3. AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION

Chapter 3 looks at the beneficial and adverse impacts of the Project on transportation operations, environmental resources, and the community. Each section begins with a description of the existing conditions for a specific resource and then compares how the resource would be positively or negatively affected by the No Action Alternative, the Preferred Alternative EC-2, and Alternative EC-3. The study area for each resource is illustrated in the respective appendices. Mitigation measures to avoid, minimize, or mitigate adverse impacts that could result from the build alternatives are also identified for each resource.

3.1. TRAFFIC OPERATIONS

The Hood River Bridge provides an essential interstate connection between Oregon and Washington. The existing bridge connects White Salmon, Washington, and Hood River, Oregon, and was used by over 4.5 million vehicles in a 1-year period spanning July 2017 to June 2018. A substantial majority of the total vehicles crossing the Hood River Bridge per year are passenger automobiles or light-duty pickups. These vehicles make up over 97 percent total vehicles on the bridge, while larger vehicles (trucks and other heavy vehicles) make up approximately 2 percent to 3 percent of total traffic.

Large vehicles crossing the existing bridge are advised to turn in mirrors due to narrow lanes.

Traffic analysis for the Project included eight study intersections (Exhibit 3-1) and examined for two peak hours when traffic volumes were highest during the morning (7:30 am to 8:30 am) and afternoon (4:00 pm to 5:00 pm).

Exhibit 3-1. Study Intersections and Roadways

Existing Conditions

Current vehicle congestion levels and delays on the Hood River Bridge are moderate and deemed manageable during peak demand conditions. Overall, the existing conditions (2018) traffic analysis indicated that congestion on the bridge and at local intersections is more prevalent during the pm peak hour than the am peak hour (Exhibit 3-2). All study intersections operate within identified mobility standards under existing conditions. However, substantial congestion (over 60 seconds of average delay) can be experienced by vehicles in the pm peak hour when making westbound left turns and northbound left turns at the SR 14/Hood River Bridge signalized intersection. In addition, SR 14 exceeds the WSDOT mobility standard for the segment west of the Hood River Bridge.

The Hood River Bridge provides the only direct transportation connection between the cities of Hood River, Oregon, and White Salmon and Bingen, Washington. This single connection is an integral link between these cities, as well as the counties of Hood River, Klickitat, and Skamania (eastern portion), which enables this cross-river region to function interdependently. Freight destined to and originating from businesses on the Washington side of the river is often transported across the Hood River Bridge because of the faster and more efficient travel on I-84 located on the Oregon side of the river compared to SR 14, a two-lane Washington state highway with slower speeds due to tighter curves and multiple tunnels with height restrictions. Even if the origin and destination of the goods are both in Washington or other points north, crossing the Hood River Bridge, traveling 55 miles west on I-84, and connecting to I-205 in Portland to travel back to Washington typically reduces travel time and cost for freight shipments. The existing bridge, thus, provides economic value for the businesses and industries in the Washington portion of the Mid-Columbia region through its vital connection to the interstate highway system (i.e., I-84, I-205, I-5, and I-82).

Project Impacts and Benefits

No Action Alternative (2045)

The No Action Alternative (2045) reflects baseline conditions against which potential improvements are compared to assess impacts of the replacement bridge. The No Action Alternative would continue current tolling conditions with the exception that tolling is expected to be fully automated and electronic in the future. Technological advances are expected to make cash operations (via toll booth) obsolete so that all vehicle tolls would be collected electronically by 2045. This would remove the need for the toll booth to be operating on the south end of the bridge, and thus, eliminate any vehicle queues that sometimes occur at the toll booth when bridge demand is highest.

Based on historical use of the Hood River Bridge, forecasted traffic volumes are expected to grow up to 2 percent per year. This growth translates to an estimated 54 percent increase in traffic volumes by 2045 compared to existing (2018) traffic volumes, or the approximate equivalent of 90,000 additional vehicles using the bridge each year.

Compared to existing conditions, congestion at several intersections in the area of potential impacts (API) would substantially worsen with the No Action Alternative both in the am and pm peak hour as shown in Exhibit 3-3.

Exhibit 3-2. Peak Hour Traffic Delay for Existing Conditions (2018)

