

3.22 Traffic and Transportation

This section describes how the Proposed Action and alternatives could affect the area's transportation and circulation. This section includes a description of the area of analysis, the local and direct access routes identified to be used during construction, the existing non-motorized transportation network, and transit resources. This section also contains an analysis of future traffic volumes resulting from each alternative and describes mitigation measures to reduce impacts during construction. Appendix S includes tables that support this transportation and circulation analysis, and Appendix T describes 2020 Traffic Volume Projections.

3.22.1 Area of Analysis

The area of analysis for the Klamath Hydroelectric Settlement Agreement (KHSA) includes roadways in Siskiyou County in California and Klamath and Jackson Counties in Oregon. The area of analysis for the KHSA is rural with very low-density development. Most of the private property is undeveloped and/or used as grazing land for cattle with the exception of several small communities in the vicinity of Copco 1 and Iron Gate Reservoirs. Figure 3.22-1 depicts the transportation network in the area of analysis for the KHSA. The area of analysis for the Klamath Basin Restoration Agreement (KBRA) constitutes the entirety of the Klamath Basin and can be characterized as both urban and agricultural.

Table 3.22-1 lists the dam sites within the KHSA along with the corresponding regional and local roads that access each site.

3.22.2 Regulatory Framework

This analysis uses Oregon Department of Transportation (ODOT) and California Department of Transportation (Caltrans) accepted methods for measuring impacts on roadways. The Lead Agencies used these guidelines in the absence of county level guidelines. Caltrans measures traffic capacities in terms of a Level of Service (LOS). In California, the Siskiyou County General Plan is used as a guide in determining significance (1988). The ODOT system of congestion measurement is different from the LOS system that Siskiyou County and Caltrans use. The ODOT, Klamath County, and Jackson County, use a volume-to-capacity (v/c) ratio.

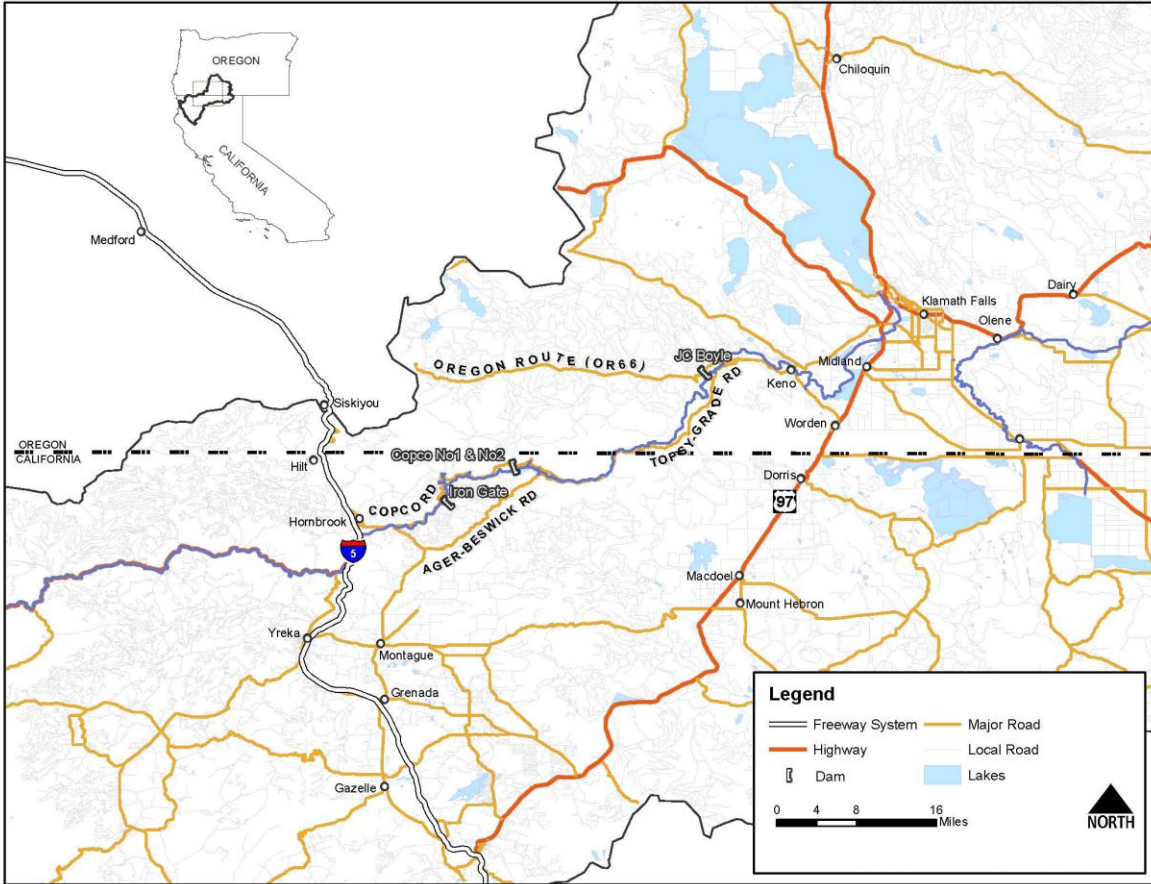


Figure 3.22-1. Regional Access Routes Relative to the KHS

Table 3.22-1. Local and Regional Access Roads Relative to KHS

Dam Site	Interstate Access Road	Regional Access Road	Local Access Road
J.C. Boyle	Interstate 5 (in Oregon) and US97	Oregon Route 66	Topsy Grade Road
Copco 1	Interstate 5 (in California)	Copco Road	Ager-Beswick Road
Copco 2	Interstate 5 (in California)	Copco Road	Ager-Beswick Road
Iron Gate	Interstate 5 (in California)	Copco Road	Lakeview Road

Source: CDM field observation, Oct 2010.

Where roadway planning level capacities were desired, and were not available from ODOT, Caltrans or County sources, the Lead Agencies used Caltrans accepted guidelines developed by the Florida Department of Transportation (FDOT) to outline roadway planning capacities in the project area.

