Chapter 20
Transportation and Traffic

20.1 Affected Environment

This section describes the existing transportation network in the primary and extended study areas – specifically those roads, highways, bridges, railroads, ports, transit, navigation, and airports that could be affected by the SLWRI action alternatives.

20.1.1 Roadways

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

The primary study area comprises Shasta Dam, Shasta Lake, and the upper Sacramento River between Shasta Dam and the Red Bluff Pumping Plant in Shasta and Tehama counties. The surface transportation network in the primary study area consists of an interstate freeway, State highways, and smaller connector roads. Traffic in the area is generally moderate to light, except that heavy traffic in the Shasta Lake Unit of the Whiskeytown-Shasta-Trinity National Recreation Area is not unusual during weekends and holidays between May 1 and Labor Day (Reclamation 2004).

Figure 1-1 in Chapter 1, "Introduction," shows the highways in the primary study area. Interstate 5 (I-5) is the main north-south interstate freeway in the region. Several major arterials run north-south, generally parallel to the Sacramento River. State Route (SR) 99 and SR 70 run north-south; certain sections of both of these routes are expressways. SR 273 runs north-south from Redding, generally paralleling the Sacramento River before it intersects with I-5 several miles north of the Shasta/Tehama county line.

Roadways in the vicinity of Shasta Lake are shown in Figure 20-1a (see Section 20.3.1, Methods and Assumptions). Roadways and bridges in the primary study area that could be affected by the SLWRI include Lakeshore Drive, Silverthorn Road, Gillman Road, and Salt Creek Road. These roads are described in more detail below.

Lakeshore Drive is a two-lane paved road that begins in the Lakeshore Area, immediately west of I-5, and continues south to the Sugarloaf Creek. Some segments of Lakeshore Drive are owned and maintained by Shasta County and some segments are owned and maintained by USFS.

Silverthorn Road is a two-lane paved road and provides access to the Silverthorn Area. Silverthorn Road is owned and maintained by Shasta County.

Gillman Road is a two-lane paved road that runs along the west side of the McCloud River Arm portion of Shasta Lake. Gillman Road is owned and maintained by Shasta County.

Salt Creek Road is an unpaved road, ranging from 10 to 12 feet wide and runs along the west side of the Squaw Creek Arm portion of Shasta Lake. Salt Creek Road is owned and operated by USFS.

Bridges in the primary study area include Antlers Bridge and Pit River Bridge (also carries Union Pacific Railroad), which are located along I-5; Doney Creek Bridge and Charlie Creek Bridge, which are located along Lakeshore Drive; McCloud River Bridge, which is located along Gillman Road; and Didallas Creek Bridge, which is located along Salt Creek Road. A new Antlers Bridge is currently under construction and will accommodate raises of Shasta Dam up to 18.5 feet (Caltrans and Federal Highway Administration 2007).

Every 3 years, the California Department of Transportation (Caltrans) collects traffic at the I-5/Turntable Bay Road and I-5/Bridge Bay Road interchanges for an 8-day period between April and June. Table 20-1 shows the average daily traffic counts for these interchanges in 2003, 2006, and 2009. These data provide a general sense of the amount of traffic accessing the Shasta Lake area from I-5.

Table 20-1. Average Daily Traffic Volume at the I-5/Turntable Bay Road and I-5/Bridge Bay Road Interchanges

Location	Average Daily Traffic Volumes		
	2003	2006	2009
Turntable Bay Road northbound off-ramp	170	210	150
Turntable Bay Road northbound on-ramp	150	150	180
Turntable Bay Road southbound off-ramp	35	40	65
Turntable Bay Road southbound on-ramp	65	100	70
Bridge Bay Road northbound off-ramp	310	360	210
Bridge Bay Road northbound on-ramp	60	60	40
Bridge Bay Road southbound off-ramp	85	100	65
Bridge Bay Road southbound on-ramp	350	400	220

Source: Caltrans 2011

Key:
I-5 = Interstate 5

SR 299 is the major east-west route. This route traverses Trinity, Shasta, Lassen, and Modoc counties north of Shasta Dam. SR 44 is another major east-

west route farther south that traverses Shasta County near the city of Redding. SR 36, which also runs generally east-west, intersects with SR 99 and I-5, and this route crosses the Sacramento River near the city of Red Bluff.

Between Shasta Dam and Keswick Dam, one vehicular bridge spans the Sacramento River. Between Keswick Dam and Red Bluff Pumping Plant along the Sacramento River, 3 pedestrian bridges, 1 railroad bridge, and 14 vehicular bridges (3 of which are for I-5) span the Sacramento River.

There are 317 bridges in Shasta County, 220 of which have bridge spans of 20 feet or more, making them eligible for Federal aid. Ninety-four bridges are beyond their design lives, functionally obsolete, or structurally deficient (Shasta County RTPA 2010).

Lower Sacramento River and Delta

SR 45 follows the Sacramento River north from SR 113 in Knights Landing, north of Sacramento. I-5 parallels SR 45 and the Sacramento River to the west. On the west side of the Sacramento Valley, SR 29 runs north-south through Napa and Lake counties. East-west highways include SR 20 in Lake County, SR 162 in Glenn County, and SR 36 in Tehama and Trinity counties. Major east-west routes on the east side of the Sacramento Valley include SRs 70, 49, and 88; U.S. Highway 50; and Interstate 80.

The Delta region is served by several major freeways. I-5 and SR 99 run north-south and Interstate 80 and U.S. Highway 50 run east-west through Sacramento. Other highways extend from the cities of Sacramento and Stockton to small cities and towns in the region. New roadways have facilitated growth and urbanization along their corridors and within the upper watersheds of major inflowing rivers. Local roads in the Delta are often narrow and winding; during peak travel times, traffic in this area often includes slow, oversized farm equipment.

The 2 major north-south freeways in the San Joaquin River area are I-5 and SR 99, which pass through the San Joaquin Valley from Sacramento through Stockton and continue on to Bakersfield and its vicinity. SR 41 runs in a north-south direction south of Fresno. Several east-west routes traverse the San Joaquin River basin: SR 152 is an expressway that connects Los Banos and Chowchilla in Madera County, SR 180 terminates in Yosemite National Park, SR 168 is a primary east-west route in Fresno County, and SRs 190 and 198 are primary routes in Tulare County.

CVP/SWP Service Areas

Numerous freeways and expressways serve portions of the CVP and SWP service areas not discussed above. U.S. Highway 101 extends north and south near the coast from San Luis Obispo south to Los Angeles, and I-5 runs north-south through the Central Valley to Los Angeles and on to San Diego. An extensive, intricate freeway system serves the Los Angeles area. I-10 runs east

from Los Angeles to Arizona, while I-8 runs east-west from San Diego to Arizona.

20.1.2 Public Transit

Public transit service in the primary study area is provided by the Redding Area Bus Authority (RABA), which provides fixed-route and demand-responsive (paratransit) service. RABA operates 12 fixed routes within the cities of Redding, Shasta Lake, and Anderson. Shasta County contracts with RABA for a rural commuter bus service. This commuter service offers express transportation into Redding from the outlying community of Burney. The RABA demand/response system provides complimentary transportation to disabled residents of the fixed-route service area. The service area is generally within 0.75 mile of the fixed routes, complying with the minimum mandates of the Federal Americans with Disabilities Act.

Most urban areas in the extended study area provide public transit. These transit systems generally provide both fixed-route and paratransit service. Transit services in the extended study area are not discussed further because they would not be affected by any of the alternatives.

20.1.3 Railroads

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

The Union Pacific Railroad (UPRR) and Western Pacific Railroad both have rail lines serving the vicinity of Shasta Lake and the upper Sacramento River area. The UPRR main line follows the I-5 alignment. Railroad bridges in the area include the Pit River Bridge (which carries both the railroad and I-5), the Sacramento River Second Crossing Railroad Bridge, and the Doney Creek Railroad Bridge. All three railroad bridges were constructed by Reclamation during the original construction period of Shasta Dam. The Engineering Appendix includes additional information on each of these railroad bridges.

The Pit River Bridge would require relocation or major modifications for Shasta Dam raises greater than about 18.5 feet. The Plan Formulation Appendix provides additional information on the limitations that the existing Pit River Bridge places on potential dam enlargements. Lower Sacramento River and Delta

UPRR is the main rail line serving the Sacramento River region. The UPRR alignment approximates the alignment of I-5. The Western Pacific rail lines extend farther east through the cities of Marysville and Oroville.

Rail lines serving the Delta are the UPRR; the Western Pacific Railroad; and the Atchison, Topeka, and Santa Fe Railway.

The UPRR and Atchison, Topeka, and Santa Fe lines provide primary rail service connecting the Delta region to the San Joaquin River basin. The

alignments of these rail lines generally follow the I-5 alignment through the San Joaquin Valley.

CVP/SWP Service Areas

The UPRR line runs north-south near the coast, from the San Francisco Bay Area through Los Angeles, then southeast toward the Arizona/Mexico border.

20.1.4 Water Navigation

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

The means of water travel and navigation in the primary study area consist of smaller watercraft such as kayaks and canoes, as well as motorboats for fishing, water-skiing, and boating. Shasta Lake is a popular destination for houseboats. A 65-foot-long catamaran provides ferry service to the Shasta Caverns on the east side of the McCloud Arm of Shasta Lake. Water flows and depths in this segment of the Sacramento River limit river navigation to smaller watercraft. Additional information on recreational boating in the primary study area, especially at Shasta Lake, is included in Chapter 18, "Recreation."

Lower Sacramento River and Delta

The Port of Sacramento is located in West Sacramento in the southeastern part of Yolo County. Ship access to the port is provided from San Francisco Bay up the Sacramento River and through the Sacramento Deep Water Ship Channel. San Francisco Bay is approximately 80 nautical miles southwest of the Port of Sacramento. This route provides direct and unrestricted passage to the port (City of Sacramento 2005).

Two ports are located along the Sacramento River between Sacramento and Walnut Grove. Another commercial port is located on the Sacramento River at Isleton. A commercial port is located near Terminous and two ports are located adjacent to each other on Old and Middle rivers, northeast of Brentwood (CALFED 2000a). The Port of Stockton is on the San Joaquin River. A deep-water ship channel runs from Cache Slough in the Delta to West Sacramento, where the Port of Sacramento is located.

There are no commercial ports or shipping routes on the San Joaquin River upstream from the Port of Stockton.

CVP/SWP Service Areas

The Los Angeles–Long Beach installation on San Pedro Bay is one of the leading ports of California. The growth of Los Angeles led to the creation of its artificial harbors. Other harbors in this area serving commercial shipping are the San Luis Obispo, Santa Barbara, Carpinteria, Port Hueneme, El Segundo, Los Angeles, Long Beach, and San Diego harbors (CALFED 2000b).

20.1.5 Airports

There are four airports in the primary study area: Redding Municipal Airport, Benton Airpark, Shingletown Airport, and Fall River Mills Airport. Redding Municipal Airport, the closest airport to the project site, is located 20 miles southeast of Shasta Dam in Redding. Seaplanes are also permitted to land at Shasta Lake at the Bridge Bay Resort Seaplane Base. More than 120 other airports exist in the extended study area; these airports are not relevant to the environmental analysis and thus are not discussed further.

20.2 Regulatory Framework

20.2.1 Federal

Several statutes and regulations include provisions specific to the interstate system in California and transportation projects in general. Title 23 of the U.S. Code and the Code of Federal Regulations govern highways; the laws for transportation are included in U.S. Code Title 23 and Code of Federal Regulations Title 49.

The following Federal legislative statutes may also apply to surface transportation and transportation aspects of the project:

- Federal Clean Air Act
- Federal Transit Act
- Americans with Disabilities Act
- Civil Rights Act
- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

The Federal Highway Administration issues directives and policy memoranda in the form of technical advisories, orders, and notices for Federally funded roadway and transit projects in California.

20.2.2 State

Caltrans plans, designs, constructs, and maintains State-owned roadways. Caltrans's standard specifications (Caltrans 2006) establish uniform design and construction procedures for California highways and local roads. The highway design criteria and policies in the standard specifications ensure minimum design, contract, and construction standards for projects.

The primary study area is in Caltrans District 2, headquartered in Redding. Caltrans's Division of Transportation Planning, System Planning Branch, conducts long-range transportation plans in cooperation with local agencies to

identify future highway improvements; the Division of Transportation Programming sets priorities for various Federal and State transportation funding programs.

20.2.3 Regional and Local

The circulation elements in the general plans of California cities and counties are concerned with the movement of people and goods. Section 65302(b) of the California Government Code requires that circulation elements address the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, and other local public utilities and facilities (Shasta County 2004).

Circulation elements establish goals and policies that pertain to transportation-related activities on city- or county-maintained roads. Most general plans contain circulation goals related to levels of service. “Level of service” describes the efficiency of road segments and intersections in terms of traffic delays. Level of service guidelines address long-term planning objectives rather than temporary conditions related to temporary, short-term traffic delays resulting from construction activities.