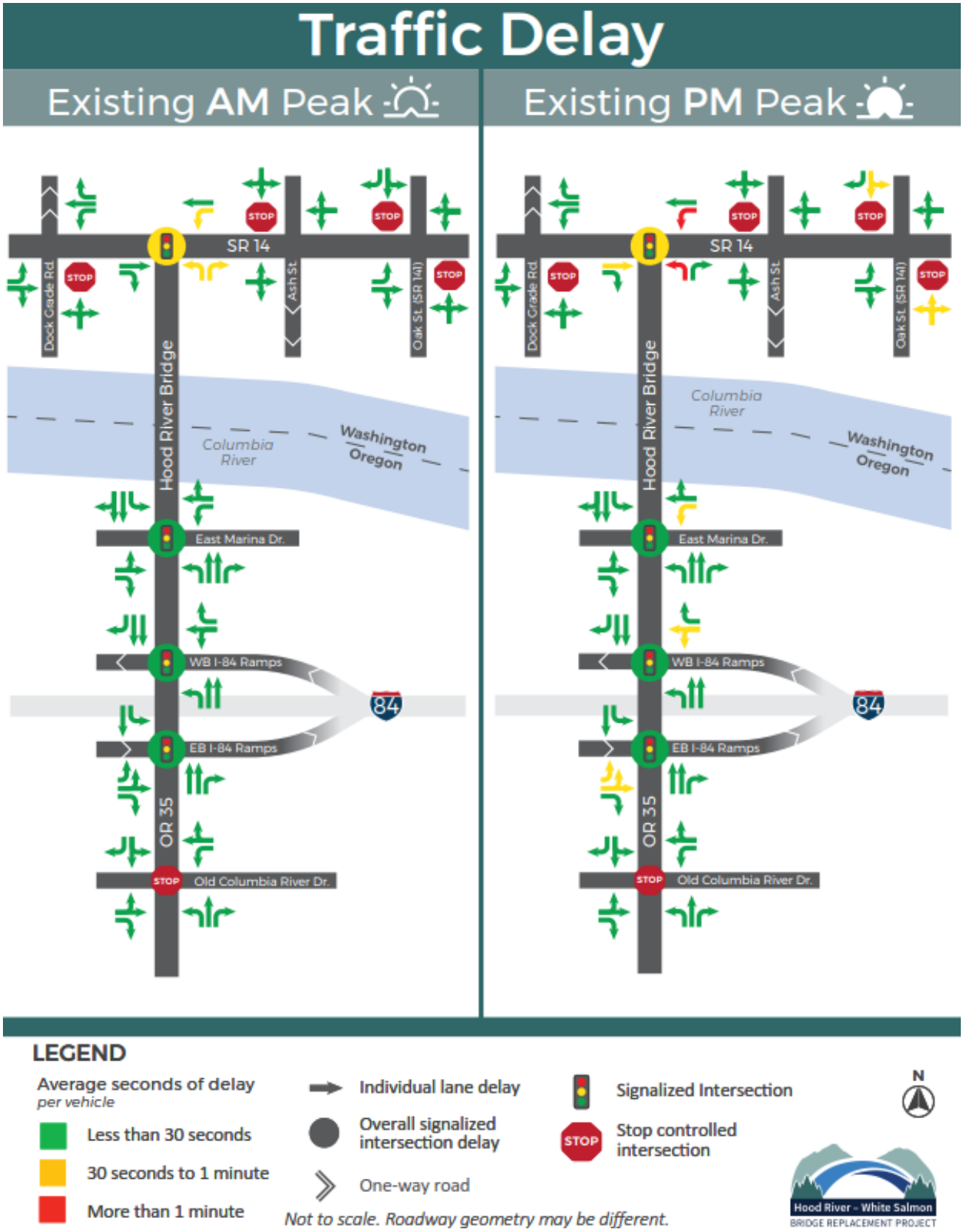


Exhibit 3-3. Average Delay per Vehicle for the Existing Conditions (2018) and No Action Alternative (2045)

	Existing Conditions (2018)		No Action Alternative (2045) Compared to Existing Conditions	
Study Intersection	AM peak hour 7:30 am - 8:30 am	PM peak hour 4:00 pm - 5:00 pm	AM peak hour 7:30 am - 8:30 am	PM peak hour 4:00 pm - 5:00 pm
SR 14 and Dock Grade Road*	17 seconds	24 seconds	22 seconds	62 seconds *158% more*
SR 14 and Hood River Bridge (SR 35)	37 seconds	47 seconds	65 seconds *110% more*	144 seconds *206% more*
SR 14 and Oak Street (SR 141)*	21 seconds	49 seconds	>200 seconds *>300% more*	>200 seconds *>300% more*
SR 14 and Ash Street*	14 seconds	17 seconds	25 seconds *79% more*	44 seconds *159% more*
Button Bridge Road and E. Marina Way	13 seconds	14 seconds	26 seconds *100% more*	20 seconds *43% more*
Button Bridge Road and Westbound I-84 Ramps	5 seconds	5 seconds	7 seconds	6 seconds
US 30 and Eastbound I-84 Ramps	15 seconds	20 seconds	18 seconds	23 seconds
Mt. Hood Hwy (US 30), OR 35, and Old Columbia River Drive (Old US 30)*	19 seconds	29 seconds	51 seconds *168% more*	162 seconds *>300% more*

Note: Percent change shown where change in average delay is more than 5 seconds.
* Indicates unsignalized intersections. Average delay reported for worst movements.

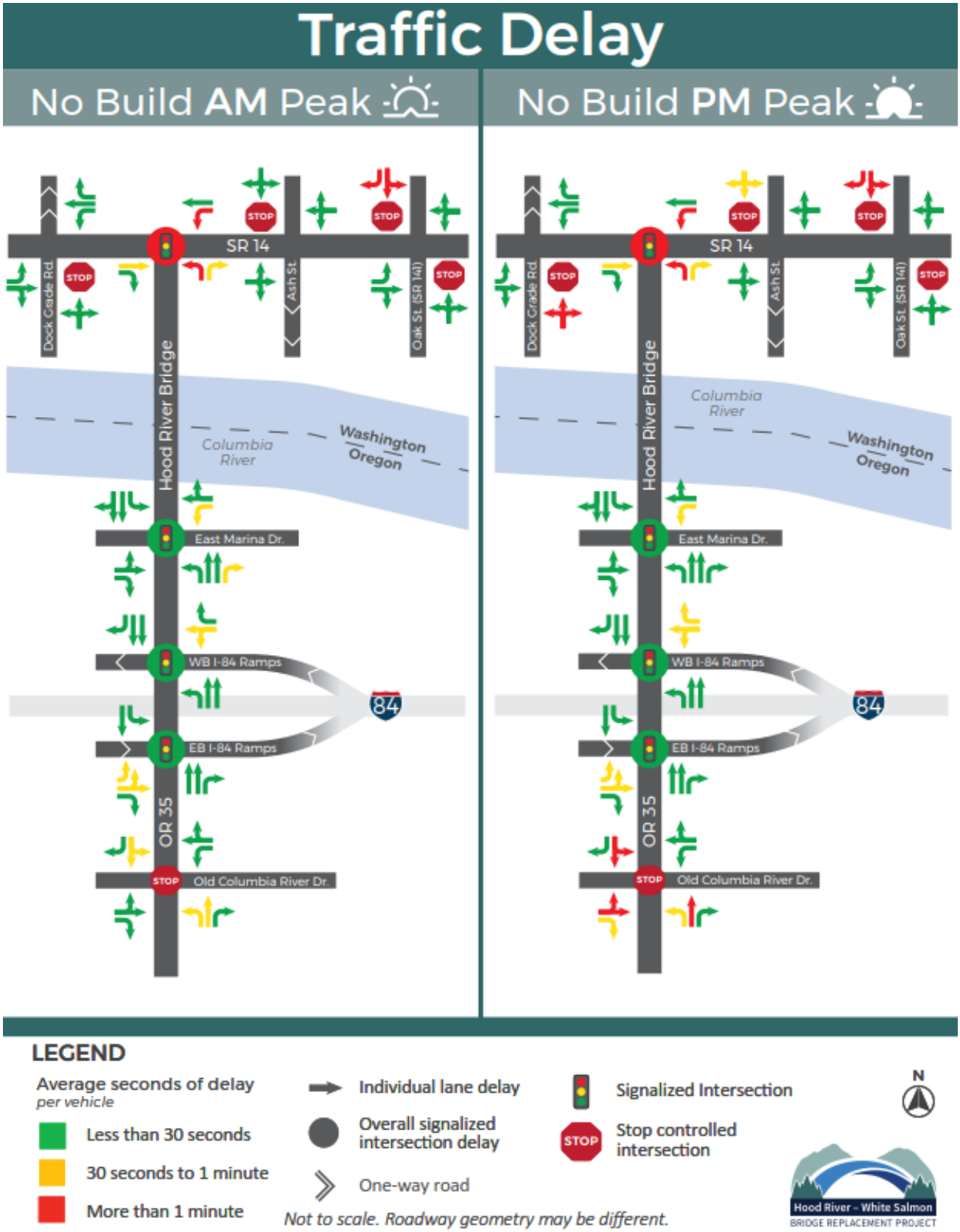
The following issues were identified based on the No Action Alternative (2045) traffic analysis results (Exhibit 3-4):

- Vehicles turning onto SR 14 from Oak Street (two-way stop) in downtown Bingen would experience severe delay of over 200 seconds on average during the am and pm peak hours.
- The SR 14/Hood River Bridge intersection (traffic signal) would see an increase in volume such that vehicle demand would exceed the available capacity during the am and pm peak hours. Thus, the average delay would increase to over 140 seconds per vehicle during the pm peak hour.
- US 30/OR 35/Button Bridge Road/Old Columbia River Drive (referred to as Button Junction [all-way stop]) would see an increase in volume such that vehicle demand would exceed the available capacity during the pm peak hour. As a result, the ODOT volume to capacity ratio mobility standard would be exceeded, and the average delay would increase to over 160 seconds per vehicle.[4]
- SR 14 would exceed the WSDOT mobility standard for highway segments near the Hood River Bridge.