3.22.2.1 Significance Criteria

For the purposes of the Klamath Facilities Removal Environmental Impact Statement/ Environmental Impact Report (EIS/EIR), effects would be significant if they resulted in the following conditions or situations:

- An alternative conflicted with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.¹ (Traffic Flow Effects)
- Non-compliance with county planning regulations. (Traffic Flow Effects)
- Traffic related to implementation of the alternative resulted in a LOS worse than level C in Siskiyou County.² (Traffic Flow Effects)
- Traffic related to implementation of the alternative resulted in a v/c ratio of more than 0.75 for OR66 or 0.70 for US97.³ (Traffic Flow Effects)
- Traffic related to implementation of the alternative traversed blind corners or sharp turns; if large trucks would be turning onto and off of roadways with high speed limits; and/or if conflicts would occur at existing recreation sites where passenger cars may consistently turn in and out. (Traffic Safety Effects)
- An alternative conflicted with adopted policies, plans, or programs regarding public transit. (Public Transit Effects)
- Project-related vehicle volumes were great enough to exceed the capacity of a road in the area of analysis. This would slow or impede general vehicle traffic along a roadway and delay public transit service. Effects would also be significant if construction activities were adjacent to public transit passenger pick up/drop off facilities and inhibited vehicle travel or transit vehicle turning movements. (Traffic Flow Effects)
- An alternative resulted in the following Non-Motorized Transportation Effects:
 - Substantial degradation of road conditions that interfered with non-motorized vehicle use.
 - Conflict with adopted policies, plans, or programs regarding bicycle or pedestrian facilities.
 - Deconstruction or construction traffic crossing or running along existing non-motorized transportation facilities.

¹ Taking into account all modes of transportation including mass transit and non-motorized 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.

² In California, progressively worsening traffic conditions are given the letter grades “A” through “F.” While most motorists consider an “A,” “B,” or “C” LOS as satisfactory, LOS “D” is considered marginally acceptable. Congestion and delay are considered unacceptable to most motorists; these conditions would result in LOS “E” or “F” ratings. LOS analyses can be very detailed but for the purposes of this analysis LOS will only be discussed when referring to industry-accepted general planning standards for roadway capacity. LOS C is the threshold for capacity for California roads in this analysis. According to the Siskiyou County General Plan, LOS worse than level C is not acceptable (Siskiyou County 1988).

³ In Oregon, several different thresholds apply to various roads. A v/c ratio of 1.0 is equivalent to a poor LOS (E or F) with long delays. Klamath and Jackson Counties and ODOT are willing to accept a certain amount of congestion during peak periods to encourage drivers to find other modes of transportation or other times to travel. Jackson County requires that I-5 have a v/c ratio no higher than 0.85 (Jackson County 2005). Klamath County requires that OR66 have a v/c ratio no greater than 0.75 and US97 have a v/c ratio of no greater than 0.70 (Klamath County 2004).

- A need for the narrowing or rerouting of non-motorized transportation infrastructure such as a bicycle lane or sidewalk.

3.22.3 Existing Conditions/Affected Environment

3.22.3.1 KHSA – River Reach Road Network

The following describes the characteristics of the roadways within the KHSA transportation analysis area. The Lead Agencies recorded these characteristics during site visits and collected existing traffic volume data for the subject roadways from three sources: ODOT, Caltrans, and field observations.

- **Interstate 5 (I-5)** – a major north/south interstate highway that runs the length of California and continues through Oregon. This is a main regional access road for the Four Facilities on the Klamath River. Through Siskiyou and Jackson Counties, I-5 has four lanes. The posted speed limit is 70 miles per hour (mph) in California and 65 mph in Oregon. The portion of I-5 in California closest to the Iron Gate Dam has more than 17,000 vehicles per day in Annual Average Daily Traffic (AADT) in its peak month, and averages 15,200 AADT. In Oregon, near the intersection with OR66, traffic volumes are closer to 14,300 AADT.
- **Oregon Route 66 (OR66)** – Known locally as Green Springs Highway, this road also carries the ODOT designation of Highway Number 21. OR66 is a two lane, east/west, asphalt state highway. It is approximately 32 feet wide and the posted speed limit is 55 mph in some locations. Some sharp curves on OR66 require posted speed reductions. OR66 connects I-5 to the J.C. Boyle Dam and to US Highway 97 (US97) and intersects I-5 approximately 14 miles north of the California border. Traffic counts from 2009 along OR66 show 9,500 AADT just east of I-5 and 500 AADT closest to the J.C. Boyle Dam.
- **US97** – Known locally as the California-Dalles Highway, this road carries the ODOT designation of Highway Number 4 and is a four lane, north/south, asphalt US highway. A barrier divides the northbound and southbound lanes and it has a wide shoulder. The posted speed limit is 65 mph and AADT in 2009 was 9,700 vehicles.
- **Copco Road** – a minor collector that leads from I-5 to the Iron Gate, Copco 1 and Copco 2 Dams. Copco Road is a paved, two-lane road in good pavement condition with few pavement cracks or ruts and is approximately 27 feet wide. Copco Road maintains this character from its intersection with I-5 east to a point about 10 miles from the Copco Developments near the Juniper Point Picnic Area. The section between the intersection of Copco Road with Ager Road and the Juniper Point Picnic Area, contains intermittent pavement surfacing that has not been as well maintained as the portions to the west of Ager Road. The final 3 miles, from Camp Creek Road near the Juniper Point Picnic Area to the Copco Dams, are gravel and narrow, and less than 18 feet wide in some locations. The

posted speed limit on Copco Road from I-5 to the Juniper Point Picnic Area is generally 55 mph with a few sharp curves, especially in the portions that run along the Iron Gate Reservoir. AADT for this analysis is based on field observation. See Figure 3.22-2 for a photo of a portion of Copco Road.



Source: CDM 2010

Figure 3.22-2. Copco Road (north of river, facing west)

- **Topsy Grade Road/Ager-Beswick Road** – This road is known as Topsy Grade Road in Oregon and Ager-Beswick Road in California. It runs along the southern side of the Klamath River and while it is the most direct route from the Copco 1 Reservoir to the J.C. Boyle Dam, between those two locations the road is mostly unimproved, natural surfacing. While this road has several different surfacing and sizing characteristics along it, the relevant portion, Topsy Grade Road near the J.C. Boyle Dam, is partially gravel and partially paved. It provides access to the Topsy Grade Recreation Area from OR66. Topsy Grade Road would give access to OR66 from the J.C. Boyle construction site, and Ager-Beswick Road would provide haul access, via Patricia Avenue, from Copco 1 and Copco 2 Dams to Yreka, California.
- **Unpaved access roads** – each dam has a small network of one lane, gravel access roads leading from either Copco Road or OR66 to the dams themselves. These roads are no wider than 15 feet and are no longer than ½ mile. Most of the traffic along these roads consists of PacifiCorp’s technicians accessing the facilities.