Counties in California classify county-maintained roads according to their intended function and linkage to land uses. Major roads are generally defined as primary carriers of intercity and intracounty travel. Collector roads are intended to provide subregional access and circulation by linking major roads with residential streets.

The Shasta County Regional Transportation Planning Agency is the congestion management agency in Shasta County. In 2010, the agency issued the *Regional Transportation Plan for Shasta County* in accordance with California Government Code Section 65080 et seq. and 23 U.S. Code 134–135 et seq. The plan discusses regional transportation issues, problems, and solutions and includes goals and objectives for each transportation mode and area of concern.

The Tehama County Transportation Commission is the regional transportation planning agency. It develops policies and allocates transportation funds in Tehama County. The commission published the 2006 *Tehama County Regional Transportation Plan* and is responsible for updating the plan.

Local agencies administer various transportation-related revenues that are sent directly to the agencies. The funds provide for the planning, design, operation, and maintenance of roadways and bridges. The Federal government provides matching funds under local assistance programs established under the Surface Transportation Improvement Program and Highway Bridge Rehabilitation and Replacement Program.

20.3 Environmental Consequences and Mitigation Measures

This section evaluates the environmental consequences of each project alternative related to traffic and transportation. The methods of evaluation are explained and the assumptions used to conduct the evaluation are listed below, and the criteria used to determine the significance of impacts are described. Mitigation measures are recommended to avoid or reduce any potentially significant impacts to less-than-significant levels.

20.3.1 Methods and Assumptions

Level of service standards are typically used to evaluate long-term (operational) traffic impacts resulting from residential, employment-generating, industrial, and institutional development projects. The SLWRI is not a land use development project. Long-term operation of the project alternatives would not generate additional residential, employment-related, industrial, or institutional vehicular trips (other than an increase in trips from additional recreation use); therefore, this analysis focuses on construction-related traffic effects. Level of service standards were not used in this analysis because such standards are typically used to evaluate long-term traffic congestion resulting from operations under a proposed action.

Figures 20-1a through 20-1g below show the locations of transportation facilities that would be relocated under the project alternatives. Table 20-2 lists the named roads and bridges that would require relocation and identifies the map figure that shows each facility. The facilities that would be relocated under each alternative are described with greater specificity in the associated impact evaluation that follows.

Table 20-2. Named Road and Bridge Facilities that Would Require Relocation Under the SLWRI

Roads and Bridges	Map Figure	CP1	CP2	CP3	CP4	CP5
Lakeshore Drive	20-1f	X	X	X	X	X
Doney Creek Bridge	20-1f	X	X	X	X	X
Charlie Creek Bridge	20-1f	X	X	X	X	X
Silverthorn Road	20-1c	X	X	X	X	X
Gillman Road	20-1g		X	X	X	X
McCloud River Bridge	20-1g		X	X	X	X
Salt Creek Road	20-1d		X	X	X	X
Didallas Creek Bridge	20-1d		X	X	X	X

Key:
CP = Comprehensive Plan
SLWRI = Shasta Lake Water Resources Investigation

The following project-related assumptions were used in the analysis of construction-related traffic that would result from needed roadway and bridge relocations and the dam raise:

- The estimated duration of proposed construction activities related to all major features would be 4.5 years for CP1 and 5 years for CP2–CP5. Construction activities would be phased, when feasible; however, some construction activities would occur concurrently.

- Import of fill and construction materials (aggregate, cobble, sand, and concrete) and export of construction waste related to construction of all major facilities would result in 95–177 truck trips per day for 4.5 to 5 years, with a maximum haul route distance of up to 20 miles. Export of vegetation cleared from the primary study area would result in 52–75 round trips per day, with a maximum haul route distance of up to 20 miles for up to 3.5 years.

- The estimated construction labor force for CP1–CP5 would be 300–360 workers per year, resulting in 300–360 daily round trips for 4.5 to 5 years.

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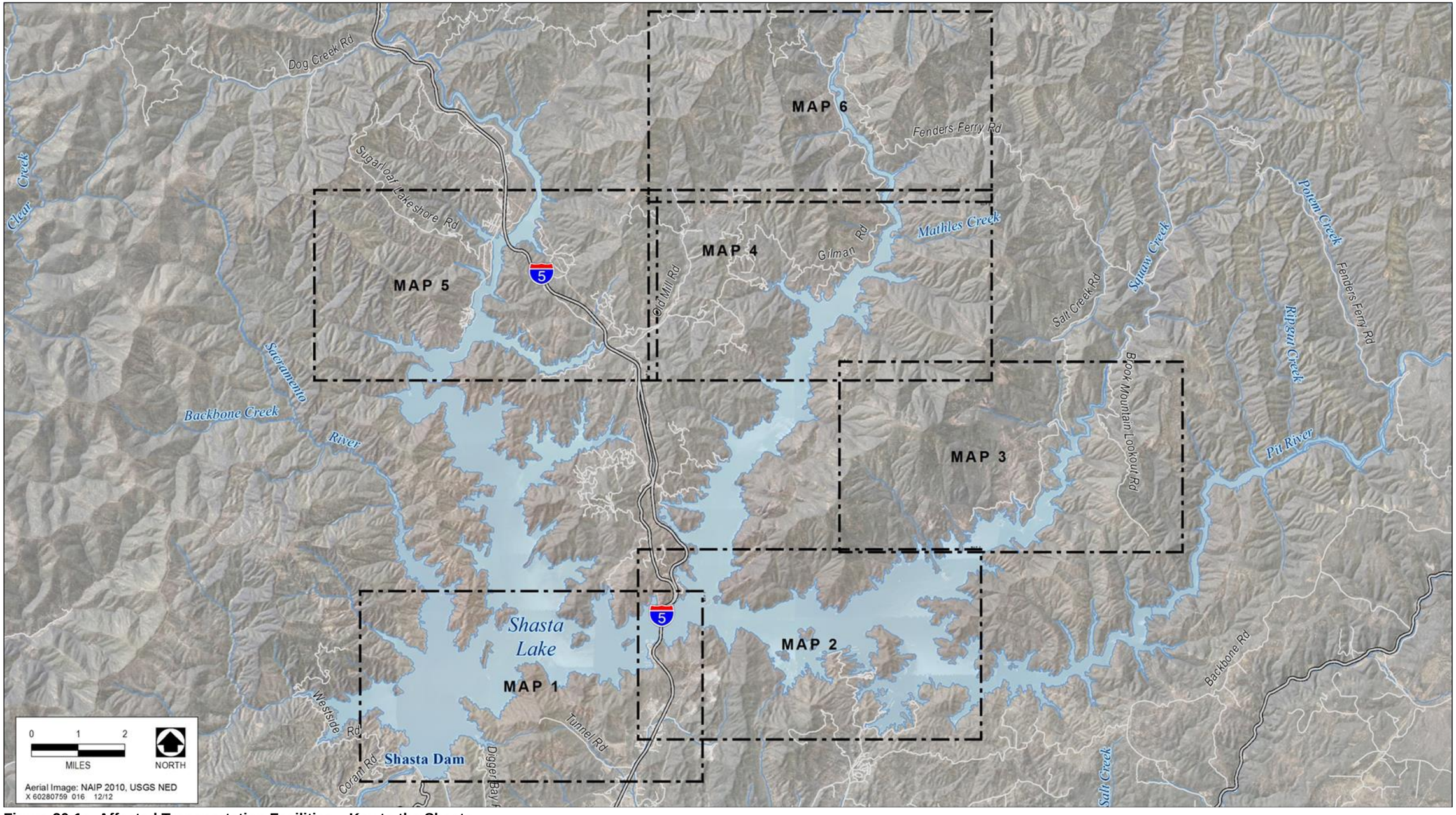

Figure 20-1a. Affected Transportation Facilities – Key to the Sheets

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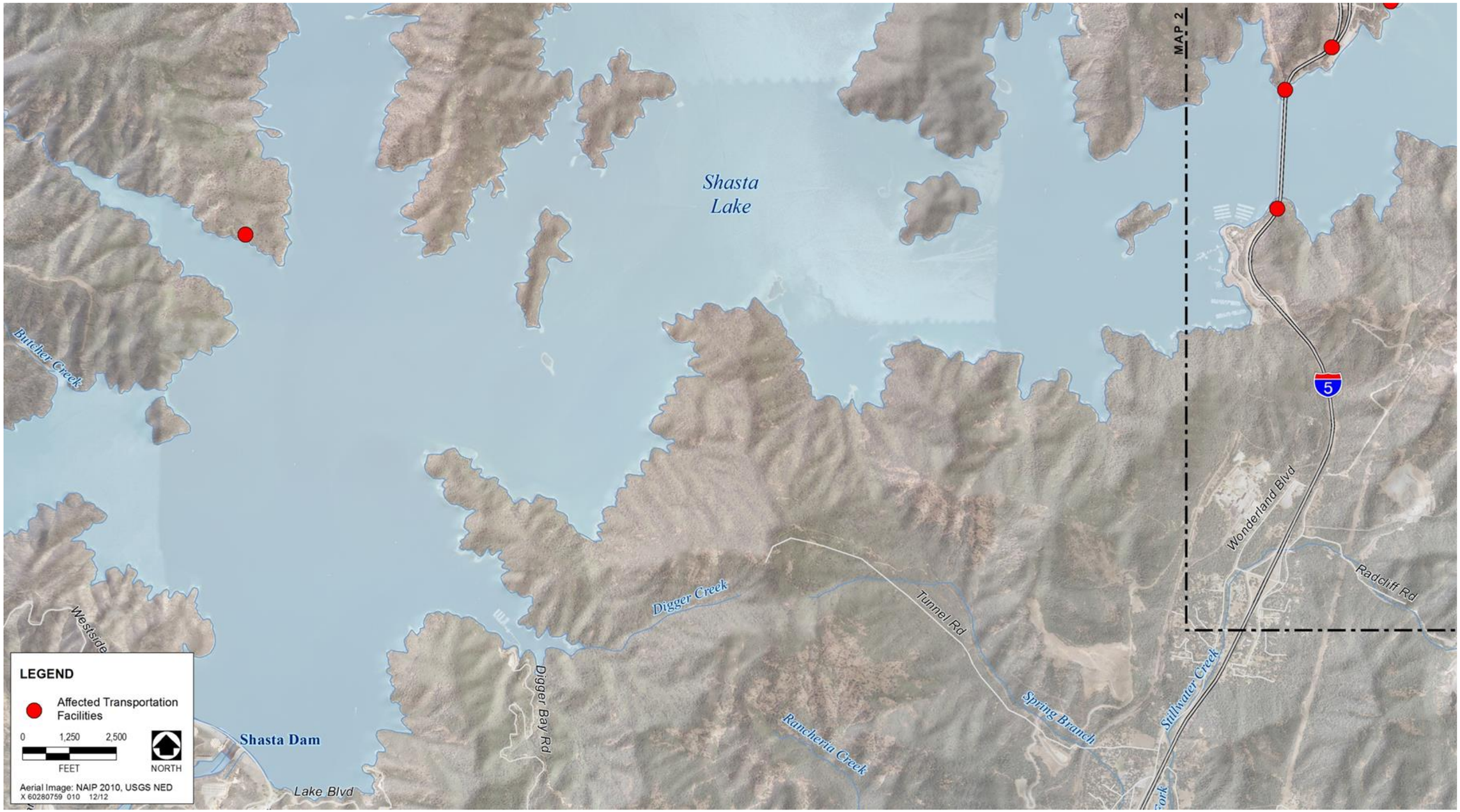