The No Action Alternative would continue to provide a cross-river connection between Oregon and Washington until such a time in the future that the existing bridge would exceed its operational life or a catastrophic event occurs and the bridge would close. Congestion would continue to worsen with increases in average delay at several API intersections. When the bridge would close in the future, the No Action Alternative would result in indirect impacts of reduced transportation connectivity, increased travel times for those crossing the river, and increased traffic volumes on the Bridge of the Gods and The Dalles Bridge.

[4] This deficiency was previously identified in the City of Hood River Transportation System Plan (TSP) (DKS et al 2011) and the Interstate 84 Exit 63 & 64 Interchange Area Management Plan (DKS et al 2011).

Exhibit 3-4. Peak Hour Traffic Delay for No Action Alternative (2045)



Build Alternatives (2045)

Construction of the build alternatives would result in short-term impacts to traffic including lane reductions, lane closures, and traffic detours, which would likely increase delay and reduce travel time reliability for all vehicular traffic (passenger, truck, and emergency service). Some vehicles could divert from their normal travel patterns and the possibility of conflicts with people walking or on bikes could increase. The existing bridge would remain in operation until the replacement bridge is open to traffic so that cross-river connectivity would be preserved during construction.

The replacement bridge would result in long-term direct benefits by providing wider lanes and a shoulder in each direction for motor vehicles. Drivers could feel more comfortable using the bridge. Existing heavy vehicle restrictions would be eliminated, and vehicle speeds would increase with the higher speed limit. Travel time reliability would improve as disabled vehicles would not block the roadway due to the availability of roadway shoulders on the replacement bridge.

The design of the existing bridge (No Action Alternative) and replacement bridge (build alternatives) each have two lanes for motor vehicles; therefore, the replacement bridge would not substantially increase motor vehicle capacity. However, this analysis assumes an additional increase in bridge crossing volume of approximately 2 percent of future demand, or 40 additional peak hour vehicles, for both build alternatives (2045) in both am and pm peak hours. The increase is intended to reflect the expected improvement in driver comfort due to wider lanes and shoulders and the elimination of existing restrictions (based on size or weight) for very large trucks.

The average delay results for API intersections under both build alternatives (2045) would closely match the No Action Alternative (2045) at all API intersections except for the reconstructed SR 14/Hood River Bridge intersection, as shown in Exhibit 3-5 and Exhibit 3-6. The build alternatives assume the SR 14/Hood River Bridge intersection would be reconstructed as a roundabout. This intersection design would substantially reduce congestion during am and pm peak hours compared to the No Action Alternative resulting in a reduction of approximately 80 percent to 90 percent less average vehicle delay and substantial reductions in congestion for trips crossing the bridge.

Due to the minor increase in the traffic volumes between the No Action Alternative and the build alternatives, the average vehicle delay at most other API intersections would be slightly higher in the build alternatives compared to the No Action Alternative; these differences are not expected to be substantial (5 seconds or less of change in average delay).

Exhibit 3-5. Average Delay per Vehicle, Build Alternatives Compared to the No Action Alternative

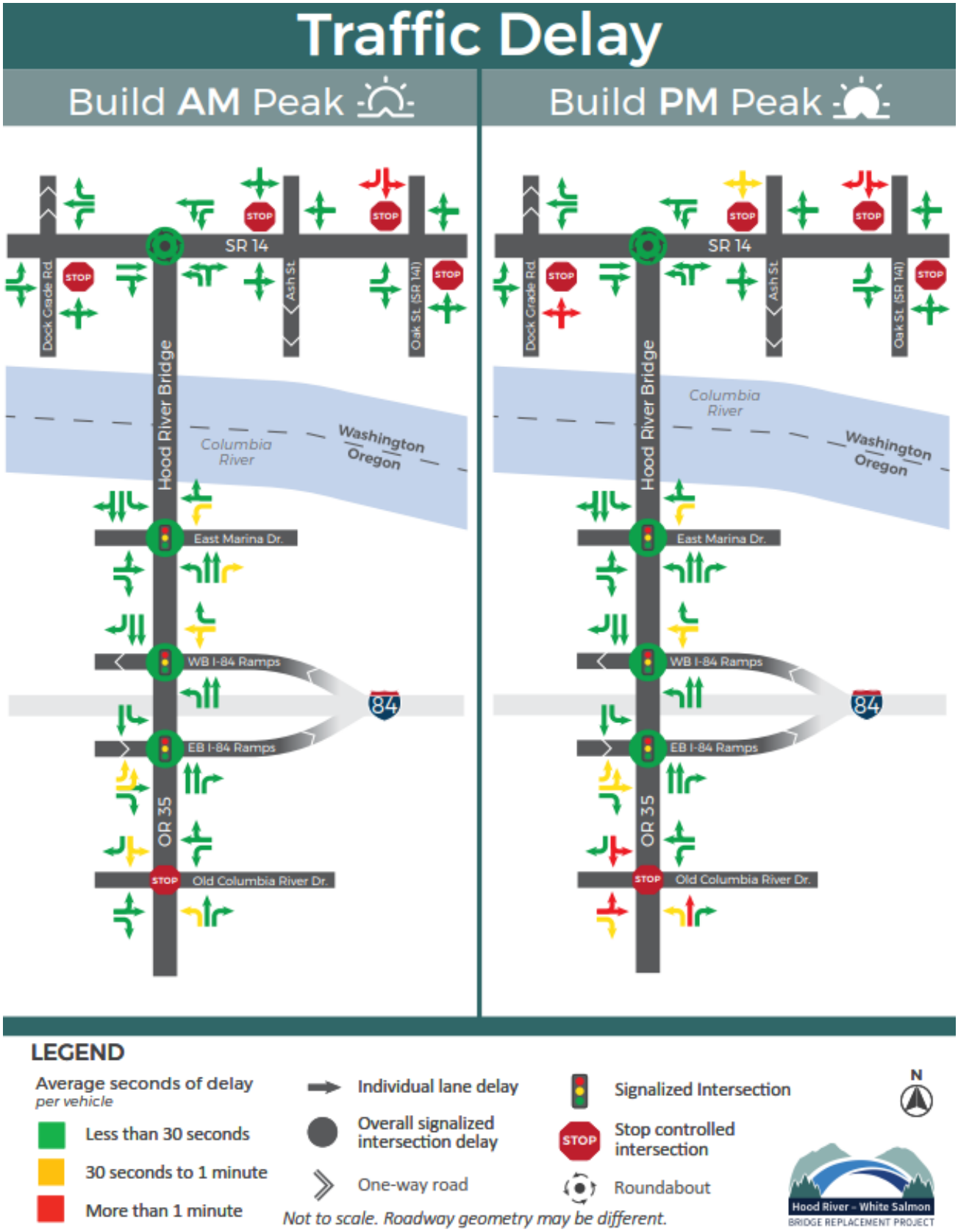
	No Action Alternative (2045)		Preferred Alternative EC-2 and Alternative EC-3 (2045) Compared to No Action Alternative	
Study Intersection	AM peak hour 7:30 am–8:30 am	PM peak hour 4:00 pm–5:00 pm	AM peak hour 7:30 am–8:30 am	PM peak hour 4:00 pm–5:00 pm
SR 14 and Dock Grade Road*	22 seconds	62 seconds	23 seconds	64 seconds
SR 14 and Hood River Bridge (SR 35)	65 seconds	144 seconds	12 seconds º *82% less*	19 seconds º *87% less*
SR 14 and Oak Street (SR 141)*	>200 seconds	>200 seconds	>200 seconds	>200 seconds
SR 14 and Ash St*	25 seconds	44 seconds	26 seconds	47 seconds
Button Bridge Road and E. Marina Way	26 seconds	20 seconds	21 seconds	20 seconds
Button Bridge Road and Westbound I-84 Ramps	7 seconds	6 seconds	7 seconds	6 seconds
US 30 and Eastbound I-84 Ramps	18 seconds	23 seconds	18 seconds	24 seconds
Mt. Hood Hwy (US 30), OR 35, and Old Columbia River Drive (Old US 30)*	51 seconds	162 seconds	51 seconds	162 seconds