- **J.C. Boyle unpaved access roads** – While this road network shares the same characteristics of the other unpaved access roads, it has a small bridge linking the north and south sides of the dam. This is a key link and might play a role in construction activities. Figure 3.22-3 is a photo of this bridge.



Source: CDM 2010

Figure 3.22-3. Access Bridge at J.C. Boyle Dam

- **Lakeview Road** – a local road that accesses the Iron Gate Dam itself. Lakeview Road intersects with Copco Road at the entrance to the Iron Gate Recreation Area. A one-lane bridge crosses the river (see Figure 3.22-4) at this intersection linking to Lakeview Road. Lakeview Road is a gravel road that leads up to the top of Iron Gate Dam. It is approximately 24 feet wide and has a steep embankment on the east side, without a guardrail. Lakeview Road connects to an unnamed bridge access road. The narrow, gravel access road leads onto the top of Iron Gate Dam. For the purposes of further analysis, Lakeview Road would be considered an unpaved access road except when discussing the bridge.



Source: CDM 2010

Figure 3.22-4. Bridge Accessing Lakeview Road (looking south)

- **Baseline Transit Service** - The Siskiyou Transit and General Express is the only transit service in the KHSA area of analysis. It is a regional service that connects the downtowns of Dunsmuir, Weed, Mt. Shasta, Grenada, McCloud, Yreka, Montague, Fort Jones, Greenview, Etna, Klamath River, Horse Creek, Hamburg, Seiad Valley and Happy Camp. Service is very limited, sometimes running only one or two times a week. One route branches into the area of analysis and currently runs twice a week: the Hornbrook route. The Hornbrook route follows I-5 north into Hornbrook, turns east on Copco Road and then turns south (well before reaching the Iron Gate Dam) at Ager Road heading towards Montague, California.

In addition, Greyhound bus service runs on US97 connecting Klamath Falls to other cities in the region and to nearby Amtrak stations (Siskiyou County 2008). As with the Siskiyou Transit and General Express, this service is limited and is along a major US highway.

- **Non-motorized Transportation Network** – The area of analysis has very few or no sidewalks and no designated bicycle routes of any kind. Because various camp and recreational sites exist throughout the KHSA area of analysis, it should be expected that bicycle riders and pedestrians travel along Copco Road will be limited in capacity.

Specific information about the haul routes needed for construction and deconstruction activities as well as potential right-of-way requirements would be provided in the Detailed Plan for Facilities Removal. There would be subsequent environmental analysis on this plan to analyze traffic and transportation impacts from the Proposed Action.

3.22.3.2 KBRA –Road Network

The Upper Basin road network exhibits many of the same characteristics of the local access roads and other routes described for the KHSA area of analysis. Activities to be implemented that would likely affect transportation include the Phase I and Phase II Fisheries Restoration Plans. KBRA activities might include decommissioning local access roads, upgrading and/or replacing culverts to improve fish passage, and using backhoes and dump trucks to reshape channels and deliver gravel to augment fish spawning. Exact locations of these activities are currently undefined.

3.22.4 Environmental Consequences

3.22.4.1 Environmental Effects Determination Methods

Traffic Flow Effects

The scope of this analysis includes all roads that would experience construction related traffic. Routes were identified between each construction site and anticipated disposal sites. The greatest traffic flow effects would be nearest to the construction sites and those portions of the road were used during this analysis to assess potential impacts.

The Lead Agencies considered two components of traffic growth in evaluating future year conditions. First, the team determined an annual background growth rate based on historical data from 2000 through 2009. The Lead Agencies used that data to create a trend line and project baseline traffic volume to 2020. See Appendix T for the graphs showing these projections. Second, the Lead Agencies collected construction data including the number of construction trucks, construction truck routes and timing, number of workers, and worker traffic routes and timing. Lead Agencies provided this data for the project alternatives and added to the network any increases in traffic expected from each of the alternatives.

In addition to construction trucks hauling materials, construction workers accessing the sites may affect traffic flows in the area. Using construction worker forecasts and the current traffic volumes along available access roads, Lead Agencies projected traffic increases from workers. To access Iron Gate, Copco 1 and Copco 2 Dams, workers must travel along I-5 to Copco Road or Ager-Beswick Road. The worker access trip counts were assigned to these two roads. The J.C. Boyle Dam has two different directions from which workers might originate. In consideration of the current traffic volume to the east and west of J.C. Boyle Dam along OR66, this analysis uses the percentages of AADT to indicate how many workers might originate their trips from the east or from the west. Based on this analysis, the Lead Agencies assume that 12 percent of workers traveling to J.C. Boyle Dam would come from the west, taking I-5 to OR66 and 88 percent would come from the east, taking US97 to OR66.

The Lead Agencies used Caltrans accepted guidelines developed by the FDOT, along with road characteristics, to outline roadway planning capacities in the project area. The FDOT publishes a concise LOS Planning Handbook (2009) with service volume tables correlated to different roadway types and geometries, based on the Highway Capacity Manual (HCM). The HCM contains vast technical data that is very specific to traffic engineering technical analysis. The FDOT LOS Planning Handbook takes the detailed technical data from the HCM and summarizes it into a user friendly format that is appropriate for planning level analyses, such as is the case with this assessment.

Because the project area is remote and not generally considered to have peak commute times, the Lead Agencies assumed that existing traffic would largely be uniform throughout various times of day.

Traffic Safety Effects

Based upon site visit and map analysis, combined with review of planned truck hauling routes, the Lead Agencies identified roads with potentially hazardous points along them. Safety hazards include blind corners or turnouts and sharp turns or areas where slow construction traffic might conflict with high roadway speed limits. The Lead Agencies also assessed potential visibility hazards due to dust.

Public Transit Effects

The Lead Agencies examined the local and regional deconstruction traffic routes for each alternative and compared them to existing local and regional transit service routes to determine potential conflicts. The analysis relates traffic volumes to transit service because any road segments with projected traffic volumes over their functional LOSs could have disruptions in transit service.

Non-Motorized Transportation Effects

The Lead Agencies identified existing bikeways within the area of analysis and categorized them by class (bike path, bike lane, or bike route). The team also compared bikeways to construction traffic routes and timing to determine potential effects on the mobility and safety of cyclists. The team also reviewed available local or county planning documents addressing bicycle planning in the area of analysis to evaluate potential effects on planned bikeways. Although the project area would be a low pedestrian traffic area, the analysis addressed potential areas of conflict between trucks and pedestrians as well.