Figure 20-1b. Affected Transportation Facilities – Map 1

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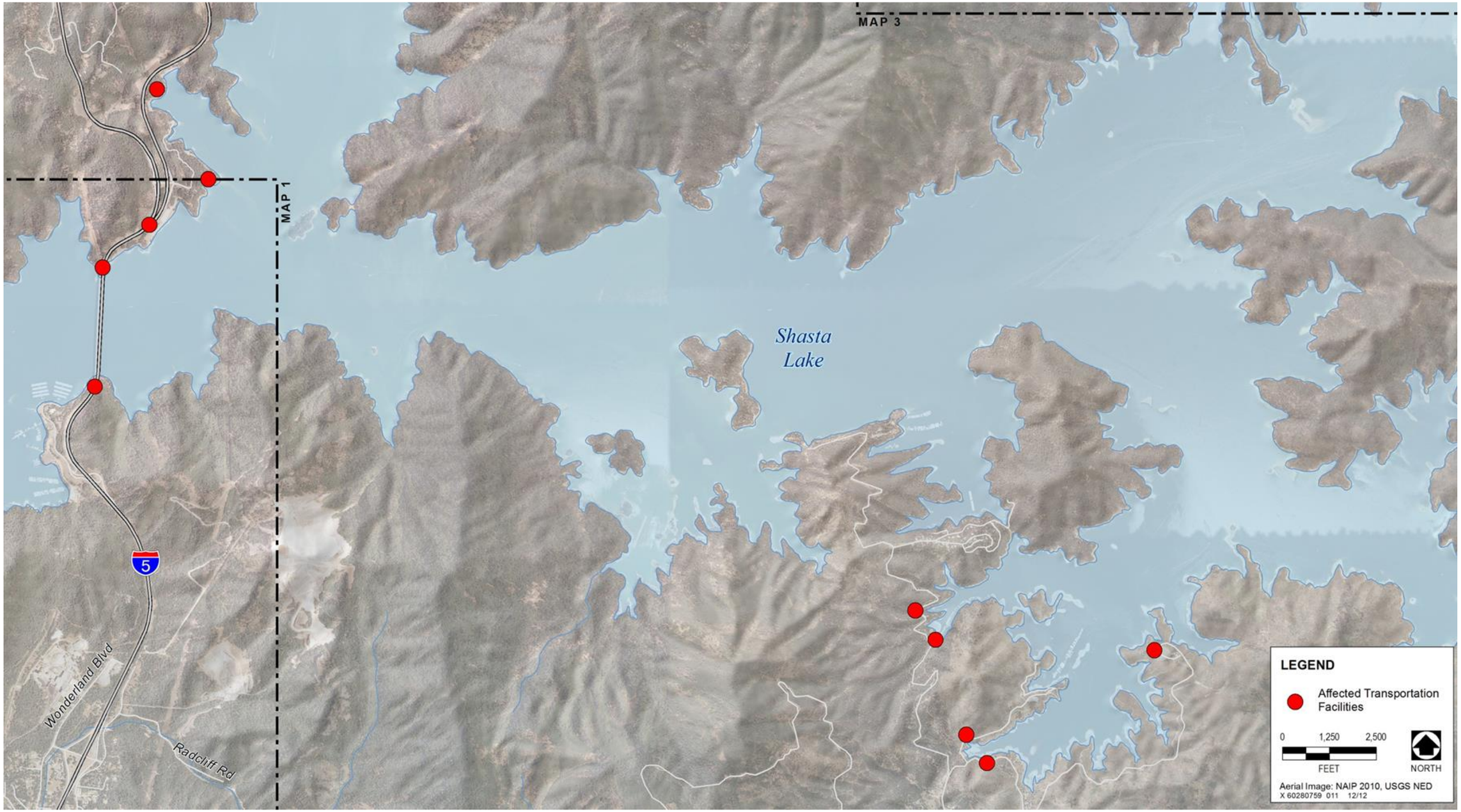

Figure 20-1c. Affected Transportation Facilities – Map 2

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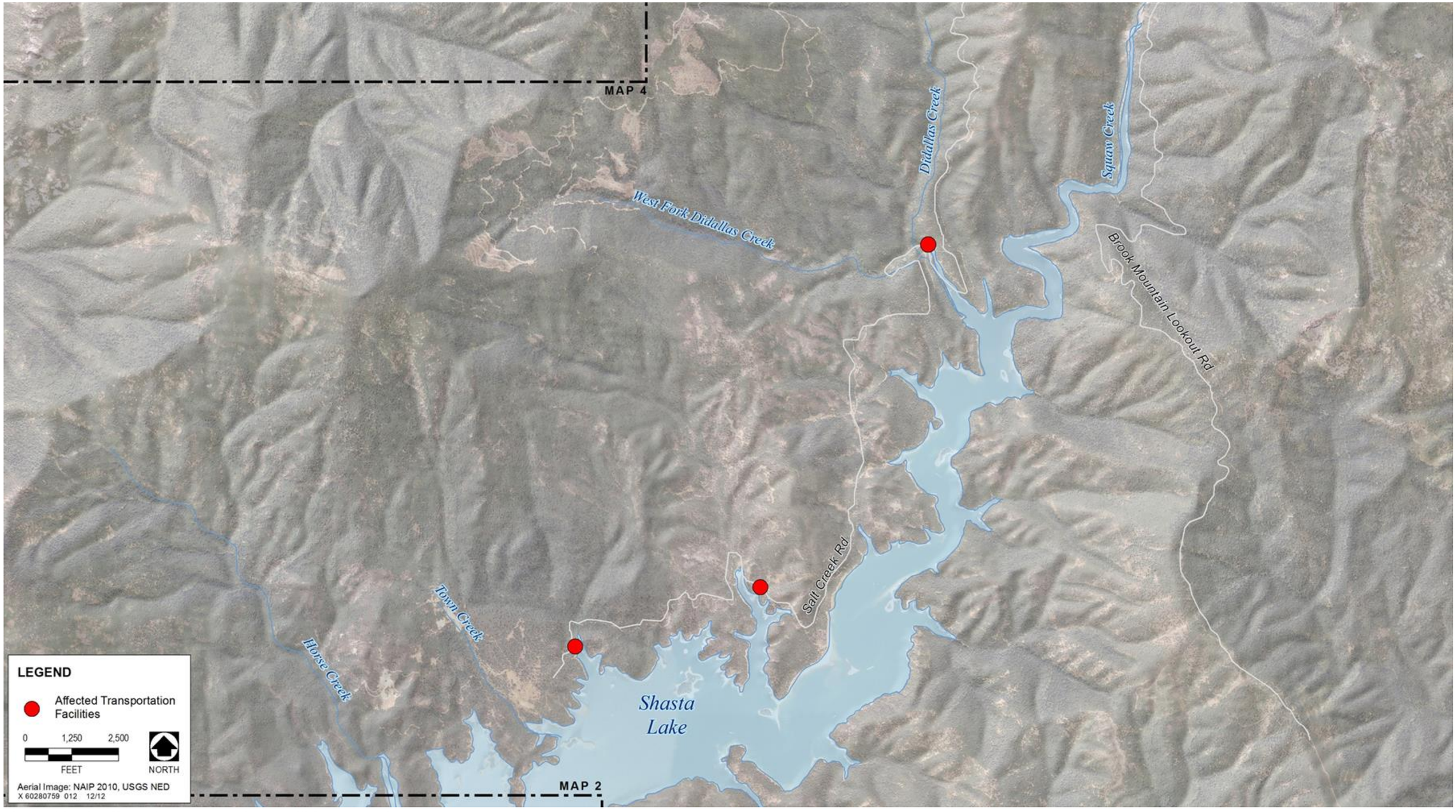

Figure 20-1d. Affected Transportation Facilities – Map 3

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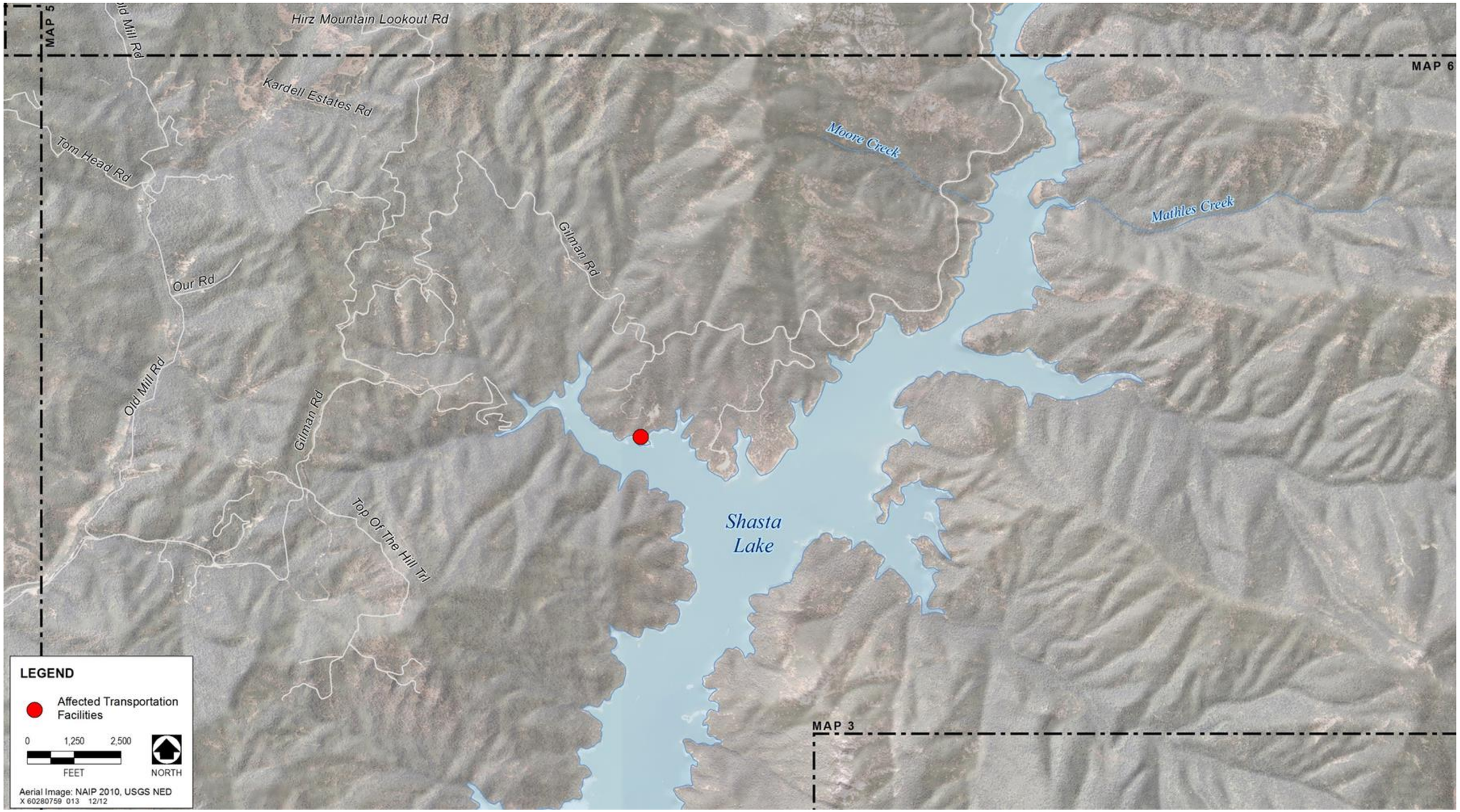

Figure 20-1e. Affected Transportation Facilities – Map 4

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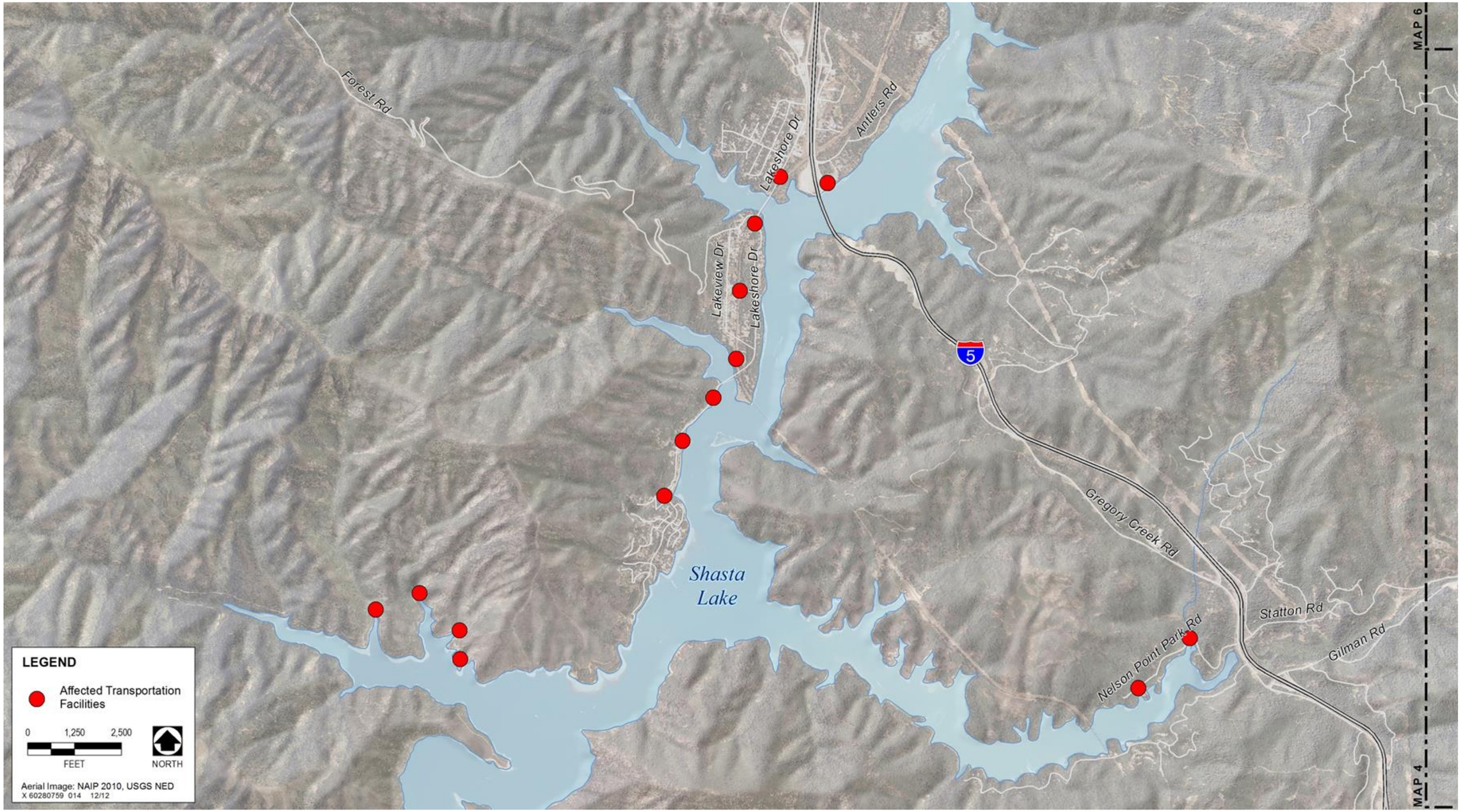

