Center on 15th Street and adjacent residential areas, all west of Jefferson Boulevard. East of the study area in Sacramento is O'Neil Park on Broadway.

Existing Air Quality Conditions. The monitoring station closest to the study area is within SMAQMD's jurisdiction. The Sacramento T Street Monitoring Station is located approximately 1.2 miles to the east. No standards were exceeded at the monitoring station for CO, NO_2, or SO_2 between 2011 and 2014. The federal 8-hour O_3 standard was exceeded between 0 and 9 times annually, and the state 8-hour O_3 standard was exceeded 1 time in 2011 and 4 times in 2012. The state one-hour O_3 standard was exceeded 1 time in 2011 and 2012. The federal PM10 and PM2.5 standards were not exceeded between 2011 and 2014. The state 24-hour PM10 standard was exceeded 21 times in 2013 and 4 times in 2014. The state 24-hour PM2.5 standard was exceeded 6 times in 2011 and 2 times in 2013.

Attainment Status. In the study area, the regulation of air quality on the east side of the Sacramento River is under the jurisdiction of SMAQMD. The U.S. Environmental Protection Agency (USEPA) designates Sacramento County as nonattainment for O_3, PM2.5, unclassified/attainment for lead and NO_2, and maintenance for PM10 and CO. The regulation of air quality on the west side of the Sacramento River is under the jurisdiction of Yolo-Solano AQMD. The USEPA designates Yolo County as nonattainment for O_3, PM2.5, unclassified/attainment for PM10, lead and NO_2, and maintenance for CO.

Operational air quality emissions are based on traffic data prepared specifically for the proposed project and would differ depending on the number of lanes selected to be built and the operational differences between the connection configuration differences of the alternatives at 5th Street in West Sacramento.

Construction emissions would include fugitive dust and exhaust from equipment, trucks, and worker vehicles. Construction activity would generate emissions related to volatile organic compounds, NO_X, CO, PM2.5, PM10, and greenhouse gasses.

Technical Analysis Requirements. An Air Quality Study Report, Air Quality Conformity Analysis, and Conformity Analysis Documentation checklist will be required, prepared consistent with Caltrans' guidelines and federal conformity requirements. Both construction and operational emissions will need be modeled. Regional conformity will need to be demonstrated and interagency consultation will need to occur regarding whether the project is considered a project of air quality concern based on the USEPA's Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM2.5 and PM10 Nonattainment and Maintenance Area.

Comparison of Alternatives. Though the alignments are slightly different as they cross the Sacramento River, the operational emissions are expected to be similar and the emissions would need to meet

regional and federal conformity requirements. Emission differences between the alternatives will depend on the outcome of the modeled traffic data from the project's traffic study.

Alignment alternatives A, B, C1, and C2 are generally equally proximate to sensitive land uses. Alignment D is within Fredrick Miller Regional Park. Sensitive land uses could experience temporary increases in emissions from construction activities and may experience operational emission changes as well, depending on the results of the traffic operations analysis. Construction activities closer to those uses would result in greater effects though due to the overall proximity of the alignments to each other the differences in effects would be small. Changes in air emissions from operation of the new bridge would be generally independent of bridge alignment. Therefore, there is no substantial difference between the alignments as they relate to air quality.

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