Road Condition Effects

In order to adequately assess the structural integrity and load carrying capacity of each road's surfacing section, a detailed geotechnical analysis would need to be conducted; this is out of the scope of this analysis.

3.22.4.2 Effects Determinations

Alternative 1: No Action/No Project Alternative

Traffic Flow Effects

Changes in traffic volumes could affect traffic flow. Any increase in traffic flow associated with the No Action/No Project Alternative would not exceed the planned LOS or v/c ratios for any roads in the area of analysis. **There would be no change from existing conditions from traffic flow effects.**

Traffic Safety Effects

Implementation of the Interim Measures (IMs) could cause traffic safety effects associated with sharp turns along Copco Road and OR66. Implementation of several interim measures, including IM 7 – J.C. Boyle Gravel Placement and Habitat Enhancement (for one year) and IM 8 – J.C. Boyle Bypass Barrier Removal could result in increased traffic from haul trucks and construction workers; however, any increases in traffic flow would be minor and would not contribute substantially to the number of vehicles on the road. **This fact combined with the installation of signage at sharp turns along OR66 and Copco Road would reduce traffic safety effects associated with implementation of the interim measures to less than significant.**

Road Condition Effects

Changes in the road conditions could occur. Roads in the area of analysis would not experience wear greater than that for which they were designed under the No Action/No Project Alternative. Any minor traffic safety conflicts would be mitigated through best management practices. **There would be no change from existing conditions from road condition effects.**

Public Transit Effects

Changes in public transit could occur. Public transit service would experience no negative effects from the No Action/No Project Alternative. Any minor public transit effects would be mitigated through best management practices. **There would be no change from existing conditions from public transit effects.**

Non-motorized Transportation Effects

Changes in non-motorized transportation could occur. There are no anticipated negative effects on non-motorized transportation due to the No Action/No Project Alternative. Any non-motorized transportation effects would be mitigated through best management practices. **There would be no change from existing conditions from non-motorized transportation effects.**

Ongoing Restoration Actions

While the KBRA would not be fully implemented under the No Action/No Project Alternative, ongoing restoration actions from Fish Habitat Restoration could have traffic and transportation impacts during construction activities.

Construction activities associated with the continued implementation of ongoing restoration actions could cause temporary effects to traffic and transportation.

Construction activities including channel construction, floodplain rehabilitation, fish passage and facilities construction, and breaching levees would likely involve the use of heavy equipment and construction vehicles. **Construction activities that would occur for the ongoing restoration programs are anticipated to result in potentially significant impacts to traffic and transportation. It is assumed that the use of best management practices incorporated into the project would minimize any traffic impacts to less than significant.**

Alternative 2: Full Facilities Removal of Four Dams (Proposed Action)

Traffic Flow Effects

Transportation of equipment and supplies associated with dam facility deconstruction activities could result in temporary traffic flow effects on I-5, OR66, US97, and access roads. No long-term or permanent traffic volume increases or long-term changes in traffic patterns are expected as a result of the Proposed Action. Therefore, any transportation impacts associated with the Proposed Action would be limited in duration to the proposed deconstruction or construction period. The deconstruction and reservoir restoration schedule for the Proposed Action extends 18-months starting in May 2019. Work completed in 2019 would include small scale construction staging activities and analysis of road and bridge condition and any repair work that might be identified during this analysis. The peak deconstruction activity and associated traffic would be generated in 2020; therefore this analysis is focused on the year 2020 when the largest effects would be anticipated.

The traffic projections for 2020, based on data from 2000 through 2009, indicate a decrease in baseline traffic on I-5 in California and OR66. In light of the recent increases in the cost of fuel and other economic factors, the years 2007 to 2009 may be an

anomaly. When that data was excluded, I-5 showed an increase, but OR66 still showed a small decrease in the 2020 projection compared to baseline. In each case, the combined total of the projected baseline traffic volumes and the traffic that would result from implementation of each of the alternatives would not exceed the significance criterion for I-5, OR66, or US97 for any of the alternatives.

Table 3.22-2 consolidates the roadway planning capacities and the anticipated traffic for each alternative, and contains projected LOSs and v/c ratios. Appendix S presents a detailed analysis of the hauling and worker trips for each alternative. Hauling trips include trips to a local recycling facility in Yreka, California as well as truck trips for additional deconstructed materials to disposal sites outside of the project boundaries. As Table 3.22-2 shows, none of the main roads in the area of analysis would experience volumes in excess of their planned LOS or v/c ratio due to traffic resulting from implementation of the Proposed Action or the other alternatives. **Traffic flow effects on I-5, OR66, US97, and access roads would be less than significant.**

Transportation of equipment and supplies associated with dam facility deconstruction activities could result in temporary traffic flow effects on on-site roads. The only routes of concern with respect to traffic effects are the on-site gravel roads at each dam. The short but frequent heavy vehicle trips anticipated as part of dam deconstruction and reservoir restoration (the Proposed Action could generate over 1,500 AADT at some locations) could cause traffic flow concerns. Signage and construction traffic management to reduce construction traffic generated impacts would be implemented. **Traffic flow effects on on-site roads would be less than significant.**

Construction activities associated with the demolition of recreation facilities could result in temporary traffic flow effects on I-5, OR66, US97, and access roads. The demolition of recreation facilities would take place following dam deconstruction activities. Truck trips associated with construction activities at recreation sites would occur after the peak traffic period calculated for dam deconstruction activities. **Therefore, traffic flow effects on I-5, OR66, US97, and access roads would be less than significant.**

Construction activities related to the relocation of the Yreka water supply pipeline could result in temporary traffic flow effects on I-5, OR66, US97, and access roads. Relocation of the City of Yreka's water supply pipeline would occur prior to the start of dam deconstruction. Therefore, related construction activities for pipeline relocation would take place well before the peak deconstruction activity involved in dam removal. **Traffic flow effects on I-5, OR66, US97, and access roads would be less than significant impact.**