Figure 20-1f. Affected Transportation Facilities – Map 5

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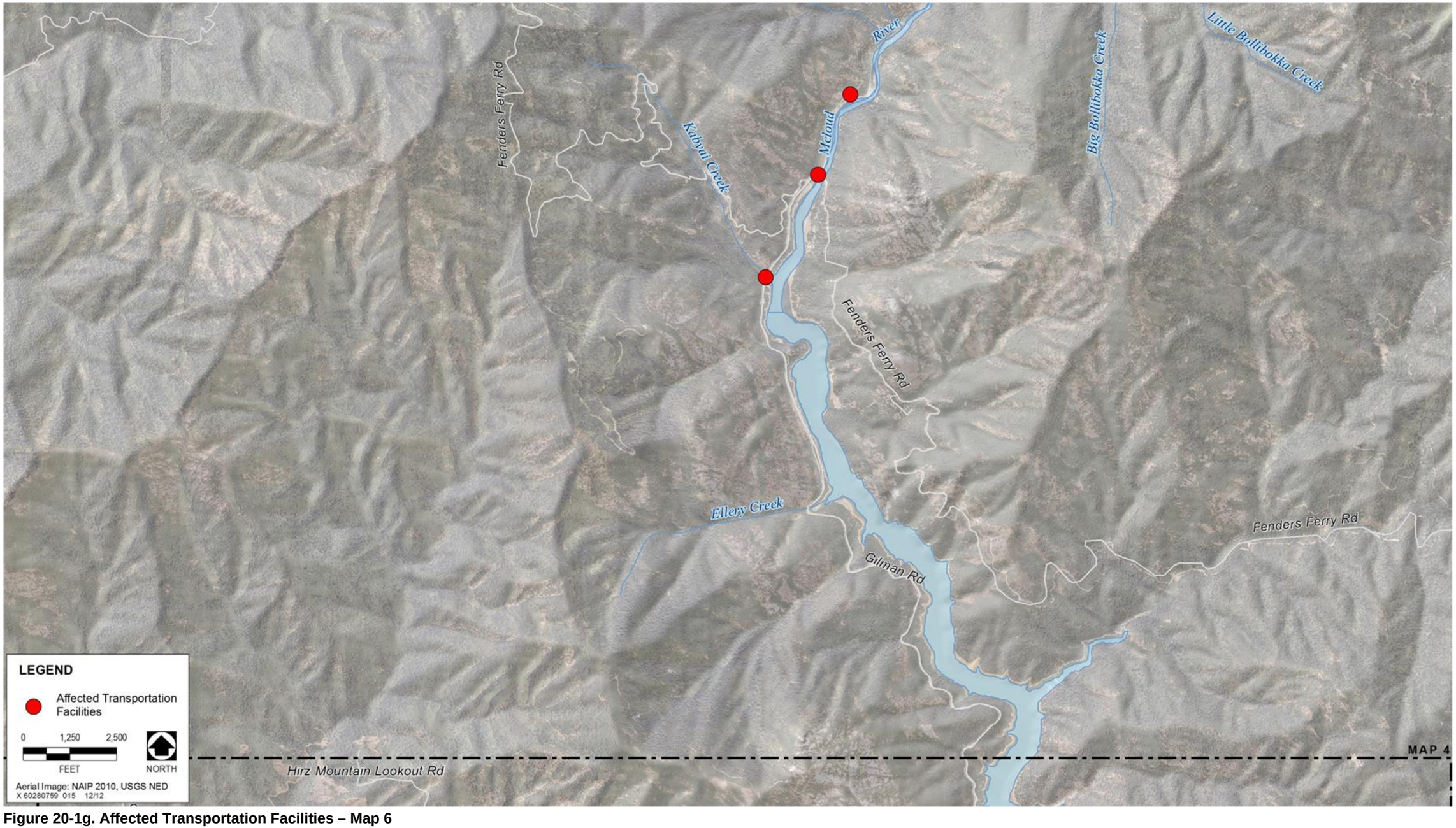

Figure 20-1g. Affected Transportation Facilities – Map 6

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- Existing access roads would be used to the extent feasible during construction. However, should temporary access roads need to be constructed, temporary fill for access would be completely removed after construction is completed.

- Construction would typically occur during daylight hours Monday through Friday, but the construction contractor may extend the hours and may schedule construction work on weekend days with the approval of Reclamation. The average workday would be 8 hours.

- Under CP4 and CP5, 5,000–10,000 tons of gravel on average would be installed per year at up to three sites per year. Gravel would be obtained from local commercial sources in Redding, and would result in up to 18 truck trips per day, with a maximum haul route distance of up to 40 miles. Under CP4 and CP5, gravel augmentation would continue to occur annually for an additional 5 years, for a total construction period of 10 years.

- Under CP4 and CP5, restoration at up to 6 restoration sites would result in up to 25 haul trips per day for approximately 1 month.

- The increase in long-term recreational opportunities and additional visitor days would generate an approximate average of 158 one-way trips per day to Shasta Lake and its tributaries under CP1, 238 one-way trips per day under CP2, 364 one-way trips per day under CP3, 658 one-way trips per day under CP4, and 311 one-way trips per day under CP5.

20.3.2 Criteria for Determining Significance of Effects

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by, or result from, the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. An environmental document prepared to comply with CEQA must identify the potentially significant environmental effects of a proposed project. A "[s]ignificant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (State CEQA Guidelines, Section 15382). CEQA also requires that the environmental document propose feasible measures to avoid or substantially reduce significant environmental effects (State CEQA Guidelines, Section 15126.4(a)) to less-than-significant levels.

Thresholds for determining the significance of transportation and traffic effects were based on the environmental checklist form in Appendix G of the State CEQA Guidelines and Federal, State, and local guidance. These thresholds consider the context and intensity of the environmental effects as required under NEPA.

Impacts of an alternative on transportation and traffic would be significant if project implementation would do any of the following:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and nonmotorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit

- Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks

- Substantially increase hazards as a result of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

- Result in inadequate emergency access

In accordance with NEPA, the methods for determining the significance of effects on traffic and transportation are based on the intensity of the effect within the context of the existing transportation facility.

The following screening criterion is recommended by the Institute of Transportation Engineers (ITE) (1989) for assessing the effects of construction projects that create temporary traffic increases. To account for the large percentage of heavy trucks associated with typical construction projects, ITE recommends a threshold level of 50 or more new peak-direction trips. Therefore, an alternative would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system, and thus would result in a significant effect related to traffic and transportation, if it would result in 50 or more new truck trips during the a.m. peak hours or the p.m. peak hours. The a.m. peak hours are between 7 and 9 a.m. and the p.m. peak hours are between 4 and 6 p.m.

20.3.3 Topics Eliminated from Further Consideration

Several categories of effects would not result from the No-Action Alternative or any of the action alternatives. These categories are described below. An analysis of potential effects in applicable categories for the No-Action Alternative and action alternatives follows this discussion.

None of the airports (Redding Municipal, Benton Airpark, Shingletown, and Fall River Mills) in the primary study area are located near the project site; therefore, project construction and operation would not affect air traffic patterns. In addition, the project would not affect the ability of seaplanes to land at Bridge Bay Resort Seaplane Base. For these reasons, air traffic patterns are not discussed further in this analysis.

None of the alternatives would interfere with RABA services or affect transit service. Therefore, transit is not discussed further in this analysis.

None of the alternatives propose any facility that is in conflict with adopted policies, plans, or programs supporting alternative transportation. Therefore, this issue is not discussed further in this analysis.

The alternatives do not propose any changes in land use; however, under the action alternatives there could be minor changes in land uses throughout the study area because of increased water supply reliability. These indirect effects would be extremely minor and spread over a wide geographic area (i.e., throughout the CVP and SWP service areas). Therefore, none of the action alternatives would increase transportation hazards because of incompatible uses. This issue is not discussed further in this analysis.

20.3.4 Direct and Indirect Effects

No-Action Alternative

Under the No-Action Alternative, no improvements to Shasta Dam would be constructed and none of the associated road and bridge relocations would be needed. It is expected that over time, as population and traffic levels increase, roads and bridges would be maintained and improvements would be constructed throughout the study area when needed to ensure safety and meet current engineering-design requirements. Also, growth occurring under the No-Action Alternative would likely be consistent with city and county general plans, resulting in effects on California's transportation network. The effects on and impact conclusions for the primary study area and extended study area are essentially the same.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Trans-1 (No-Action): Short-Term and Long-Term Increases in Traffic in the Primary Study Area in Relation to the Existing Traffic Load and Capacity of the Street System Traffic levels would not increase above levels anticipated in local general plans and regional transportation plans. This impact would be less than significant.

Under the No-Action Alternative, traffic would be expected to increase compared to existing conditions. Traffic in the primary study area would increase by amounts anticipated in local general plans and regional

transportation plans, and no construction-related truck trips would occur. Planned growth under the No-Action Alternative, including development of residential and recreational uses, has the potential to result in temporary, short-term increases in construction traffic. It is reasonable to assume, however, that necessary improvements to roads, bridges, and other transportation facilities would be made in response to increased traffic levels associated with increased population growth over time. Therefore, this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-2 (No-Action): Adverse Effects on Access to Local Streets or Adjacent Uses in the Primary Study Area Access to local streets and adjacent uses would remain generally unchanged. This impact would be less than significant.

Access to local streets and adjacent uses in the primary study area would be maintained under the No-Action Alternative. No adverse construction-related effects on access would occur. Planned growth under the No-Action Alternative has the potential to impede access to local streets and adjacent uses. It is reasonable to assume, however, that road and bridge improvements needed to maintain access would be made in accordance with city and county regulations and policies. For this reason, this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-3 (No-Action): Hazards in the Primary Study Area Caused by a Design Feature No design hazards or incompatible uses would be introduced. This impact would be less than significant.

No design hazards or incompatible uses would be introduced in the primary study area under the No-Action Alternative. No construction-related effects would occur. Planned growth under the No-Action Alternative has the potential to introduce design hazards or incompatible uses. It is reasonable to assume, however, that necessary actions would be taken in accordance with city and county policies and design standards. Therefore, this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-4 (No-Action): Adverse Effects on Emergency Access in the Primary Study Area Emergency access would remain unchanged. This impact would be less than significant.

Emergency access in the primary study area would remain unchanged under the No-Action Alternative. No construction-related effects would occur. Planned residential and recreation growth under the No-Action Alternative has the potential to affect emergency access during construction of roadway improvements to accommodate that growth. It is reasonable to assume, however, that necessary actions would be taken in accordance with city and county standards. Therefore, this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-5 (No-Action): Accelerated Degradation of Surface Transportation Facilities in the Primary Study Area No increase in road degradation would occur because no trucks would transport materials to and from the project site. This impact would be less than significant.

Because construction would not occur under the No-Action Alternative, trucks would not be required to transport construction materials to and from the primary study area. Therefore, road degradation would not increase as a result of construction. Planned growth under the No-Action Alternative has the potential to result in increased truck trips, with the secondary effect of road degradation. It is reasonable to assume, however, that necessary actions would be taken to accommodate planned growth over time. Therefore, this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact Trans-6 (No-Action): Temporary Increase in Traffic in the Extended Study Area in Relation to the Existing Traffic Load and Capacity of the Street System Traffic levels would not increase above levels anticipated in local general plans and regional transportation plans. This impact would be less than significant.

This impact is similar to Impact Trans-1 (No-Action) for the primary study area. For the same reasons as described under Impact Trans-1 (No-Action), this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-7 (No-Action): Adverse Effects on Access to Local Streets or Adjacent Uses in the Extended Study Area Access to local streets and adjacent uses would remain generally unchanged because no construction would occur. This impact would be less than significant.

This impact is similar to Impact Trans-2 (No-Action) for the primary study area. For the same reasons as described under Impact Trans-2 (No-Action), this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-8 (No-Action): Hazards in the Extended Study Area Caused by a Design Feature No design hazards or incompatible uses would be introduced. This impact would be less than significant.

This impact is similar to Impact Trans-3 (No-Action) for the primary study area. For the same reasons as described under Impact Trans-3 (No-Action), this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-9 (No-Action): Adverse Effects on Emergency Access in the Extended Study Area Emergency access would remain unchanged. This impact would be less than significant.