Percent change shown where difference in average delay is more than 5 seconds.

* Indicates unsignalized intersections. Average delay reported for worst movements.

º Indicates the intersection is analyzed as a roundabout in the future build scenario. Average delay reported for worst movements.

Exhibit 3-6. Peak Hour Traffic Delay for the Preferred Alternative EC-2 and Alternative EC-3 (2045)



Under both build alternatives, the construction of a roundabout at the SR 14/Hood River Bridge intersection would resolve the congestion anticipated at this intersection. The other mobility issues identified in previous studies and the No Action Alternative (2045) would remain under both build alternatives (2045):

- Vehicles turning onto SR 14 from Oak Street (two-way stop), and the nearby turning movements at SR 14 and Maple Street (two-way stop), in downtown Bingen would experience severe delay during the am and pm peak hours.
- US 30/OR 35/Button Bridge Road/Old Columbia River Drive (all-way stop) would experience traffic volumes that exceed the available capacity during the pm peak hour.
- SR 14 would exceed the WSDOT mobility standard for segments near the Hood River Bridge. Although the roundabout located at the intersection of SR 14/Hood River Bridge would resolve the key traffic issue on the corridor, the segment analysis methodology is not sensitive to intersection design.
- No substantial impacts to traffic operations on SR 14 intersections in the City of Bingen were identified as a result of the Project.

Over time, construction of a wider, safer replacement bridge could result in the indirect impact of attracting additional vehicular traffic that was previously diverting to other bridges due to driver discomfort, heavy vehicle restrictions, delays to bridge lifts, or other reasons.

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to traffic operations:

- Minimize, to the extent practical, the movement of construction equipment and vehicles on the bridge during peak commute periods.
- Provide temporary access alternatives when existing access facilities are closed or otherwise are unusable.
- Coordinate with transportation officials of local jurisdictions to develop a detailed traffic management plan as well as work zone traffic control plans that provide a framework for detours, lane closures, staging plans, etc.
- Develop a public outreach program to include periodic media broadcasts, a newsletter, and Project website to inform residents and businesses in and around the Project area of changes in vehicle, freight, pedestrian, bicycle, or transit routes during construction.
- Maintain access to the existing Hood River Bridge throughout construction for all hours of the day except short-term closures as needed.
- Maintain access to the White Salmon TFAS.

Long-Term Impacts

No long-term mitigation measures related to traffic operations were identified.

Additional details of the traffic analysis and results are provided in the Transportation Technical Report (Appendix N).

3.2. Safety: Vehicle Travel, Emergency Response, River Navigation, and Seismic Resiliency

Existing Conditions

Crash History

The assessment of safety conditions on API roadways is based on the most recent available historical crash data from ODOT and WSDOT. Between 2013 and 2017, 11 crashes occurred at the four API intersections in Washington, with 36 percent injury-related and 64 percent involving property-damage only. Eight of these 11 crashes occurred at the SR 14/Hood River Bridge intersection. Most of these were rear-end crashes on SR 14, most likely due to driver inattention and/or following too closely.

Narrow lanes and the steel grated bridge deck create uncomfortable driving conditions.

Between 2012 and 2016, 39 crashes occurred near the four API intersections in Oregon, with 51 percent injury-related and 49 percent involving property-damage only. Fourteen (14) of the 39 crashes occurred at the Button Bridge Road/E. Marina Way intersection, with the majority being either rear-end or turning crashes.

All API intersections had reported crash rates well below 1.0 per million entering vehicles – a threshold typically indicating the need for further evaluation. There were no crashes involving fatalities in the API in the past 5 years of available data.

Vehicle Travel Safety Concerns

Safety concerns felt by drivers are not fully captured by the crash data. Members of the public have reported driver anxiety on the Hood River Bridge due to narrow lanes and steel grating and discomfort with traveling near oncoming vehicles, especially larger trucks, buses, trailers, and recreational vehicles. Vehicle damage such as scratches or side mirror contact may not be captured in the historical crash data.

Emergency Response

Law enforcement agencies in the area, as well as emergency service providers, can be potentially impacted by existing conditions on the bridge. Because there are no shoulders available on the existing bridge, drivers cannot pull over to allow emergency response vehicles to pass.

River Navigation Safety Concerns

The existing bridge has a horizontal navigation clearance of 246 feet, which is less than the U.S. Congressionally authorized 300-foot wide navigation channel, and creates difficulties for vessel navigation due to the narrowness of the opening. Barges using the Columbia River navigation channel typically measure 42 feet wide with doublewides at 84 feet. While barge lengths vary between 150 feet and 300 feet, lock sizes limit tow configurations (tugboat and its connected barges) to a total length of 650 feet. The substandard horizontal clearance for navigation under the current bridge has contributed to minor vessel contact to severe allision with the bridge; and, reports of near misses with the bridge are prevalent among river vessel pilots. The existing bridge has a vertical clearance of 57 feet in the closed position and 146 feet when the bridge is in the fully raised position. The lift span safely accommodates all vessels that have requested passage under the bridge.

Seismic Resiliency

The existing bridge is not seismically stable and is, thus, vulnerable to a seismic event.