Table 3.22-2. Traffic Flow Projections

Roads	Road Type	Planning Capacity			No Action/No Project			Full Facilities Removal of Four Dams (Proposed Action)		
		LOS	v/c Ratio	AADT	LOS	v/c Ratio	AADT	LOS	v/c Ratio	AADT
Interstate-5 (California)	Limited Access Interstate Highway	C	--	49,900	A	--	18,350	A	--	18,597
Interstate-5 (Oregon)	Limited Access Interstate Highway	--	0.85	63,700	--	0.24	15,100	--	0.24	15,112
OR66	State Highway	--	0.75	40,800	--	0.01	490	--	0.01	582
US97	US Highway	--	0.70	48,000	--	0.19	9,300	--	0.20	9,380
Copco Rd	Major Roadway	C	--	5,500	A	--	250	A	--	515
Topsy Grade Rd	Major Roadway	--	0.85	5,500	--	0.04	200	--	0.04	202
Unpaved Access Roads	Site Internal Gravel Roads	--	0.95	N/A	--	N/A	30	--	N/A	1,240
Roads	Road Type	Partial Facilities Removal of Four Dams			Fish Passage at Four Dams			Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate		
		LOS	v/c Ratio	AADT	LOS	v/c Ratio	AADT	LOS	v/c Ratio	AADT
Interstate-5 (California)	Limited Access Interstate Highway	A	--	18,593	A	--	18,454	A	--	18,530
Interstate-5 (Oregon)	Limited Access Interstate Highway	--	0.24	15,111	--	0.24	15,104	--	0.24	15,104
OR66	State Highway	--	0.01	574	--	0.01	514	--	0.01	514
US97	US Highway	--	0.20	9,373	--	0.20	9,320	--	0.19	9,320
Copco Rd	Major Roadway	A	--	511	A	--	354	A	--	430
Topsy Grade Rd	Major Roadway	--	0.04	202	--	0.04	200	--	0.04	200
Unpaved Access Roads	Site Internal Gravel Roads	--	N/A	1,240	--	N/A	102	--	N/A	966

Source: 1. Caltrans Traffic Data Branch, 2. FDOT 2009, 3. Klamath County 2004, 4. ODT 2010, 5. Amador County Transportation Commission, 2004.

Key:

v/c: volume-to-capacity ratio

AADT: Annual Average Daily Traffic

LOS: Level of Service

Implementation of the IMs could result in temporary traffic flow effects on I-5, OR66, US97, and access roads. Implementation of several IMs, including IM 7 – J.C. Boyle Gravel Placement and Habitat Enhancement (for seven years) and IM 16 – Water Diversions could result in increased traffic from haul trucks and construction workers; however, any increases in traffic flow would be minor and would not contribute substantially to the number of vehicles on the road. **Traffic flow effects on I-5, OR66, US97, and access roads from implementing the interim measures would be less than significant impact.**

Traffic Safety Effects

Activities associated with the Proposed Action, would cause traffic safety effects at each deconstruction site, on Copco Road, Topsy Grade Road, and on OR66. The Lead Agencies have identified three potential areas of concern within the area of analysis.

Haul truck movement on unpaved roads could cause traffic safety effects associated with dust along gravel roads. High trip volumes would create a substantial amount of dust in dry conditions on Copco Road, Lakeview Road, Topsy Grade/Ager-Beswick Road, and the roads leading to and surrounding each dam. Parts of these roads have gravel surfaces. The dust would create a substantial visibility hazard for vehicles on the deconstruction sites throughout the area. Installation of signage, dust abatement and proper construction traffic management that would be implemented as a part of the Proposed Action would reduce the severity of this effect. **Visibility hazards caused by traffic-related dust generation would be a less than significant impact.**

Transportation of materials to and from the dam sites could cause traffic safety effects associated with vehicle turnouts along Copco Road, Topsy Grade/Ager-Beswick Road and OR66. If Copco Road and the Topsy Grade, Iron Gate and Copco 1 Reservoir Recreation Sites are open,⁴ there would be substantial safety concerns regarding traffic at the entrance to each small recreation parking area; this includes the boat launch downstream of Iron Gate Dam. The access road for the J.C. Boyle Dam is immediately off of OR66, where the posted speed limit is 55 mph. This location, while providing a clear view of oncoming traffic, would have a safety conflict related to speed differentials between construction vehicle traffic and normal vehicular traffic. Construction vehicles could pose safety risks to passenger and other vehicles traveling on roads in the project area. Construction vehicles travel at slower speeds, require more acceleration and deceleration time, and slow or stop traffic to make turns. Left turns across oncoming traffic could pose safety risks if truck acceleration is slow and oncoming speed limits were high. The following locations could experience traffic safety hazards related to conflicts between construction vehicles and regular traffic:

- Three boat launches and three camp sites along Copco Road.
- The recreation area accessed from Topsy Grade Road.

⁴ With the removal of the facilities, reservoir recreation opportunities would no longer exist. It is possible that Copco and Topsy Grade Roads may be completely closed to non-project related traffic during deconstruction.

- One boat launch (access to the Klamath River) downstream of Iron Gate Dam, immediately adjacent to the bridge.

The installation of construction signage on OR66 and Copco Road in accordance with the Manual of Uniform Traffic Control Devices would reduce all traffic conflicts and alert oncoming traffic to slow merging construction traffic. **Traffic conflicts at vehicle turnouts along Copco Road, Topsy Grade/Ager-Beswick Road, and OR66 would be a less than significant impact.**

Vehicles associated with dam removal could cause traffic safety effects associated with sharp curves along Copco Road and OR66. Both OR66 and Copco Road have several sharp turns that could require large construction vehicles to travel at very slow speeds. Copco Road narrows along certain portions of the roadway, and has many winding turns, mirroring the shore of the lake. **The installation of signage at sharp turns along OR66 and Copco Road would reduce this impact to less than significant.**

Activities associated with relocation of the City of Yreka's water supply pipeline and relocation or demolition of recreation facilities could cause traffic safety effects associated with sharp curves along Copco Road and OR66. These construction activities would occur at different times than dam removal deconstruction activities; thus, there would be no overlap in traffic volumes associated with deconstruction of the dams. **This fact combined with the installation of signage at sharp turns along OR66 and Copco Road would reduce traffic safety effects to less than significant.**

Implementation of the interim measures could cause traffic safety effects associated with sharp turns along Copco Road and OR66. Implementation of several interim measures, including Interim Measure (IM) 7 – J.C. Boyle Gravel Placement and/or Habitat Enhancement, IM 8 – J.C. Boyle Bypass Barrier Removal, and IM 16 – Water Diversions could result in increased traffic from haul trucks and construction workers; however, any increases in traffic flow would be minor and would not contribute substantially to the number of vehicles on the road. **This fact combined with the installation of signage at sharp turns along OR66 and Copco Road would reduce traffic safety effects associated with implementation of the interim measures to less than significant.**

The relocation of existing recreation facilities from the banks of the existing reservoirs down slope to the new river bed could result in traffic impacts along adjacent roadways. Recreation facilities, such as campgrounds and boat ramps, currently located on the reservoir banks would need to be relocated down slope to be near the new river bed once the reservoir is removed. These construction activities would occur at different times than dam removal deconstruction activities; thus, there would be no overlap in traffic volumes associated with deconstruction of the dams. **This fact combined with the installation of signage at sharp turns along OR66 and Copco Road would reduce traffic safety effects to less than significant.**

Road Condition Effects

Existing roads and bridge structures near the dam sites may not have adequate strength capacity for construction vehicles. Under the Proposed Action, further analysis of road conditions and bridge weight capacities would be necessary. Roads in the area of analysis do not have heavy traffic volumes and some do not have traffic from heavy vehicles, such as construction trucks. Some of the roads in the area of analysis may not have been designed to sustain heavy loads.