This impact is similar to Impact Trans-4 (No-Action) for the primary study area. For the same reasons as described under Impact Trans-4 (No-Action), this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

Impact Trans-10 (No-Action): Accelerated Degradation of Surface Transportation Facilities in the Extended Study Area No increase in road degradation would occur because no trucks would transport materials to and from the project site. This impact would be less than significant.

This impact is similar to Impact Trans-5 (No-Action) for the primary study area. For the same reasons as described under Impact Trans-5 (No-Action), this impact would be less than significant. Mitigation is not required for the No-Action Alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

CP1 consists of raising Shasta Dam by 6.5 feet, which would increase the surface water elevation and acreage of the inundation area. Under CP1, transportation facilities in the proposed inundation area would be relocated to sites outside that area. Transportation facilities include road infrastructure and vehicular bridges. Construction would involve installing bank fortification to preserve road segments and dike/abutment protection for bridge structures that do not require relocation. The construction period would be approximately 4.5 years. As shown in Table 20-2 and Figures 20-1c and 20-1f, the following transportation facilities would need to be relocated to accommodate construction under CP1:

- Four segments of Lakeshore Drive beginning in the Lakeshore area west of I-5, extending south to the Sugarloaf Area and along the Sugarloaf Creek Inlet. Shasta County owns and maintains the first segment extending from the Lakeshore area to the Sugarloaf area, the most populated areas around the lake. The Doney Creek and Charlie Creek bridges in this segment would also require relocation. USFS owns and maintains the segments that extend from the Sugarloaf area along Sugarloaf Creek Inlet. A total of 8,100 feet of Lakeshore Drive would require relocation. No segment of Lakeshore Drive would need to be closed during construction.

- Three road segments in the Turntable Bay area, northeast of the north end of the Pit River Bridge. These road segments are owned and maintained by USFS. The segments provide access to the Shasta Yacht Club. A total of 6,200 feet of roadway would require relocation. Given

the terrain along these segments, these roadways would need to be closed during construction.

- Silverthorn Road and segments of USFS roads in the Jones Valley area, on the south side of the Pit Arm of Shasta Lake. Owned and maintained by Shasta County, Silverthorn Road provides access to a residential area composed of permanent and seasonally occupied dwelling units. A total of 2,000 feet of roadway would be relocated. These roadways would need to be closed during construction.

- Additional road segments in the primary study area totaling 230 linear feet. None of these road segments would need to be closed during construction.

- Two railroad bridges with realignment of the railroad tracks between the bridges. Both of the bridges would require modification.

- Relocation of McCloud River Bridge and Didallas Creek Bridge. Modification of Pit River Bridge and Fenders Ferry Bridge.

Potential impacts on access roads to and internal loop roads at campsites and other recreation facilities are evaluated in Chapter 18, "Recreation and Public Access." Potential impacts from changes in Sacramento River flows due to water operations, that may affect transportation infrastructure (e.g. bridges), are described in Chapter 4, "Geology, Geomorphology, Minerals, and Soils" and Chapter 6, "Hydrology, Hydraulics, and Water Management."

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Trans-1 (CP1): Short-Term and Long-Term Increases in Traffic in the Primary Study Area in Relation to the Existing Traffic Load and Capacity of the Street System Construction activities would temporarily increase traffic. This short-term, temporary impact would be potentially significant. In the long term, increased recreational opportunities and visitor days would result in additional traffic on area roadways; however, the long-term impact would be less than significant.

Existing traffic in the primary study area is generated by residents living and working in the area, living in the area and working elsewhere, and living elsewhere and working in the area; and by tourists who come to visit the dam, picnic, hike, camp, fish, and go boating. Because Shasta Lake is a tourist destination, traffic is seasonally heavier from the middle of spring to the middle of fall (Reclamation 2004).

Project construction activities would require numerous truck trips to move materials to and from the project site, as well as trips in personal vehicles by construction crew members commuting to and from the site. Traffic would

temporarily increase on roadways in the primary study area including I-5, Shasta Dam Boulevard, Lake Boulevard, Lakeshore Drive, and other roads during the CP1 construction period. Commute trips by construction workers would add vehicles to the road system during the a.m. and p.m. peak periods. Haul truck trips would increase traffic on designated haul routes during peak and off-peak hours.

Approximately 95 round-trip haul trips per day are anticipated for trucking materials to the dam site over a 4.5-year construction period. Approximately 75 round trips per day are anticipated for trucking materials cleared from the land over the same period. The total number of truck trips, 170 round trips per day, would not exceed the ITE threshold of 50 new truck trips in the a.m. and p.m. peak hours (i.e., 7–9 a.m. and 4–6 p.m.) because the truck trips would be distributed over an 8-hour workday; approximately 21 truck trips would occur during the peak-hour period. This impact would be less than significant.

Up to 300 round trips per day by workers are anticipated. Because various construction activities would occur concurrently, these truck trips would be distributed to multiple locations within the primary study area. However, the total number of worker trips may temporarily exceed the existing traffic loads and capacities on the roads where substantial numbers of workers are located at any one time. This impact would be potentially significant.

Traffic slowdowns may also result from temporary obstruction of roadway access because of lane closures or heavy equipment entering and exiting the road. Most construction would be phased to maintain access to existing roadways and bridges while constructing the relocated roadways and bridges; however, some construction would require lane closures. There would also likely be temporary traffic controls for transport of large material loads to and from the demolition, modification, and relocation sites. Lane closures and traffic slowdowns could occur on a number of roadways and bridges, and circulation patterns would change if detours were to be required during replacement of transportation facilities. Detours may add traffic that could exceed the capacity of the facility being relocated. This impact would be potentially significant.

In the long term, increased recreational opportunities and visitors would increase traffic on area roads by an estimated average of 158 one-way trips per day. These additional trips would be distributed throughout the primary study area to numerous recreational facilities: 6 public boat ramps, 9 commercial marinas, 15 family campgrounds, and various other public and private facilities. These recreational facilities are distributed around Shasta Lake and can be accessed via numerous roadways. Because these trips would be distributed over a large number of roadways throughout a large area, the additional trips are not expected to exceed the existing traffic loads and capacities of the street system. Growth in the primary study area that is generated through implementation of city and county general plans would increase traffic in the area. The regional

transportation planning documents identify roadway projects needed to accommodate expected traffic increases. Therefore, the long-term impact of traffic increases on area roads would be less than significant.

In summary, in the short term, construction activities under CP1 are expected to result in a potentially significant impact on traffic; but in the long term, the impact of traffic increases resulting from expected growth and additional recreational opportunities would be less than significant. Mitigation for this short-term impact is proposed in Section 20.3.5.

Impact Trans-2 (CP1): Adverse Effects on Access to Local Streets and Adjacent Uses in the Primary Study Area Relocation of transportation facilities would require either road closures and detours or partial road closures, or a combination of both. This temporary direct impact would be potentially significant. Indirect impacts on air quality, noise, and recreation resulting from extended travel lengths, increased traffic near sensitive land uses, and limiting or restricting access to recreational facilities are evaluated in the corresponding chapters of this DEIS.

CP1 would raise the elevation and increase the surface acreage of Shasta Lake. Several existing roads and bridges at the lake would require relocation to avoid potential inundation as the elevation of the lake's full pool increases.

It is anticipated that most of the new roadway alignments or bridges would be constructed and connected to existing road facilities before demolition of the existing facilities in the proposed inundation area. In some cases, work in the road relocation areas may require a road closure with detours, lane closures, or a combination of both. Road closures would temporarily impede access to local connector roads and recreational land uses, affecting residents, local recreational and nonrecreational businesses, and visitors to Shasta Lake. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Detours and alternate routes resulting from road and bridge relocations could cause longer trip lengths and increase traffic in areas of sensitive land uses. The following potential indirect impacts are evaluated in the corresponding chapters of this DEIS:

- Effects on air quality caused by extended trip lengths – Chapter 5, "Air Quality and Climate"
- Effects on sensitive receptors resulting from increased traffic on connector roads caused by detours – Chapter 8, "Noise and Vibration"
- Effects on recreation caused by restrictions to facility access – Chapter 18, "Recreation and Public Access"

Impact Trans-3 (CP1): Hazards in the Primary Study Area Caused by a Design Feature Relocated road segments and vehicular and railroad bridges would be designed to current engineering design standards. This impact would be beneficial.

Road segments, vehicular bridges, and railroad bridges must be designed to current engineering and seismic standards. Current engineering standards ensure that hazards are minimized to the extent practicable. Modernizing bridges to current design standards is a beneficial aspect of CP1. Because relocated road segments and vehicular bridges would be designed to current engineering design standards, design features would not increase hazards but would actually decrease the potential for hazards. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Trans-4 (CP1): Adverse Effects on Emergency Access in the Primary Study Area during Construction Road closures may result in increased response times for emergency vehicles. This direct impact would be potentially significant. Indirect impacts on air quality resulting from extended driving lengths, increased emergency vehicle response times, and potential noise impacts on sensitive receptors are discussed in the respective chapters of this DEIS.

As discussed under Impact Trans-2 (CP1), temporary road closures and lane closures would be needed for construction of the relocated road alignments and bridges. Several schools are located near roadways that would be affected by construction, and it is expected that school bus routes could be affected by temporary road closures. Although no emergency response centers are in the immediate area affected by construction, road and lane closures may restrict emergency vehicle access. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

The following potential indirect impacts are evaluated in the corresponding chapters of this DEIS:

- Effects on air quality caused by extended trip lengths – Chapter 5, “Air Quality and Climate”
- Effects on sensitive receptors – Chapter 8, “Noise and Vibration”
- Effects of increased emergency vehicle response times – Chapter 22, “Public Services”

Impact Trans-5 (CP1): Accelerated Degradation of Surface Transportation Facilities in the Primary Study Area during Construction Trucks used to import fill material and export construction waste would accelerate degradation of surface transportation facilities used as haul routes. This impact would be potentially significant.

As noted in the discussion of Impact Trans-1 (CP1), CP1 would generate approximately 170 round trips per day for the length of the 4.5-year construction period. Degradation of road surfaces would result in a significant impact if truck trips associated with the project would substantially shorten the life of the facility so that the owner of the right-of-way would need to repair or rehabilitate the road surface before it is scheduled for repair. The significance determination is based on several factors, including the existing condition of road surfaces and the road's normal repair or rehabilitation schedule. Given the total number of anticipated trips and expected weight of the payloads, the impact of CP1 on existing road surfaces in relation to the anticipated utility of the road surfaces would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas No effects on traffic or transportation are expected to occur in the lower Sacramento River and Delta or in the CVP/SWP service areas; therefore, potential effects in those geographic regions are not discussed further in this DEIS.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

CP2 consists of raising Shasta Dam by 12.5 feet, which would result in a greater increase in the surface water elevation and acreage of inundation area than under CP1. A larger number of transportation facilities would be relocated under CP2 than under CP1. CP2 would have a 5-year construction period, compared to 4.5 years under CP1. As shown in Table 20-2 and Figures 20-1c, 20-1d, 20-1f, and 20-1g, the following transportation facilities would need to be relocated to accommodate construction under CP2:

- Two segments of Lakeshore Drive in addition to the 4 road segments that would be relocated under CP1, for a total of 6 segment relocations along Lakeshore Drive totaling 13,100 feet. As under CP1, no segment of Lakeshore Drive would need to be completely closed during construction.

- The same 3 road segments in the Turntable Bay area (with a total roadway length of 6,200 feet) that would require relocation under CP1. As under CP1, these roadways would need to be closed during construction.

- Three segments of Gillman Road that run along the west side of the McCloud Arm of Shasta Lake, totaling 1,200 feet. Owned and maintained by Shasta County, the road is used primarily by logging trucks. Gillman Road would need to be closed during construction.

- The same segments of Silverthorn Road and other USFS roads in the Jones Valley area that would require relocation under CP1 (with a total

roadway length of 2,000 feet). As under CP1, these roadways would need to be closed during construction.

- Four segments of Salt Creek Road that run along the west side of the Squaw Creek Arm of Shasta Lake, totaling 4,300 feet. Salt Creek Road is a dirt and gravel road owned and maintained by USFS. Its primary use is for USFS access. Didallas Creek Bridge crosses one of the segments and would also require relocation under CP2. Salt Creek Road would need to be closed during construction.

- An additional two road segments besides the two other road segments that would be relocated under CP1. The total length of the 4 roadway segments that would be relocated under CP2 is 2,300 feet. As under CP1, none of these road segments would need to be closed during construction.

- Two railroad bridges with realignment of the railroad tracks between the bridges. Both of the bridges would require modification.

- Relocation of McCloud River Bridge and Didallas Creek Bridge. Modification of Pit River Bridge and Fenders Ferry Bridge.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Trans-1 (CP2): Short-Term and Long-Term Increases in Traffic in the Primary Study Area in Relation to the Existing Traffic Load and Capacity of the Street System Construction activities would temporarily increase traffic. This short-term, temporary impact would be potentially significant. In the long term, increased recreational opportunities and visitor days would result in additional traffic on area roadways; however, the long-term impact would be less than significant.

This impact is similar to Impact Trans-1 (CP1), but the impact would be greater than under CP1, as described below.