Project Impacts and Benefits

No Action Alternative

Direct impacts of the No Action Alternative would likely include vehicle crashes in the API continuing to occur and even increasing in number as traffic volumes increase over time, although many of the crashes would likely be property-only damage as identified in Exhibit 3-7. Under this alternative, emergency response vehicles would experience slower response times through the API as congestion increases. The lack of roadway shoulder on the bridge would result in disabled vehicles blocking traffic flow and impacting emergency response time. For river navigation, the horizontal clearance of the bridge would remain substandard, contributing to vessel contacts and allisions with the bridge. At such a time in the future that the bridge would exceed its operational life or a catastrophic event occurs and the bridge is closed, the No Action Alternative would result in indirect impacts of requiring lengthy detours for emergency response vehicles to cross the Columbia River, which could be particularly problematic when emergency responders need to assist on the opposite side of the bridge.

Build Alternatives

Construction of either of the build alternatives could result in short-term impacts to emergency response as a result of travel time delays and reduced travel reliability when lanes are closed and/or detours are required. Further, drivers taking routes that they are not familiar with could result in additional crashes or other safety concerns.

Both build alternatives would be anticipated to result in long-term direct improvements to overall vehicle safety, emergency response, river navigation, and seismic resiliency (Exhibit 3-7). Driver comfort would be expected to improve, and instances of unreported close-calls or property-damage-only incidents could be reduced as a result of providing standard lane widths and shoulders.

Both build alternatives would widen the bridge horizontal navigation clearance that exceeds the navigation channel width and provide additional space for ships and barges to safely tack in windy conditions. The replacement bridge would be a fixed span bridge with a maximum 90-foot vertical clearance. This height would provide safe passage for current and known future vessels, although some vessels would need to lower masts prior passing under the bridge. Supported by the Navigation Impact Report created for the Project, USCG issued a Preliminary Navigation Determination. In addition, the replacement bridge would meet current design standards to be seismically sound under a 1,000-year seismic event and operational under a Cascadia Subduction Zone earthquake.

It would be anticipated that wider lanes and shoulders that would be available with the replacement bridge would allow vehicles to pull over on the bridge and make way for emergency response vehicles, resulting in improved response times for emergency vehicles. Further, if a vehicle would become disabled on the bridge, it could be moved to the shoulder to avoid blocking traffic and make it safer for all other vehicles to pass.

Improved travel time reliability through the API could result in indirect benefits including improved travel time for freight and other commercial vehicles and reduced commute time for workers.

Exhibit 3-7. Summary of Impacts and Benefits to Roadway Safety and Emergency Response

	No Action Alternative Compared to Existing Conditions	Preferred Alternative EC-2 and Alternative EC-3 Compared to No Action Alternative
Roadway Safety	• Likely increase in vehicle crashes due to higher volumes • Continued potential for property-damage-only incidents	• Improved driver comfort • Potential reduction in property-damage-only incidents • Separated pedestrian and bicycle facilities
Emergency Response for Critical Routes	• Slower response times due to increases in congestion	• Improved response times
Bicycle and Pedestrian Safety	• People walking or riding bicycles have no permitted access	• People walking or riding bicycles are separated from conflicts with vehicle traffic
River Navigation Safety	• Continued substandard horizontal clearance contributing to vessel contacts and allisions with the bridge	• Increases river navigation safety by providing horizontal clearances that meet current river navigation standards
Seismic Resilience	• Vulnerable to a seismic event	• Meets current seismic standards

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

For construction impacts to safety or emergency response, please see the proposed mitigation measures in Section 3.1, Traffic Operations.

Long-Term Impacts

No long-term mitigation measures related to vehicle travel safety or emergency response were identified.

Additional detail on roadway safety, emergency response, river navigation, and seismic resiliency is provided in the Transportation Technical Report (Appendix N).

3.3. Pedestrian, Bicycle, and Regional Transit Access

Existing Conditions

Pedestrian, bicycle, and transit options in the API provide various connectivity to jobs, services, and other community resources. Pedestrian and bicycle use is currently prohibited on the existing Hood River Bridge; however, limited sidewalk and bicycle facilities are located on some roadways in the API.

CAT and MATS provide public transit in Hood River and Klickitat counties.

Bicycle lanes are present on both sides of Button Bridge Road for approximately 600 feet between the eastbound I-84 ramps and E. Marina Way. No bicycle lanes are striped on nearby roadways in Washington. People on bikes could share lanes with vehicles on other roadways or use shoulders where available.

People riding bikes and walking use the Waterfront Trail on the Oregon side of the bridge. The trail includes a bicycle and pedestrian bridge across Hood River that connects to the Hood River Waterfront Park (via Nichols Parkway) and downtown Hood River (via Slough Trail and N. 2nd Street) to the west. A sidewalk along E. Port Marina Drive provides a pedestrian connection from Button Bridge Road sidewalks to the Waterfront Trail, and shared lane markings ("sharrows") provide a bicycle connection to the trail via E. Port Marina Drive, west of the Button Bridge Road/E. Marina Way intersection.

There are no sidewalks on the existing bridge approaches between SR 14 in Washington and E. Marina Way in Oregon. The SR 14 intersection at the Hood River Bridge includes a traffic signal with a marked crosswalk on the south side. There are curb-tight sidewalks on the south side of SR 14 for approximately 1.1 miles from Dock Grade Road eastward to the City of Bingen (about 0.3 mile west of Walnut Street). There are no sidewalks on N. Dock Grade Road, which provides a connection to the City of White Salmon, although the steep grade may limit access for some people.

Sidewalks have been constructed on each corner of the E. Marina Way intersection to serve marked crosswalks on each approach. South of E. Marina Way, sidewalks along Button Bridge Road are present on the east side only through the I-84 interchange and over the Union Pacific railroad tracks. The sidewalk terminates north of the intersection of Mt. Hood Highway (US 30), OR 35, and Old Columbia Drive.

Columbia Area Transit (CAT) and MATS are the public transportation providers in Hood River County and Klickitat County, respectively. CAT operates local and intercity bus routes and dial-a-ride service in Hood River County, but none of the fixed routes cross the Columbia River. MATS operates an intercity bus routes connecting the cities of White Salmon, Bingen, and Hood River. This route stops in the API at the Port. MATS fixed route service currently operates 10 times per day Monday through Friday with vehicles that provide bicycle racks. MATS also operates dial-a-ride service and a paratransit service line in the API.

Project Impacts and Benefits

No Action Alternative

The No Action Alternative would not result in any long-term, direct benefits or impacts on pedestrians and bicycles. This alternative assumes the existing bridge configuration would be maintained, including no permitted access for people walking or riding bicycles. No additional pedestrian or bicycle needs or improvements are assumed in the API beyond those identified in the 2011 Hood River Transportation System Plan (TSP). The TSP identifies sidewalk infill would occur on OR 35 as part of the previously identified improvements at the intersection of Mt. Hood Highway (US 30), OR 35, and Old Columbia River Drive (Old US 30). The TSP also identifies a proposed path crossing under I-84 connecting between Waterfront Trail and Dock Road on the east side of the Hood River.