Three existing bridges in the area of analysis might be important for deconstruction efforts, but could be incapable of supporting and withstanding the weight of heavy deconstruction and hauling vehicles. Initial analysis of these bridges by the Lead Agencies indicated the potential need for repair or replacement prior to dam removal. Siskiyou County's schedule for maintenance of these facilities is unknown. Bridges include:

- A bridge at Iron Gate Dam connecting Copco Road to Lakeview Road. This is the only route that provides access to the south side and top of Iron Gate Dam.
- A bridge at J.C. Boyle Dam that provides access to the south side and top of that dam from OR66. At this location, an alternate route via Topsy Grade Road would allow construction vehicles to access the dam and avoid the bridge.
- Daggett Road Bridge used to access the Copco 2 Powerhouse.
- Jenny Creek Bridge was constructed on accumulated sediment. Preliminary engineering assessments identified the potential for movement of sediment during reservoir draw down that could deem the bridge structurally unsound. Replacement of the bridge at an alternate location would be necessary.

While many of these roads and bridges were put in place to facilitate the construction of the Four Facilities, it is unknown whether they are in good enough condition to withstand the weight and frequency of trips during deconstruction. As part of the development of the construction plan, an in depth analysis of bridge and road capacity and state of repair would be conducted by the dam removal entity (DRE), with remedial actions taken prior to the commencement of facility deconstruction. Following completion of dam deconstruction additional analysis of road condition would be completed and where needed, as a result of wear generated by deconstruction repairs and or replacement actions would be completed. **Construction traffic could have significant impacts on roads and bridges in the project area. Analysis of road and bridge condition and repair prior to and following dam deconstruction along with implementation of Mitigation Measure TR-1 would reduce any impacts to less than significant.**

Public Transit Effects

Trip volumes and routes of material hauling and worker trips could affect regional transit service. While there are small overlaps between minor haul routes and public transit routes, deconstruction traffic is not expected to interfere with public transit service. **Effects on regional transit service would be less than significant.**

Non-motorized Transportation Effects

Heavy vehicle traffic could cause non-motorized transportation (pedestrian) effects. Although the area of analysis has no non-motorized transportation facilities, cyclists and pedestrians might travel along Copco and Topsy Grade/Ager-Beswick Roads in a limited capacity due to the recreational nature of the area. These pedestrians and cyclists would have to travel along the road itself, and could encounter safety hazards when sharing the road with large hauling vehicles, which could occupy much of the available road width, generate dust, or vary speeds around corners. Development of appropriate signage to notify of potential conflicts within the area would reduce this impact by warning drivers and non-motorized users. **The safety hazard for non-motorized transportation would be a less than significant impact.**

Keno Facilities Transfer

The transfer of the Keno Facility to United States Department of the Interior (DOI) could result in effects to traffic and transportation. The Keno Transfer, which would also be part of the Proposed Action, is a transfer of title for the Keno Facility from PacifiCorp to the DOI. This transfer would not result in the generation of new impacts on transportation compared with existing facility operations. Following transfer of title, DOI would operate Keno in compliance with applicable law and would provide water levels upstream of Keno Dam for diversion and canal maintenance consistent with agreements and historic practice (KHSa Section 7.5.4). **The transfer of the facility and recreation lands would result in no change from existing conditions from traffic or transportation.**

East and West Side Facilities Decommissioning

The decommissioning of the East and West Side Facilities could generate adverse traffic and transportation effects. Decommissioning of the East and West Side canals and hydropower facilities of the Link River Dam by PacifiCorp as a part of the KHSa would redirect water flows currently diverted at Link River Dam into the two canals, back in to Link River. Decommissioning of the facilities would generate some construction traffic. Routes used by this construction traffic would be signed and appropriate safety measures would be incorporated. **Decommissioning the facilities would have less than significant effects on traffic or transportation.**

KBRA

Construction activities associated implementation of several KBRA programs could cause traffic effects including increases in traffic, the presence of increased numbers of heavy construction equipment, and temporary road closures or detours. The following programs could cause these impacts:

- Phases I and II Fisheries Restoration Plans
- Fisheries Reintroduction and Management Plan
- Wood River Wetland Restoration Project
- On- Project Plan
- Water Use Retirement Program

- Fish Entrainment Reduction
- Klamath River Tribes Interim Fishing Site

Construction activities associated with the above-listed KBRA programs involving construction could cause temporary traffic effects. KBRA program implementation could result in temporary closures and/or traffic detours associated with culvert upgrades or replacement. In some cases, local access roads could be decommissioned. Minor amounts of vehicular traffic might need to identify alternate routes. Gravel augmentation activities for streambeds could result in gravel deliveries to various locations using dump trucks and placement using backhoes, which could cause traffic flow and safety effects and road condition effects. Construction activities including channel construction, mechanical thinning of trees, road decommissioning, fish passage and facilities construction, breaching levees, and fish hauling could cause temporary increases in traffic and traffic safety effects. It is assumed that construction related to some of these programs could occur on the same roads as the hydroelectric facility removal actions and could contribute to the effects of facility removal on traffic and transportation. **Due to the potentially large amount of construction activities that would occur for the various KBRA programs could generate adverse traffic effects; however, the implementation of best management practices would minimize any traffic impacts to less than significant. Additional traffic analysis and environmental compliance would be completed as appropriate.**