Approximately 118 round-trip haul trips per day are anticipated for trucking materials to the dam site over a 5-year construction period. Approximately 56 round trips per day are anticipated for trucking materials cleared from the land over the same period. The total number of truck trips, 174 round trips per day, would not exceed the ITE threshold of 50 new truck trips because the trips would be distributed over an 8-hour workday; approximately 21 truck trips would occur in the a.m. and p.m. peak hours (i.e., 7–9 a.m. and 4–6 p.m.). This is the same number of daily truck trips as under CP1, but these trips would be borne on the transportation network for a longer duration than under CP1; therefore, the impact would be greater than under CP1. Because the ITE threshold would not be exceeded, this impact would be less than significant.

Up to 300 round trips per day by workers are anticipated over a 5-year period under CP2. Because various construction activities would occur concurrently, these truck trips would be distributed to multiple locations within the primary study area. However, the worker trips would occur over a longer construction period than under CP1; therefore, the impact would be greater than under CP1. This impact would be potentially significant.

As under CP1, traffic slowdowns also may result from temporary obstruction of roadway access because of lane closures or heavy equipment entering and exiting the road. Interference would occur over a longer period than under CP1; therefore, the impact would be greater than under CP1. This impact would be potentially significant.

In the long term, under CP2, traffic on roads within the primary study area would increase by an estimated average of 238 one-way trips per day, more than under CP1; however, for the same reasons as described in CP1, this impact would be less than significant.

In summary, in the short term, construction activities under CP2 are expected to result in a potentially significant impact on traffic that would be greater than under CP1; but in the long term, the impact of traffic increases resulting from expected growth and additional recreational opportunities would be less than significant. Mitigation for this short-term impact is proposed in Section 20.3.5.

Impact Trans-2 (CP2): Adverse Effects on Access to Local Streets and Adjacent Uses in the Primary Study Area Relocation of transportation facilities would require either road closures and detours or partial road closures, or a combination of both. This temporary direct impact would be potentially significant. Indirect impacts on air quality, noise, and recreation resulting from extended travel lengths, increased traffic near sensitive land uses, and limiting or restricting access to recreational facilities are evaluated in the corresponding chapters of this DEIS.

This impact would be similar to Impact Trans-2 (CP1); however, because CP2 would require that more roads be closed for a longer duration than under CP1, the impact would be greater than under CP1. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5. Potential indirect effects are evaluated in Chapter 5, “Air Quality and Climate”; Chapter 8, “Noise and Vibration”; and Chapter 18, “Recreation and Public Access.”

Impact Trans-3 (CP2): Hazards in the Primary Study Area Caused by a Design Feature Relocated road segments and vehicular and railroad bridges would be designed to current engineering design standards. This impact would be beneficial.

This impact would be similar to Impact Trans-3 (CP1); however, CP2 would result in a greater beneficial effect than CP1 because more bridges would be

replaced and constructed using current design standards under CP2 than under CP1. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Trans-4 (CP2): Adverse Effects on Emergency Access in the Primary Study Area during Construction Road closures may result in increased response times for emergency vehicles. This direct impact would be potentially significant. Indirect impacts on air quality resulting from extended driving lengths, increased emergency vehicle response times, and potential noise impacts on sensitive receptors are discussed in the respective chapters of this DEIS.

This impact would be similar to Impact Trans-4 (CP1). However, the construction period for CP2 would be 5 years, 6 months longer than the construction period for CP1. Because road closures under CP2 would occur for a longer period than under CP1, the impact would be greater under CP2 than under CP1. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5. Potential indirect effects are evaluated in Chapter 5, "Air Quality and Climate"; Chapter 8, "Noise and Vibration"; and Chapter 22, "Public Services."

Impact Trans-5 (CP2): Accelerated Degradation of Surface Transportation Facilities in the Primary Study Area Trucks used to import fill material and export construction waste would accelerate degradation of surface transportation facilities used as haul routes. This impact would be potentially significant.

This impact would be similar to Impact Trans-5 (CP1). As noted in the discussion of Impact Trans-1 (CP2), CP2 would generate approximately 174 round trips per day for the length of the 5-year construction period. This is similar to the number of round trips per day anticipated under CP1; however, because the construction period for CP2 would be longer than the construction period for CP1, the impact on road surfaces would be greater under CP2 than under CP1. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas No effects on traffic or transportation are expected to occur in the lower Sacramento River and Delta or in the CVP/SWP service areas; therefore, potential effects in those geographic regions are not discussed further in this DEIS.

CP3 – 18.5-Foot Dam Raise, Agricultural Water Supply Reliability and Anadromous Fish Survival

CP3 consists of raising Shasta Dam by 18.5 feet, which would result in a greater increase in the surface water elevation and acreage of inundation area than would occur under CP1 or CP2. A larger number of transportation facilities

would be relocated under CP3 than under CP1 and CP2. CP3 would have a 5-year construction period, compared to 4.5 years under CP1. As shown in Table 20-2 and Figures 20-1c, 20-1d, 20-1f, and 20-1g, the following transportation facilities would need to be relocated to accommodate construction under CP3:

- Two road segments of Lakeshore Drive in addition to the 6 road segments that would be relocated under CP2, for a total of 8 segment relocations along Lakeshore Drive totaling 13,700 feet. Doney Creek Bridge and Charlie Creek Bridge would be relocated. As under CP1 and CP2, no segment of Lakeshore Drive would need to be completely closed during construction.

- The same 3 segments in the Turntable Bay area (with a total roadway length of 6,200 feet) that would require relocation under CP1 and CP2. As under CP1 and CP2, these roadways would need to be closed during construction.

- The same three segments of Gillman Road that would require relocation under CP2. As under CP2, Gillman Road would need to be closed during construction.

- An additional three road segments of Silverthorn Road and/or other USFS roads in the Jones Valley area besides the segments that would require relocation under CP1 and CP2. The total length of roadway that would be relocated under CP3 is 3,600 feet. As under CP1 and CP2, these roadways would need to be closed during construction.

- An additional road segment of Salt Creek Road that runs along the west side of the Squaw Creek Arm of Shasta Lake, besides the four roadway segments that would be relocated under CP2. The total length of roadways that would be relocated under CP3 is 5,100 feet. As under CP2, Salt Creek Road would need to be closed during construction.

- Three additional road segments besides the four other road segments that would be relocated under CP1 and CP2. The total length of the 7 roadway segments that would be relocated under CP3 is 3,900 feet. As under CP1 and CP2, none of these road segments would need to be closed during construction.

- Two railroad bridges with realignment of the railroad tracks between the bridges. Both of the bridges would require modification.

- Relocation of McCloud River Bridge and Didallas Creek Bridge. Modification of Pit River Bridge and Fenders Ferry Bridge.

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Trans-1 (CP3): Short-Term and Long-Term Increases in Traffic in the Primary Study Area in Relation to the Existing Traffic Load and Capacity of the Street System Construction activities would temporarily increase traffic. This short-term, temporary impact would be potentially significant. In the long term, increased recreational opportunities and visitor days would result in additional traffic on area roadways; however, the long-term impact would be less than significant.

This impact would be similar to Impacts Trans-1 (CP1) and Trans-1 (CP2), but the impact would be greater than under CP1 or CP2, as described below.

Approximately 168 round-trip haul trips per day are anticipated for trucking materials to the dam site over a 5-year construction period. Approximately 52 round trips per day are anticipated for trucking materials cleared from the land over the same period. The total number of truck trips, 220 round trips per day, would not exceed the ITE threshold of 50 new truck trips because the trips would be distributed over an 8-hour workday; approximately 28 trips would occur during the a.m. and p.m. peak hours (i.e., 7–9 a.m. and 4–6 p.m.). This is a greater number of daily truck trips than under CP1 and CP2, and these daily truck trips would occur for a longer duration than under CP1; therefore, the impact would be greater under CP3 than under CP1 or CP2. Because the number of truck trips during the peak hours would not exceed the ITE threshold, this impact would be less than significant.

Up to 350 round trips per day by workers are anticipated over a 5-year period. Because various construction activities would occur concurrently, these truck trips would be distributed to multiple locations within the primary study area. However, the total number of worker trips may temporarily exceed the existing traffic loads and capacities on the roads where substantial numbers of workers are located at any one time. The number of worker trips would be greater than under CP1 and CP2 and would occur over a longer construction period than under CP1; therefore, the impact would be greater than under CP1 or CP2. This impact would be potentially significant.

As under CP1 and CP2, traffic slowdowns may also result from temporary obstruction of roadway access because of lane closures or heavy equipment entering and exiting the road. Interference would occur over a longer period than under CP1 or CP2; therefore, the impact would be greater than under CP1 or CP2. This impact would be potentially significant.

In the long term, under CP3, traffic on roads within the primary study area would increase by an estimated average of 364 one-way trips per day, more than under either CP1 or CP2; however, for the same reasons as described in CP1, this impact would be less than significant.

In summary, in the short term, construction activities under CP3 are expected to result in a potentially significant direct impact on traffic that would be greater than under CP1 or CP2; however, the impact of traffic increases resulting from expected growth and additional recreational opportunities would be less than significant. Mitigation for this short-term impact is proposed in Section 20.3.5.

Impact Trans-2 (CP3): Adverse Effects on Access to Local Streets and Adjacent Uses in the Primary Study Area Relocation of transportation facilities would require either road closures and detours or partial road closures, or a combination of both. This temporary direct impact would be potentially significant. Indirect impacts on air quality, noise, and recreation resulting from extended travel lengths, increased traffic near sensitive land uses, and limiting or restricting access to recreational facilities are evaluated in the corresponding chapters of this DEIS.

This impact would be similar to Impacts Trans-2 (CP1) and Trans-2 (CP2); however, because CP3 would require more roads to be closed for a longer duration than under CP1 and CP2, the impact would be greater than under CP1 or CP2. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5. Potential indirect effects are evaluated in Chapter 5, "Air Quality and Climate"; Chapter 8, "Noise and Vibration"; and Chapter 18, "Recreation and Public Access."

Impact Trans-3 (CP3): Hazards in the Primary Study Area Caused by a Design Feature Relocated road segments and vehicular and railroad bridges would be designed to current engineering design standards. This impact would be beneficial.

This impact would be similar to Impacts Trans-3 (CP1) and Trans-3 (CP2); however, CP3 would result in a greater beneficial effect than CP1 or CP2 because more bridges would be replaced and constructed using current design standards under CP3 than under CP1 or CP2. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Trans-4 (CP3): Adverse Effects on Emergency Access in the Primary Study Area during Construction Road closures may result in increased response times for emergency vehicles. This direct impact would be potentially significant. Indirect impacts on air quality resulting from extended driving lengths, increased emergency vehicle response times, and potential noise impacts on sensitive receptors are discussed in the respective chapters of this DEIS.

This impact would be the same as Impact Trans-4 (CP2). This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5. Potential indirect effects are evaluated in Chapter 5, "Air Quality and Climate;" Chapter 8, "Noise and Vibration;" and Chapter 22, "Public Services."

Impact Trans-5 (CP3): Accelerated Degradation of Surface Transportation Facilities in the Primary Study Area Trucks used to import fill material and export construction waste would accelerate degradation of surface transportation facilities used as haul routes. This impact would be potentially significant.

This impact would be similar to Impacts Trans-5 (CP1) and Trans-5 (CP2). As noted in the discussion of Impact Trans-1 (CP3), CP3 would generate approximately 220 round trips per day for the length of the 5-year construction period. This is greater than the number of round trips per day anticipated under CP1 and CP2. In addition, the construction period for CP3 would be longer than the construction period for CP1. Therefore, the impact on road surfaces would be greater under CP3 than under CP1 or CP2. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas No effects on traffic or transportation are expected to occur in the lower Sacramento and Delta area or in the CVP/SWP service areas; therefore, potential effects in those geographic regions are not discussed further in this DEIS.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus

CP4 consists of raising Shasta Dam by 18.5 feet. The same transportation facilities would be relocated under this alternative as under CP3. CP4 would also have an approximately 5-year construction period like CP3, compared to 4.5 years under CP1.

In addition to constructing the dam raise and relocating transportation facilities described for CP3, CP4 involves augmenting locations along the Sacramento River with gravel. As noted previously, gravel augmentation would be conducted at up to 3 of the identified sites annually for a 10-year period, commencing with construction of CP4. The following analysis evaluates, as the maximum-intensity option, gravel augmentation at the three sites located the farthest from Redding where gravel is known to be available from commercial sources. All other combinations of gravel augmentation sites would have lesser impacts than the combination of sites evaluated herein.

In addition to the dam construction, relocation of transportation facilities, and gravel augmentation, CP4 includes habitat and recreational resources improvements at up to six restoration sites. (See the description in Chapter 2, "Alternatives." The proposed improvements are shown in Figure 2-3.)

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Trans-1 (CP4): Short-Term and Long-Term Increases in Traffic in the Primary Study Area in Relation to the Existing Traffic Load and Capacity of the Street System Construction activities would temporarily increase traffic. This

short-term, temporary impact would be potentially significant. In the long term, increased recreational opportunities and visitor days would result in additional traffic on area roadways; however, the long-term impact would be less than significant.