For bicycle travel, the TSP identifies restriping projects on State Street (US 30) and OR 35 to provide bicycle lanes that would connect to the existing bicycle lanes on Button Bridge Road, located between the I-84 interchange and E. Marina Way. No indirect impacts to pedestrians or bicyclists are anticipated under the No Action Alternative.

Transit service would be directly impacted by the No Action Alternative from increased congestion projected for 2045, resulting in longer travel times and less reliable service in the API, as summarized in Exhibit 3-8. At such a time in the future that the bridge exceeds its operational life or a catastrophic event occurs and the bridge is closed, the No Action Alternative

would result in the indirect impacts of cross-river transit service likely being eliminated or requiring lengthy detours and longer travel times via the Bridge of the Gods or The Dalles Bridge.

Build Alternatives

Construction of the build alternatives would result in short-term impacts to pedestrians and bicycles using sidewalks and bicycle lanes in the API, including increased noise, dust, air pollution, and emissions, as well as additional traffic on detour routes, which could potentially increase conflicts with pedestrians and bicycles. Transit service would likely experience delays and reduced travel time reliability as a result of lane reductions, closures, and traffic detours, as listed in Exhibit 3-8.

In the long-term, the build alternatives would result in direct benefits to pedestrians and bicyclists. The replacement bridge would provide a barrier-separated shared use path as part of the transportation facility along the west side of the bridge for pedestrians and bicyclists. This would offer a new facility for people who want to walk or bike between Oregon and Washington and connect with the Waterfront Trail; no toll would be charged to pedestrians and bicyclists traveling on the shared use path.

Safe travel for people walking and cycling would be provided via the barrier-separated shared use path from vehicle travel lanes; however, crashes between cyclists and cyclists/pedestrians could occur on the shared use path. In addition, exposure to high winds for pedestrians and cyclists on the shared use path could be a safety concern during severe weather conditions.

Pedestrian connections to existing sidewalks would be available at marked crosswalks at the Button Bridge Road/E. Marina Way intersection in Oregon and the SR 14/Hood River Bridge intersection in Washington. Although the replacement bridge could result in additional pedestrian and bicycle demand, it would not affect access to any existing or planned bicycle facilities beyond these intersections. The potential for increased bicycle and pedestrian activity could result in the indirect impact of increasing the need for planned pedestrian and bicycle improvements nearby. The City of Hood River could consider increasing the priority and timing of these projects relative to what is identified in the TSP.

In addition, the replacement bridge would provide direct benefits to transit service with standard vehicle lanes and a higher design speed that would be expected to slightly improve travel times for transit service providers using the bridge. Service reliability could also be improved due to the presence of shoulders for disabled vehicles.

Depending on toll rates and transit costs, higher toll rates could potentially result in shifting some individuals from using their personal vehicles to cross the river to via non-motorized travel or taking transit, potentially resulting in slight increases in transit ridership.

Exhibit 3-8. Summary of Impacts and Benefits to Pedestrian, Bicycle, and Regional Transit Access

	No Action Alternative Compared to Existing Conditions	Preferred Alternative EC-2 and Alternative EC-3 Compared to No Action Alternative
Construction Impacts to Bicyclists and Pedestrians	• None	• Increased noise, dust, air pollution, and emissions • Temporary closure of Waterfront Trail access would require detour • Additional traffic on detour routes could increase conflicts
Long-term Impacts/Benefits for Bicyclists and Pedestrians	• No change	• New barrier separated shared use path for bicyclists and pedestrians • Improved safety for bicyclists and pedestrians • Access and connectivity to/from Waterfront Trail
Construction Impacts to Transit	• None	• Delays and reduced travel time reliability
Long-term Impacts/Benefits for Transit	• Increased transit travel times due to congestion • Decreased service reliability • Elimination of cross-river transit service if the bridge is closed or relocation to other bridges	• Improved travel time reliability

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to pedestrians and bicyclists traveling near the Project construction site:

- Pedestrian and bicycle access to Waterfront Trail would be maintained during construction. A signed, Americans with Disabilities Act (ADA) -accessible detour route would be provided when portions of the trail are temporarily closed during construction.
- Advanced notice about sidewalk, trail, and/or park closures and temporary access changes during construction would be provided.
- BMPs appropriate to the context would be developed for the Project prior to construction. These BMPs would be implemented during construction to reduce noise, dust, and pollutant emissions generated by construction equipment as further specified in Section 3.18, Air Quality and Greenhouse Gases, and Section 3.20, Noise and Vibration.

Long-Term Impacts

No long-term mitigation measures related to pedestrian, bicycle and transit access were identified.

Additional detail on pedestrian, bicycle, and transit access is provided in the Transportation Technical Report (Appendix N).

3.4. Land Use

Existing Conditions

Marketplace office and hotel suites at the Hood River Inn east of the existing bridge in Oregon.

The API contains a variety of land uses in Klickitat County, the City of White Salmon, and the City of Hood River. The City of Hood River has a higher concentration of existing development within the immediate vicinity of the bridge than the City of White Salmon and Klickitat County. The Washington portion of the API includes land within the city limits of White Salmon and Klickitat County. Land uses adjacent to the existing bridge include recreational areas, natural shoreline, a Native American TFAS (White Salmon TFAS) and fish processing facility (East White Salmon Fish Processing Facility), commercial uses, SR 14, and BNSF Railway tracks.

On the Oregon side, a handful of government uses have developed around the existing bridge in the City of Hood River, including the Port, Hood River Chamber of Commerce, and the Oregon Department of Motor Vehicles. The Port's Hood River Marina Park and Basin is located west of the existing bridge and includes a marina, beach, yacht club, boat launch, cruise ship dock, history museum, open lawn area, and parking. The existing bridge right-of-way (Button Bridge Road) north of E. Port Marina Drive is owned by the Port. Directly west of the existing bridge within this right-of-way there is some parking associated with the Port's administrative office, outdoor storage associated with the Port's maintenance shop, and a portion of the existing vehicle access to the administrative office and maintenance shop. West of the Port's right-of-way is a 12-acre parcel also owned by the Port, on which their administrative office, maintenance shop, boat launch and docks, a generator, and associated parking and access for these facilities is located.

A two-story mixed-use building (the Marketplace) contains primarily office uses with limited commercial space, as well as five hotel suites (Riverside Suites). The Best Western Plus Hood River Inn is the largest commercial user in the API, occupying multiple buildings east of the bridge and the Riverside Suites in the Marketplace building.

Within the API, the existing bridge and two build alternatives are located within two zoning designations – Riverfront District in the City of White Salmon and General Commercial in the City of Hood River. Each zoning designation would allow for the development of a replacement bridge subject to the proper land use procedures highlighted in the Land Use Technical Report.