Operational activities associated with the Fisheries Reintroduction and Management Plan could result in temporary traffic effects associated with trap-and-haul activities. Haul trucks would be required to seasonally relocate anadromous fish species around the Keno Impoundment and Link River during periods of poor water quality. Haul trucks would carry upstream-migrating fish from the downstream side of Keno Dam to areas in Upper Klamath Lake and its tributaries. They would also carry downstream-migrating fish from Link River Dam to areas downstream from Keno Dam. Haul trucks would increase traffic on the roads between these sites. Haul trucks may travel on OR66 and US97, access roads, and on-site roads. As shown in Table 3.2-2, area roads carry substantially fewer vehicles in the Proposed Action than the Planning Capacity; adding a small number of additional truck trips each day for trap and haul operations would not substantially change traffic conditions. Hauling activities would occur after the peak traffic-generating period of facility removal because fish cannot access Keno Dam until after removal of the Four Facilities; however, some construction traffic associated with completing removal activities and reservoir restoration may occur at the same time as hauling operations. Construction traffic related to dam removal and hauling operations, taken together, could increase the severity of the traffic effects, but the combined traffic would likely still be less than the peak traffic during dam deconstruction. The timing of these trap and haul operations from the hydroelectric facility removal actions analyzed above reduce the potential for any negative traffic effects generated by these trap and haul actions from contributing to the effects of facility removal actions. **The traffic flow effects on OR66 and US97, access roads, and on-site roads would be less than**

significant. Implementation of specific plans and projects described in the KBRA would require future environmental compliance as appropriate.

Alternative 3: Partial Facilities Removal of Four Dams Alternative

Traffic Flow Effects

Traffic flow effects for the Partial Facilities Removal of Four Dams Alternative would be the same as those for the Proposed Action. **Traffic flow effects on I-5, OR66, US97, and access roads would be a less than significant impact. Traffic flow effects on on-site roads would be a less than significant impact.**

Traffic Safety Effects

Traffic safety effects for the Partial Facilities Removal of Four Dams Alternative would be the same as those for the Proposed Action. **Implementation of Alternative 3 would be less than significant.**

Road Condition Effects

Road condition effects for the Partial Facilities Removal of Four Dams Alternative would be the same as those for the Proposed Action. **Construction traffic could have significant impacts on roads and bridges in the project area. Analysis of road and bridge condition and repair prior to and following dam deconstruction along with implementation of Mitigation Measure TR-1 would reduce any impacts to less than significant.**

Public Transit Effects

Public transit effects for the Partial Facilities Removal of Four Dams Alternative would be the same as those for the Proposed Action. **Implementation of Alternative 3 would be less than significant.**

Non-motorized Transportation Effects

Non-motorized transportation effects for the Partial Facilities Removal of Four Dams Alternative would be the same as those for the Proposed Action. **Implementation of Alternative 3 would be less than significant.**

Keno Facilities Transfer

The effects of the Keno Transfer would be the same as those described for the Proposed Action.

Eastside and Westside Facilities Decommissioning

The effects of decommissioning the Eastside and Westside Facilities would be the same as those described for the Proposed Action.

KBRA

The Partial Facilities Removal Alternative would include full implementation of the KBRA. Therefore, impacts related to KBRA actions would be the same as under the Proposed Action, discussed above.

Alternative 4: Fish Passage at Four Dams

Traffic Flow Effects

Construction activities associated with the Fish Passage at Four Dams Alternative could result in temporary traffic flow effects on I-5, OR66, US97, access roads, and on-site roads. Under this alternative there would be no daily construction hauling trips on I-5, OR66, and US97. The only roads experiencing daily heavy vehicle trips would be the local unpaved roads adjacent to each dam. These roads would have 18 daily vehicle trips for fish passage construction, comprised of mainly concrete delivery from nearby batch plants. Material hauling trips would be limited, and worker trips would make up the majority of construction-related traffic. If concrete delivery were not provided at batch plants near the construction sites, then concrete delivery could come from either Klamath Falls, Oregon or Yreka, California. In this case, the estimated 18 daily vehicle trips accounting for concrete delivery would not only access the local roadways, but would be added to traffic on the other major roadways, as shown in Appendix T, 2020 Traffic Volume Projections. The addition of an additional 18 daily vehicle trips to the AADT volumes would not cause deterioration in levels of service.

No long-term or permanent traffic volume increases or long-term changes in traffic patterns would occur as a result of this alternative. Any incremental transportation impacts associated with this alternative would be temporary and would occur during the one-year construction period. The number of construction days at J.C. Boyle and Copco 2 Dams would both be less than 130 days; Copco 1 and Iron Gate Dams would have fewer than 290 construction days.

Traffic associated with this alternative would cause none of the roads in the area of analysis to have a LOS worse than A or a v/c ratio greater than 0.25. The combined total of the projected baseline traffic volumes and the traffic that would result from implementation of this alternative would not exceed the significance criteria for traffic flow impacts. **Traffic flow effects on I-5, OR66, US97, access roads, and on-site roads would be a less than significant impact.**

Implementation of the prescriptions provided by the United States Fish and Wildlife Service, DOI, and Department of Commerce in the Federal Energy Regulatory Commission (FERC) 2007 Environmental Impact Statement and seasonal trap and haul operations implemented at Keno Dam could result in temporary traffic flow effects on OR66 and US97, access roads, and on-site roads. Following construction of fishways to provide for volitional fish passage, interim seasonal trap and haul operations would be implemented at Keno Dam between June 15 and November 15 if dissolved oxygen and water temperatures no longer meet certain water quality criteria. As vehicle trips associated with trap and haul operations would take place following fishway construction, there would be no overlap between these trips and peak construction traffic. These activities would be similar to those described above under the Proposed Action in the KBRA Fisheries Reintroduction and Management Plan; however, the haul distance under Alternative 4 would be less. **Thus, traffic flow effects on OR66 and US97, access roads, and on-site roads would be less than significant.**

Traffic Safety Effects

Activities associated with the Fish Passage at Four Dams Alternative would cause traffic safety effects at each construction site, on Copco Road, Topsy Grade/Ager-Beswick Road, and on OR66. Traffic safety effects for the Fish Passage at Four Dams alternative would be almost exactly the same as those for the Proposed Action, with two differences: 1) the recreation sites along Copco Road from Iron Gate Dam to Copco Dams would remain open; and 2) construction related traffic would be much lighter than that of the Proposed Alternative. While the traffic volume under this alternative would be lower than under the Proposed Action, the safety impacts would be the same. Installation of signage, dust abatement and proper construction traffic management would minimize impacts. **This impact would be less than significant.**