This impact would be similar to but greater than Impacts Trans-1 (CP1), Trans-1 (CP2), and Trans-1 (CP3) because additional haul trips would be required for construction, gravel augmentation, and habitat restoration. Approximately 175 round-trip haul trips per day are anticipated for trucking materials to the dam site over a 5-year construction period. Approximately 53 round trips per day are anticipated for trucking materials cleared from the land over the same period. The total number of truck trips, 228 round trips per day, would not exceed the ITE threshold of 50 new truck trips because the trips would be distributed over an 8-hour workday. Approximately 29 trips would occur during the a.m. and p.m. peak hours (i.e., 7–9 a.m. and 4–6 p.m.). This is a greater number of daily truck trips than under CP1, CP2, and CP3 and these daily truck trips would occur for a longer duration than under CP1; therefore, the impact would be greater than under CP1, CP2, and CP3. Because the number of truck trips during the peak hours would not exceed the ITE threshold, this impact would be less than significant.

Using the Redding Riffle site as the maximum-intensity option in terms of haul truck trips affecting traffic for gravel augmentation, approximately 800 round trips would be made during the September and August construction term under CP4. This is based on placing 19,000 tons of gravel at the site and the capacity of the haul trucks being 25 tons per load. With a total of 44 8-hour workdays (2 months excluding weekends), the number of daily haul trips would be 18 haul trips per day. This would not exceed the ITE threshold of 50 new truck trips in the peak-hour period even if all of the truck trips occurred during the peak-hour period. Distributed over an 8-hour workday, two truck trips would occur during the a.m. peak-hour period and two truck trips would occur during the p.m. peak-hour period.

In addition to the haul trips for gravel augmentation, there would be haul trips for removing approximately 15,650 cubic yards of fill material from up to 6 restoration sites. Haul trucks can carry 14 cubic yards. Therefore, a total of approximately 1,118 haul trips would be required to remove the fill material. With a total of 44 8-hour workdays (2 months excluding weekends), the number of daily haul trips would be 25 haul trips per day. This would add approximately three truck trips in both the a.m. and p.m. peak-hour periods.

Combining the 3 truck trips during the peak-hour period resulting from removing the fill material from 1 or more of the restoration sites with gravel augmentation and the 18.5-foot Shasta Dam raise and related activities, approximately 37 peak-hour trips would occur. This is below the ITE threshold of 50 new truck trips during the a.m. and p.m. peak hours.

In the long term, under CP4, traffic on area roads would increase by an estimated average of 658 one-way trips per day. This is greater than under CP1, CP2, and CP3; however, for the same reasons as described in CP1, this impact would be less than significant.

In the short term, construction activities under CP4 are expected to result in a potentially significant impact on traffic; but in the long term, for the same reasons as described in CP1, the impact of traffic increases resulting from expected growth and additional recreational opportunities would be less than significant. Mitigation for this short-term impact is proposed in Section 20.3.5.

Impact Trans-2 (CP4): Adverse Effects on Access to Local Streets and Adjacent Uses in the Primary Study Area Relocation of transportation facilities would require either road closures and detours or partial road closures, or a combination of both. This temporary direct impact would be potentially significant. Indirect impacts on air quality, noise, and recreation resulting from extended travel lengths, increased traffic near sensitive land uses, and limiting or restricting access to recreational facilities are evaluated in the corresponding chapters of this DEIS.

This impact would be the same as Impacts Trans-2 (CP2) and Trans-2 (CP3) and similar to but greater than Impact Trans-2 (CP1) because the duration of project construction under CP4 would be longer than under CP1. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5. Potential indirect effects are evaluated in Chapter 5, “Air Quality and Climate”; Chapter 8, “Noise and Vibration”; and Chapter 18, “Recreation and Public Access.”

Impact Trans-3 (CP4): Hazards in the Primary Study Area Caused by a Design Feature Relocated road segments and vehicular and railroad bridges would be designed to current engineering design standards. This impact would be beneficial.

This impact would be the same as Impact Trans-3 (CP3) and similar to Impacts Trans-3 (CP1) and Trans-3 (CP2); however, like CP3, CP4 would result in a greater beneficial effect than CP1 and CP2 because more bridges would be replaced and constructed using current design standards under CP4 than under CP1 or CP2. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Trans-4 (CP4): Adverse Effects on Emergency Access in the Primary Study Area during Construction Road closures may result in increased response times for emergency vehicles. This direct impact would be potentially significant. Indirect impacts on air quality resulting from extended driving lengths, increased emergency vehicle response times, and potential noise impacts on sensitive receptors are discussed in the respective chapters of this DEIS.

This impact would be the same as Impacts Trans-4 (CP2) and Trans-4 (CP3) and similar to Impact Trans-4 (CP1). For the same reasons as described under Impacts Trans-4 (CP2) and Trans-4 (CP3), the impact would be greater under CP4 than under CP1, and this impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5. Potential indirect effects are evaluated in Chapter 5, "Air Quality and Climate"; Chapter 8, "Noise and Vibration"; and Chapter 22, "Public Services."

Impact Trans-5 (CP4): Accelerated Degradation of Surface Transportation Facilities in the Primary Study Area Trucks used to import fill material and export construction waste would accelerate degradation of surface transportation facilities used as haul routes. This impact would be potentially significant.

This impact would be similar to Impacts Trans-5 (CP1), Trans-5 (CP2), and Trans-5 (CP3), but would be greater because gravel augmentation would affect more roadways for a longer duration. For the same reasons as described under Impact Trans-5 (CP3), the impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas No effects on traffic or transportation are expected to occur in the lower Sacramento River and Delta or in the CVP/SWP service areas; therefore, potential effects in those geographic regions are not discussed further in this DEIS.

CP5 – 18.5-Foot Dam Raise, Combination Plan

CP5 consists of raising Shasta Dam by 18.5 feet. The same transportation facilities would be relocated under this alternative as under CP3 and CP4. CP5 would have an approximately 5-year construction period like CP2, CP3, and CP4, compared to 4.5 years under CP1.

Like CP4, CP5 involves augmenting locations along the Sacramento River with gravel. The assumptions stated for CP4 gravel augmentation are the same for CP5.

Also like CP4, in addition to the construction of the dam raise, relocation of transportation facilities, and gravel augmentation, CP5 includes habitat and recreational resources improvements at up to six downstream restoration areas. (See the description in Chapter 2, "Alternatives." The proposed improvements are shown in Figure 2-3.)

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff)

Impact Trans-1 (CP5): Short-Term and Long-Term Increases in Traffic in the Primary Study Area in Relation to the Existing Traffic Load and Capacity of the Street System Construction activities would temporarily increase traffic. This

short-term, temporary impact would be potentially significant. In the long term, increased recreational opportunities and visitor days would result in an additional 311 one-way trips on area roadways, similar to CP3; however, for the same reasons as described in CP1, the long-term impact would be less than significant.

This impact would be similar to but greater than Impacts Trans-1 (CP1), Trans-1 (CP2), Trans-1 (CP3), and Trans-1 (CP4) because very limited additional construction-related trips associated with enhancements to shoreline and tributary aquatic habitat and recreational trails would be needed and 10 more workers per year than under CP4. For the same reasons as described under Impact Trans-1 (CP3) and Trans-1 (CP4), the impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Impact Trans-2 (CP5): Adverse Effects on Access to Local Streets and Adjacent Uses in the Primary Study Area Relocation of transportation facilities would require either road closures and detours or partial road closures, or a combination of both. This temporary direct impact would be potentially significant. Indirect impacts on air quality, noise, and recreation resulting from extended travel lengths, increased traffic near sensitive land uses, and limiting or restricting access to recreational facilities are evaluated in the corresponding chapters of this DEIS.

This impact would be the same as Impacts Trans-2 (CP2), Trans-2 (CP3), and Trans-2 (CP4), but greater than Impact Trans-2 (CP1) because the duration of project construction would be longer. This impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5. Potential indirect effects are evaluated in Chapter 5, “Air Quality and Climate”; Chapter 8, “Noise and Vibration”; and Chapter 18, “Recreation and Public Access.”

Impact Trans-3 (CP5): Hazards in the Primary Study Area Caused by a Design Feature Relocated road segments and vehicular and railroad bridges would be designed to current engineering design standards. This impact would be beneficial.

This impact would be the same as Impacts Trans-3 (CP3) and Trans-3 (CP4) and similar to Impacts Trans-3 (CP1) and Trans-3 (CP2); however, like CP3 and CP4, CP5 would result in a greater beneficial effect than CP1 and CP2 because more bridges would be replaced and constructed using current design standards under CP5 than under CP1 or CP2. This impact would be beneficial. Mitigation for this impact is not needed, and thus not proposed.

Impact Trans-4 (CP5): Adverse Effects on Emergency Access in the Primary Study Area during Construction Road closures may result in increased response times for emergency vehicles. This direct impact would be potentially significant. Indirect impacts on air quality resulting from extended driving lengths, increased emergency vehicle response times, and potential noise

impacts on sensitive receptors are discussed in the respective chapters of this DEIS.

This impact would be the same as Impacts Trans-4 (CP2), Trans-4 (CP3), and Trans-4 (CP4) and similar to Impact Trans-4 (CP1). For the same reasons as described under Impact Trans-4 (CP2), the impact would be greater under CP5 than under CP1 and would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Impact Trans-5 (CP5): Accelerated Degradation of Surface Transportation Facilities in the Primary Study Area Trucks used to import fill material and export construction waste would accelerate degradation of surface transportation facilities used as haul routes. This impact would be potentially significant.

This impact would be similar to Impact Trans-5 (CP4) and greater than Impacts Trans-5 (CP1), Trans-5 (CP2), and Trans-5 (CP3) because gravel augmentation would affect more roadways for a longer duration. For the same reasons as described under Impact Trans-5 (CP4), this impact would be potentially significant. Mitigation for this impact is proposed in Section 20.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas No effects on traffic or transportation are expected to occur in the lower Sacramento River and Delta or the CVP/SWP service areas; therefore, potential effects in those geographic regions are not discussed further in this DEIS.

20.3.5 Mitigation Measures

Table 20-3 presents a summary of mitigation measures for potentially significant and significant effects on transportation and traffic.

No-Action Alternative

No mitigation measures are required for this alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is required for Impact Trans-3 (CP1). Mitigation is provided below for the remaining impacts of CP1 on traffic and transportation.

Table 20-3. Summary of Mitigation Measures for Transportation and Traffic

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Trans-1: Short-Term and Long-Term Increases in Traffic in the Primary Study Area in Relation to the Existing Traffic Load and Capacity of the Street System	LOS before Mitigation	LTS	PS (short term), LTS (long term)	PS (short term), LTS (long term)	PS (short term), LTS (long term)	PS (short term), LTS (long term)	PS (short term), LTS (long term)
	Mitigation Measure	None required.	Mitigation Measure Trans-1: Prepare and Implement a Traffic Control and Safety Assurance Plan				
	LOS after Mitigation	LTS	LTS	LTS	LTS	LTS	LTS
Impact Trans-2: Adverse Effects on Access to Local Streets or Adjacent Uses in the Primary Study Area	LOS before Mitigation	LTS	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	Mitigation Measure Trans-2: To Reduce Effects on Local Access, Implement Mitigation Measure Trans-1: Prepare and Implement a Traffic Control and Safety Assurance Plan				
	LOS after Mitigation	LTS	LTS	LTS	LTS	LTS	LTS
Impact Trans-3: Hazards in the Primary Study Area Caused by a Design Feature	LOS before Mitigation	LTS	B	B	B	B	B
	Mitigation Measure	None required.	None needed; thus, none proposed				
	LOS after Mitigation	LTS	B	B	B	B	B
Impact Trans-4: Adverse Effects on Emergency Access in the Primary Study Area	LOS before Mitigation	LTS	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	Mitigation Measure Trans-4: To Reduce Effects on Emergency Access, Implement Mitigation Measure Trans-1: Prepare and Implement a Traffic Control and Safety Assurance Plan				
	LOS after Mitigation	LTS	LTS	LTS	LTS	LTS	LTS

Table 20-3. Summary of Mitigation Measures for Transportation and Traffic (contd.)

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Trans-5: Accelerated Degradation of Surface Transportation Facilities in the Primary Study Area	LOS before Mitigation	LTS	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	Mitigation Measure Trans-5: Identify and Repair Roadway Segments Damaged by the Project.				
	LOS after Mitigation	LTS	LTS	LTS	LTS	LTS	LTS
Impact Trans-6 (No-Action only): Temporary Increase in Traffic in the Extended Study Area in Relation to the Existing Traffic Load and Capacity of the Street System	LOS before Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
Impact Trans-7 (No-Action only): Adverse Effects on Access to Local Streets or Adjacent Uses in the Extended Study Area	LOS before Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
Impact Trans-8 (No-Action only): Hazards in the Extended Study Area Caused by a Design Feature	LOS before Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
Impact Trans-9 (No-Action only): Adverse Effects on Emergency Access in the Extended Study Area	LOS before Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	LTS	N/A	N/A	N/A	N/A	N/A

Table 20-3. Summary of Mitigation Measures for Transportation and Traffic (contd.)