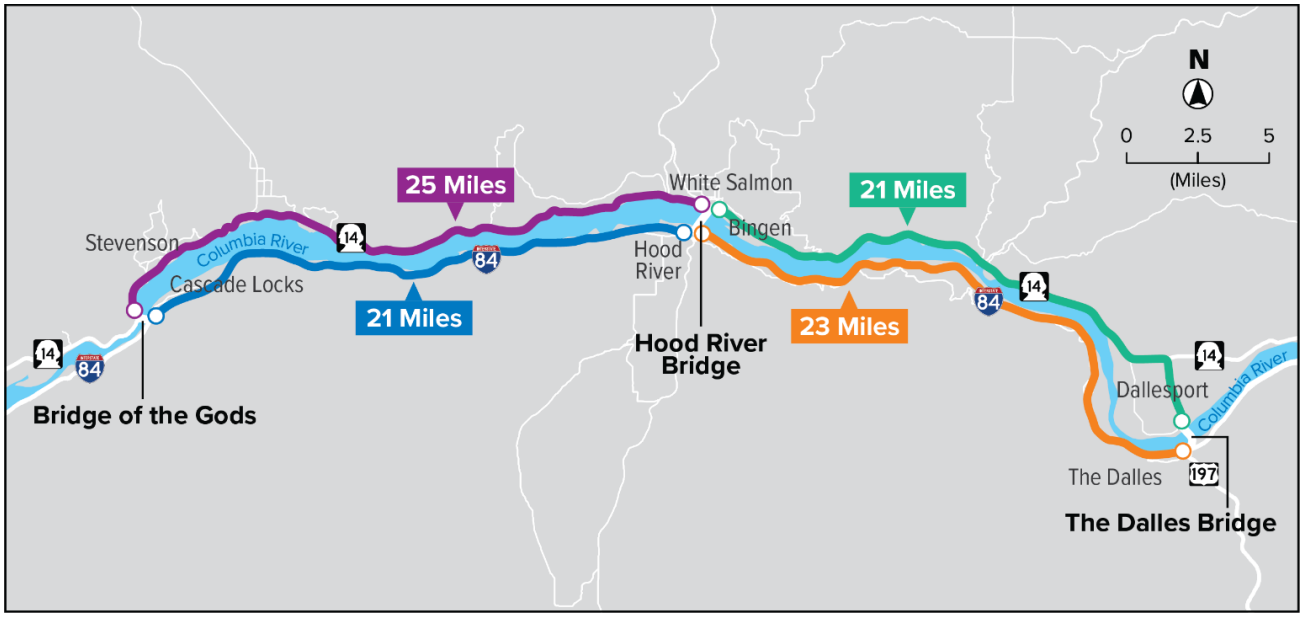
Project Impacts and Benefits

No Action Alternative

All Project alternatives were examined for consistency with applicable federal, state, and local plans and development regulations. The No Action Alternative was considered inconsistent with various local and regional planning documents that advocate for enhancing economic development through the movement of goods throughout the region, providing better bicycle and pedestrian connections for recreation and commuting, and establishing safer transportation infrastructure for all modes of travel (Appendix I, Land Use Technical Report). Retaining the existing bridge in its current condition would have direct impacts; it can be expected that maintenance costs would increase overtime as the bridge continues to deteriorate until it reaches the end of its structural life. In addition, due to the bridges age, condition, and seismic vulnerability, a substantial event such as an earthquake or barge strike could close the bridge temporarily or permanently.

The No Action Alternative assumes that the bridge would be closed in the future when it surpasses its operational life. At such a time, indirect impacts of the No Action Alternative would include vehicles traveling over 20 miles one-way to cross the Columbia River using The Dalles Bridge or the Bridge of the Gods (Exhibit 3-9). If the bridge were to close, either at the end of its operational life or because of damage from an unforeseen event, existing and future land uses could be affected. The existing bridge has existed for over 90 years and development has oriented around this river crossing. As such, land uses have become intertwined overtime and are now interdependent. The existing bridge allows workers, customers, freight, and visitors to cross the river rather easily. In the absence of a bridge in this location, the area could experience slower growth and business viability decline. In addition, future businesses could be deterred from locating in the area or existing bridge-dependent businesses could relocate elsewhere.

Exhibit 3-9. Columbia River Bridge Crossings



Build Alternatives

Each build alternative would be consistent with applicable federal, state, and local plans and development regulations. Construction impacts from the build alternatives could include traffic congestion and delays, limited access and detours, equipment noise, and air and dust emissions. At least two staging areas would be necessary for staging and storage of materials and equipment; the location of these areas would be determined later in the design process. While property access to adjacent parcels could be limited, it would be maintained throughout the duration of construction and any construction-related impacts would be temporary and short-term. Both build alternatives would require temporary construction easements, including roughly 6.6 acres of easements under Alternative EC-2 and 4.6 acres of easements under Alternative EC-3.

Direct property impacts would vary by alternative:

- Alternative EC-2: 3 full parcel and 11 partial parcel acquisitions, 3 permanent easements, relocation of a gas utility transfer station and generator, removal of parking and storage space on Port property and the potential relocation of the Port's administrative office and/or maintenance shop, and removal of some parking spaces at the Heritage Plaza Park and Ride facility (Exhibit 3-10 and Exhibit 3-11).
- Alternative EC-3: 2 full parcel acquisitions, 9 partial parcel acquisitions, 3 permanent easements, removal of some parking spaces at the Heritage Plaza Park and Ride facility, and the displacement of 8 commercial businesses and 5 hotel suites (Exhibit 3-12 and Exhibit 3-13).

Each of these acquisitions would result in converting property to transportation use. The total amount of property conversion would not be large and the potential use of this land for transportation purposes would not substantially affect existing or planned uses on either side of the river. Alternative EC-3 would convert 4.3 acres of property to transportation uses while Alternative EC-2 would convert 3.0 acres. If displaced businesses under Alternative EC-3 relocated within the City of Hood River, jobs and local tax revenues would be retained in the community; if they relocated outside of the city or chose not to reopen, jobs and local tax revenues would be reduced.

As shown on Exhibit 3-14, some Port parking, outdoor storage, and a portion of the existing vehicle access to the Port's administrative office and maintenance shop is located within the existing bridge right-of-way. The bridge approach for Alternative EC-2 would be located in this right-of-way area, displacing these uses.