Activities associated with the implementation of the prescriptions and seasonal trap and haul operations would cause traffic safety effects on OR66 and US97, access roads, and on-site roads. As described under the analysis of traffic flow effects, vehicle trips associated with trap and haul operations would take place following dam deconstruction. There would be no overlap between these trips and peak deconstruction traffic. These activities would be similar to those described under the Proposed Action in the KBRA Fisheries Reintroduction and Management Plan; however, the haul distance under Alternative 4 would be less. **Thus, traffic flow effects on OR66 and US97, access roads, and on-site roads would be less than significant.**

Road Condition Effects

Road condition effects for the Fish Passage at Four Dams Alternative would be the same as those for the Proposed Action. As part of the development of the construction plan, an in depth analysis of bridge and road capacity and state of repair would be conducted by the Hydropower Licensee, with remedial actions taken prior to the commencement of construction. Following completion of construction, additional analysis of road condition would be completed and where needed, as a result of wear generated by construction repairs and or replacement actions would be completed. **Construction traffic could have significant impacts on roads and bridges in the project area. Analysis of road and bridge condition and repair prior to and following construction would reduce any impacts to a less than significant level.**

Public Transit Effects

Public transit effects for the Fish Passage at Four Dams Alternative would be the same as those for the Proposed Action. **Implementation of Alternative 4 would be less than significant.**

Non-motorized Transportation Effects

Non-motorized transportation effects for the Fish Passage at Four Dams Alternative would be the same as those for the Proposed Action. Development of appropriate signage to notify of potential conflicts within the area would reduce this impact by warning drivers and non-motorized users. **The safety hazard for non-motorized transportation would be a less than significant impact.**

Trap and Haul – Programmatic Measure

Operation of trap and haul measures could result in temporary traffic effects. Haul trucks would be required to seasonally relocate anadromous fish species around the Keno Impoundment and Link River during periods of poor water quality. Haul trucks would carry upstream-migrating fish from the downstream side of Keno Dam to areas in Upper Klamath Lake and its tributaries. They would also carry downstream-migrating fish from Link River Dam to areas downstream from Keno Dam. Haul trucks would increase traffic on the roads between these sites. Haul trucks may travel on OR66 and US97, access roads, and on-site roads. As shown in Table 3.22-2, area roads carry substantially fewer vehicles in the Fish Passage at Four Dams Alternative than the Planning Capacity; adding a small number of additional truck trips each day for trap and haul operations would not substantially change traffic conditions. **The traffic flow effects on OR66 and US97, access roads, and on-site roads would be less than significant.**

Alternative 5: Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate

Because Copco 1 and 2 Dams are adjacent to one another, they share local access roads, and the greatest traffic effects at either of the dams would apply to both. Under this alternative, the traffic and transportation effects at Iron Gate, Copco 1 and Copco 2 Dams would be the same as Proposed Action and would be less than significant after mitigation, and the traffic and transportation effects at J.C. Boyle Dam would be similar to that of the Fish Passage at Four Dams Alternative and would be less than significant.

Activities associated with the implementation of the prescriptions and seasonal trap and haul operations could cause traffic safety effects on OR66 and US97, access roads, and on-site roads. As described under the analysis of traffic flow effects, vehicle trips associated with trap and haul operations would take place following dam deconstruction and fishway construction. There would be no overlap between these trips and peak construction-related traffic. These activities would be similar to those described under the Proposed Action in the KBRA Fisheries Reintroduction and Management Plan; however, the haul distance under Alternative 5 would be less. **Thus, traffic flow effects on OR66 and US97, access roads, and on-site roads would be less than significant.**

Trap and Haul – Programmatic Measure

Operation of trap and haul measures could result in temporary traffic effects. The trap and haul measures around Keno Impoundment and Link River would have the same impacts under the Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative as the Fish Passage at Four Dams Alternative. **The traffic flow effects on OR66 and US97, access roads, and on-site roads would be less than significant.**

3.22.4.3 Mitigation Measures

Mitigation Measures by Consequence Summary

Mitigation Measure TR-1 – Relocate Jenny Creek Bridge and culverts away from sediment deposits potentially susceptible to down cutting as a result of reservoir drawdown to prevent bridge foundation failure.

Effectiveness of Mitigation in Reducing Consequences

All of the mitigation strategies identified herein would reduce potential impacts to less than significant. Other actions that mitigate potential impacts would be standard, best management practices incorporated into project design activities. Such practices include construction zone signing and dust abatement, coupled with the periodic grading of roadways during construction. Implementation of these during project design and construction would reduce potential impacts to less than significant.

Agency Responsible for Mitigation Implementation

The DRE would be responsible for implementing mitigation measure TR-1.

Remaining Significant Impacts

Mitigation measures TR-1 would reduce traffic and transportation impacts to less than significant levels.

Mitigation Measures Associated with Other Resource Areas

Implementation of Mitigation Measure AR-1 could result in temporary traffic flow, traffic safety, and road condition effects on access roads and on-site roads. Mitigation measure AR-1 would relocate mussels in the Hydroelectric Reach and in the Lower Klamath River, downstream of Iron Gate Dam, to tributary streams or upstream of the Hydroelectric Reach. Relocation would take place prior to dam deconstruction activities and reservoir drawdown. Following dam deconstruction, mussels would be moved back to their approximate location or to other suitable habitat in the river. Given the timing of vehicle trips associated with relocation activities, there would be no overlap with peak construction traffic during dam removal. **Thus, the impact to traffic flow, traffic safety, and road conditions on access roads and on-site roads would be less than significant.**

Implementation of Mitigation REC-1 would create a plan to develop recreational facilities and access points along the newly formed river channel between J.C. Boyle Reservoir and Iron Gate Dam. Recreation facilities, such as campgrounds and boat ramps, currently located on the edge of the reservoir would need to be replaced in appropriate areas near the new river channel once the reservoir is removed. Recreation facility construction would take place following dam deconstruction activities and reservoir drawdown. Given the timing of vehicle trips associated with relocation activities, there would be no overlap with peak construction traffic during dam removal. **Thus, the impact to traffic flow, traffic safety, and road conditions on access roads and on-site roads would be less than significant.**

Several other mitigation measures may require construction, including mitigation measures H-2 (move or elevate structures with flood risk), GW-1 (deepen or replace wells), and WRWS-1 (modify water intakes). These measures could produce vehicle trips associated with construction activities. These activities would take place before or after the primary construction and deconstruction activities associated with the Proposed Action and other alternatives; therefore, they would not add to these construction traffic impacts. These construction activities are generally smaller efforts that would not cause a substantial increase in vehicle trips. **Thus, the impact to traffic flow, traffic safety,**

and road conditions on access roads, on-site roads, and on roads would be less than significant.

3.22.5 References

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