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact Trans-10 (No-Action only): Accelerated Degradation of Surface Transportation Facilities in the Extended Study Area	LOS before Mitigation	LTS	N/A	N/A	N/A	N/A	N/A
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	LTS	N/A	N/A	N/A	N/A	N/A

Key:
B = beneficial
LOS = level of significance
LTS = less than significant
N/A = not applicable
PS = potentially significant

Mitigation Measure Trans-1 (CP1): Prepare and Implement a Traffic Control and Safety Assurance Plan Before construction starts, Reclamation and its primary contractors for engineering and construction will develop a coordinated construction traffic control plan to minimize the simultaneous use of roadways by different construction contractors for worker commute trips, material hauling, and equipment delivery to the extent feasible. The plan will outline phasing of activities and the use of multiple routes to and from off-site locations to minimize the daily amount of traffic on individual roadways. Reclamation will require that the construction contractors implement and enforce the plans throughout the construction periods. In addition, the plan will include the following elements:

- To the extent feasible, require construction contractors to limit truck trips to less than 50 trips per hour on any affected roadway during the morning and afternoon or evening peak-hour periods.

- To the extent feasible, limit the construction work zone to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone.

- Provide flagger control at construction zones to manage traffic control and flows as necessary.

- Install temporary steel-plate trench crossings, as needed, to maintain reasonable traffic, bicycle, and pedestrian access to homes, businesses, and streets.

- Maintain access for emergency vehicles at all times. Provide advance notification to local law enforcement, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on local roadways.

- Post advance warning of construction activities (for any affected roadways that would be closed or major roadways where lane closures would occur) in the local newspaper(s) and/or coordinate with the local jurisdictions to post such warnings in highly visible locations near the affected roadways.

- Post advance warnings about the potential presence of slow-moving vehicles in construction zones, where needed to reduce potential traffic hazards.

- Place and maintain barriers and install traffic control devices necessary for safety, as specified in Caltrans's *Manual of Traffic Controls for Construction and Maintenance Work Zones* and in accordance with the guidance provided by the affected local jurisdictions.

- Limit the accumulation of project-generated mud or dirt on roadways adjacent to construction areas. The construction contractor will sweep the affected paved roadways (water sweeper with reclaimed water recommended) at the end of each day if substantial volumes of soil material have been carried onto adjacent paved, public roads from construction sites.

- Train construction personnel in appropriate safety measures as described in the plan.

Reclamation will also inform the community at a public hearing about the potential traffic delays and the preparation of the traffic control plan.

Implementation of this mitigation measure would reduce Impact Trans-1 (CP1) to a less-than-significant level.

Mitigation Measure Trans-2 (CP1): To Reduce Effects on Local Access, Implement Mitigation Measure Trans-1 (CP1) Reclamation will implement Mitigation Measure Trans-1 (CP1) as described above to reduce adverse effects of road closures and detours or partial road closures on access to local streets and adjacent uses.

Implementation of this mitigation measure would reduce Impact Trans-2 (CP1) to a less-than-significant level.

Mitigation Measure Trans-4 (CP1): To Reduce Effects on Emergency Access, Implement Mitigation Measure Trans-1 (CP1) Reclamation will implement Mitigation Measure Trans-1 (CP1) as described above to reduce adverse effects of road closures on access by emergency vehicles.

Implementation of this mitigation measure would reduce Impact Trans-4 (CP1) to a less-than-significant level.

Mitigation Measure Trans-5 (CP1): Identify and Repair Roadway Segments Damaged by the Project The performance standard is to return roadway segments damaged by the project to pre-project conditions. The following measures will be implemented to require that Reclamation provides compensation for the repair of roadways that are degraded as a result of hauling:

- The contractor(s) responsible to Reclamation for delivery of borrow material shall identify all proposed haul routes on a map. The map will identify the owner of the rights-of-way (ROW) that are proposed for use as haul routes.

- The contractor(s) shall notify the owner of the ROW in writing and request conditional approval to use the ROW as a haul route. The contractor(s) shall submit a copy of the written request to Reclamation for Reclamation's file.

- The contractor(s) shall implement the conditions of approval for use of the haul route ROW. Conditions may include constructing repairs to damaged lengths of roadway or the payment of fees to compensate for roadway wear resulting from truck trips. Before commencement of hauling activities, the contractor(s) shall submit a copy of the ROW owner's conditional approval to Reclamation for Reclamation's file.

- Within 90 days after hauling activities are completed (that is the haul route is no longer in use for the project term), the contractor(s) shall submit a project close-out report to Reclamation to document compliance with the conditions of approval. Reclamation will keep the project close-out report on file.

Implementation of this mitigation measure would reduce Impact Trans-5 (CP1) to a less-than-significant level.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is required for Impact Trans-3 (CP2). Mitigation is provided below for the remaining impacts of CP2 on traffic and transportation.

Mitigation Measure Trans-1 (CP2): Prepare and Implement a Traffic Control and Safety Assurance Plan This mitigation measure is identical to Mitigation Measure Trans-1 (CP1). Implementation of this mitigation measure would reduce Impact Trans-1 (CP2) to a less-than-significant level.

Mitigation Measure Trans-2 (CP2): To Reduce Effects on Local Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-2 (CP1). Implementation of this mitigation measure would reduce Impact Trans-2 (CP2) to a less-than-significant level.

Mitigation Measure Trans-4 (CP2): To Reduce Effects on Emergency Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-4 (CP1). Implementation of this mitigation measure would reduce Impact Trans-4 (CP2) to a less-than-significant level.

Mitigation Measure Trans-5 (CP2): Identify and Repair Roadway Segments Damaged by the Project This mitigation measure is identical to Mitigation Measure Trans-5 (CP1). Implementation of this mitigation measure would reduce Impact Trans-5 (CP2) to a less-than-significant level.

CP3 – 18.5-Foot Dam Raise, Agricultural Water Supply Reliability and Anadromous Fish Survival

No mitigation is required for Impact Trans-3 (CP3). Mitigation is provided below for the remaining impacts of CP3 on traffic and transportation.

Mitigation Measure Trans-1 (CP3): Prepare and Implement a Traffic Control and Safety Assurance Plan This mitigation measure is identical to Mitigation Measure Trans-1 (CP1). Implementation of this mitigation measure would reduce Impact Trans-1 (CP3) to a less-than-significant level.

Mitigation Measure Trans-2 (CP3): To Reduce Effects on Local Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-2 (CP1). Implementation of this mitigation measure would reduce Impact Trans-2 (CP3) to a less-than-significant level.

Mitigation Measure Trans-4 (CP3): To Reduce Effects on Emergency Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-4 (CP1). Implementation of this mitigation measure would reduce Impact Trans-4 (CP3) to a less-than-significant level.

Mitigation Measure Trans-5 (CP3): Identify and Repair Roadway Segments Damaged by the Project This mitigation measure is identical to Mitigation Measure Trans-5 (CP1). Implementation of this mitigation measure would reduce Impact Trans-5 (CP3) to a less-than-significant level.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus

No mitigation is required for Impact Trans-3 (CP4). Mitigation is provided below for the remaining impacts of CP4 on traffic and transportation.

Mitigation Measure Trans-1 (CP4): Prepare and Implement a Traffic Control and Safety Assurance Plan This mitigation measure is identical to Mitigation Measure Trans-1 (CP1). Implementation of this mitigation measure would reduce Impact Trans-1 (CP4) to a less-than-significant level.

Mitigation Measure Trans-2 (CP4): To Reduce Effects on Local Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-2 (CP1). Implementation of this mitigation measure would reduce Impact Trans-2 (CP4) to a less-than-significant level.

Mitigation Measure Trans-4 (CP4): To Reduce Effects on Emergency Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-4 (CP1). Implementation of this mitigation measure would reduce Impact Trans-4 (CP4) to a less-than-significant level.

Mitigation Measure Trans-5 (CP4): Identify and Repair Roadway Segments Damaged by the Project This mitigation measure is identical to Mitigation Measure Trans-5 (CP1). Implementation of this mitigation measure would reduce Impact Trans-5 (CP4) to a less-than-significant level.

CP5 – 18.5-Foot Dam Raise, Combination Plan

No mitigation is required for Impact Trans-3 (CP5). Mitigation is provided below for the remaining impacts of CP5 on traffic and transportation.

Mitigation Measure Trans-1 (CP5): Prepare and Implement a Traffic Control and Safety Assurance Plan This mitigation measure is identical to Mitigation Measure Trans-1 (CP1). Implementation of this mitigation measure would reduce Impact Trans-1 (CP5) to a less-than-significant level.

Mitigation Measure Trans-2 (CP5): To Reduce Effects on Local Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-2 (CP1). Implementation of this mitigation measure would reduce Impact Trans-2 (CP5) to a less-than-significant level.

Mitigation Measure Trans-4 (CP5): To Reduce Effects on Emergency Access, Implement Mitigation Measure Trans-1 (CP1) This mitigation measure is identical to Mitigation Measure Trans-4 (CP1). Implementation of this mitigation measure would reduce Impact Trans-4 (CP5) to a less-than-significant level.

Mitigation Measure Trans-5 (CP5): Identify and Repair Roadway Segments Damaged by the Project This mitigation measure is identical to Mitigation Measure Trans-5 (CP1). Implementation of this mitigation measure would reduce Impact Trans-5 (CP5) to a less-than-significant level.

20.3.6 Cumulative Effects

The majority of the past, present, and reasonably foreseeable projects are related to the SLWRI through operations of Shasta Dam. The projects in the extended study area are not evaluated further because construction of the SLWRI would not affect transportation facilities in the extended study area. Projects that could influence the local transportation network affected by the SLWRI include implementation of the *Shasta-Trinity National Forest Land and Resource Management Plan, Iron Mountain Mine Restoration Plan, and Mendocino National Forest Land and Resource Management Plan*; and construction of the Antlers Bridge Replacement. The geographic scope of the management plans is vast while the geographic scope of the Antlers Bridge Replacement is relatively limited. Individually and combined, none of these projects would result in significant haul trips that would occur during the peak-hour period. The ITE threshold of 50 trips during the peak-hour period on any particular route is not expected because the actions would be distributed throughout a substantially large study area compared to the area affected by the SLWRI. Another reason that the ITE threshold would not be exceeded is that the forest and mine management and restoration actions would take place over a long period and the Antlers Bridge Replacement would be completed in 2014. Consequently, no significant cumulative adverse effect on transportation or traffic presently exists or would exist under the No-Action Alternative in the primary study area.

Potential impacts of the project alternatives (CP1–CP5) are related to construction activities and increased vehicle trips resulting from increased recreational opportunities at Shasta Lake and its tributaries. Construction impacts would be temporary and short term, and recreational vehicle trips would be permanent and long term.

For the following reasons, implementation of any of the project alternatives (CP1–CP5), when combined with construction traffic for present and reasonably foreseeable actions, would not result in a cumulatively considerable incremental contribution to a significant cumulative adverse effect on localized traffic and circulation. Under CP5, the maximum-intensity alternative, approximately 12 truck trips would be added to the a.m. and p.m. peak hours. These truck trips would not occur simultaneously on the haul routes. They would be distributed throughout the shoreline region of the lake, gravel augmentation sites (the sites that would change annually), and up to six restoration sites on the Sacramento River. The truck trips for the gravel augmentation and restoration activities would occur during a 2-month period, while the eight peak-hour trips upstream from Shasta Dam would occur over a much longer portion of the construction year. To result in a significant cumulative adverse effect on traffic and circulation, the present reasonably foreseeable future projects would need to generate 38 trips during the a.m. or p.m. peak hour. Because of the large geographic scope and length of time for implementing the present and reasonably foreseeable future projects, it is reasonable that they would not generate peak-hour truck trips that would be 68 percent more than the peak-hour truck trips that would be generated by CP5. Furthermore, the cumulative peak-hour truck trips would not be concentrated at any one road segment or intersection.

For the reasons set forth for adverse effects of construction traffic on localized traffic and circulation problems, construction traffic under any of the project alternatives (CP1–CP5) would not result in a cumulatively considerable incremental contribution to a significant cumulative adverse effect on emergency access.

For potential accelerated degradation of roadways from construction traffic, none of the construction alternatives (CP1–CP5) would result in cumulatively adverse effects. The reason is that the mitigation measure for these alternatives requires physical repair of damaged roadways to pre-project conditions, thereby eliminating the adverse effects of the alternatives. Implementation of Mitigation Measure Trans-5 (CP1) would ensure that the roadways would be equal to or in better condition than under preproject conditions. In addition, roads and bridges that would be relocated under any of the project alternatives would be modernized using current design standards and would likely be replaced before they were scheduled for replacement by the local transportation agencies.

In conclusion, with implementation of any of the project alternatives (CP1–CP5), no significant cumulative adverse effects would occur on traffic and circulation, emergency access, or transportation facilities.

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