Exhibit 3-10. Impacts to Land Use Resources in Washington under the Preferred Alternative EC-2

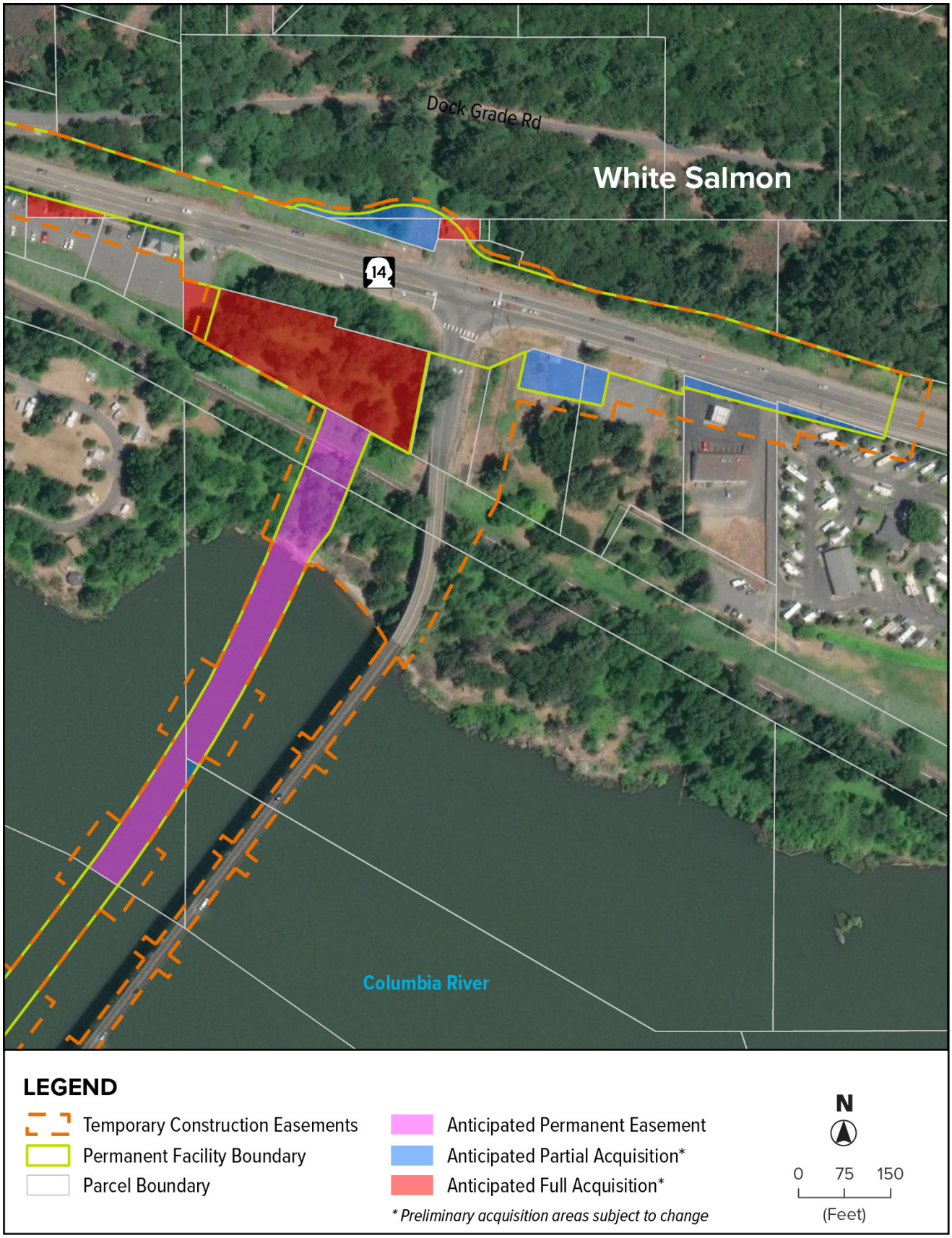


Exhibit 3-11. Impacts to Land Use Resources in Oregon under the Preferred Alternative EC-2

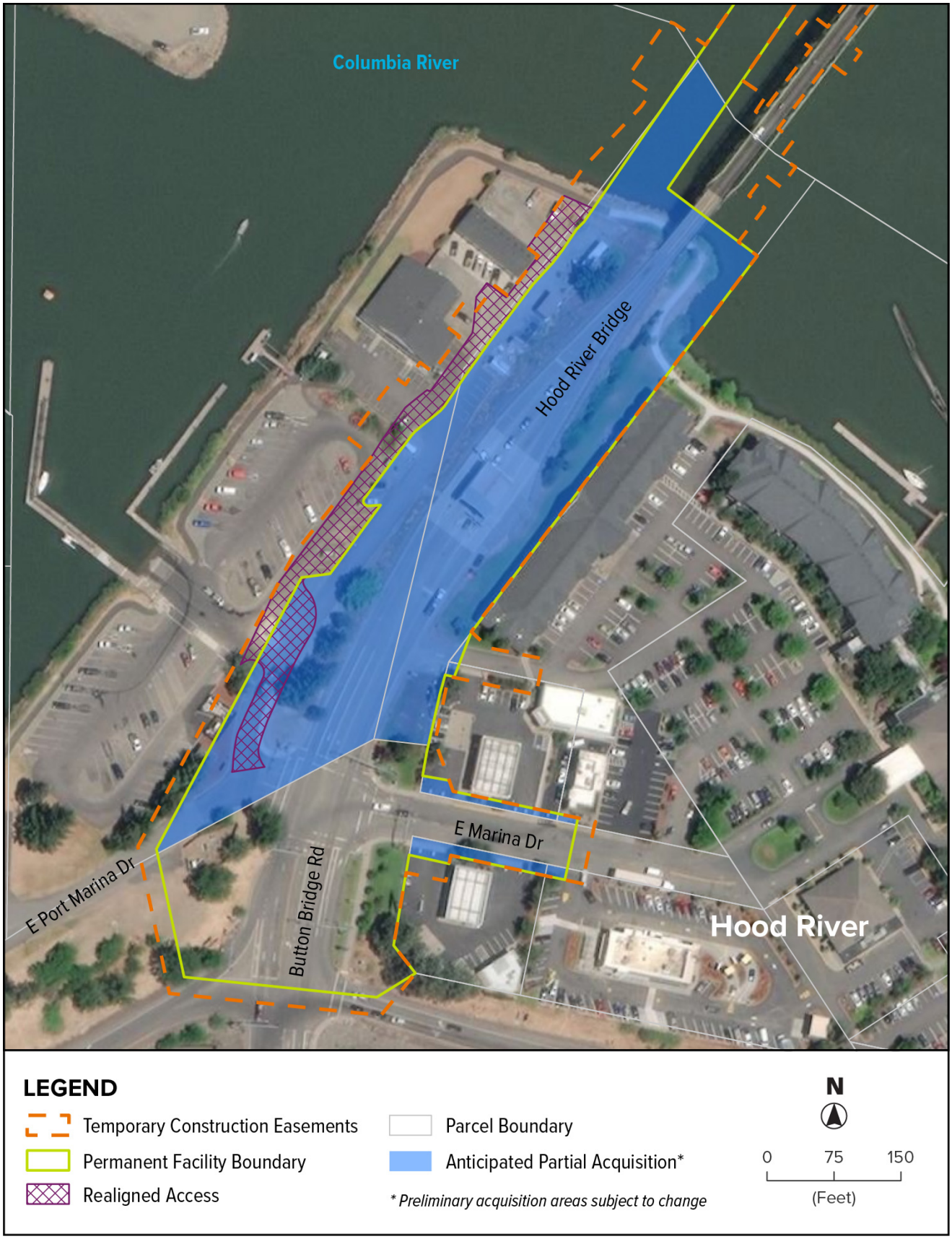


Exhibit 3-12. Impacts to Land Use Resources in Washington under Alternative EC-3

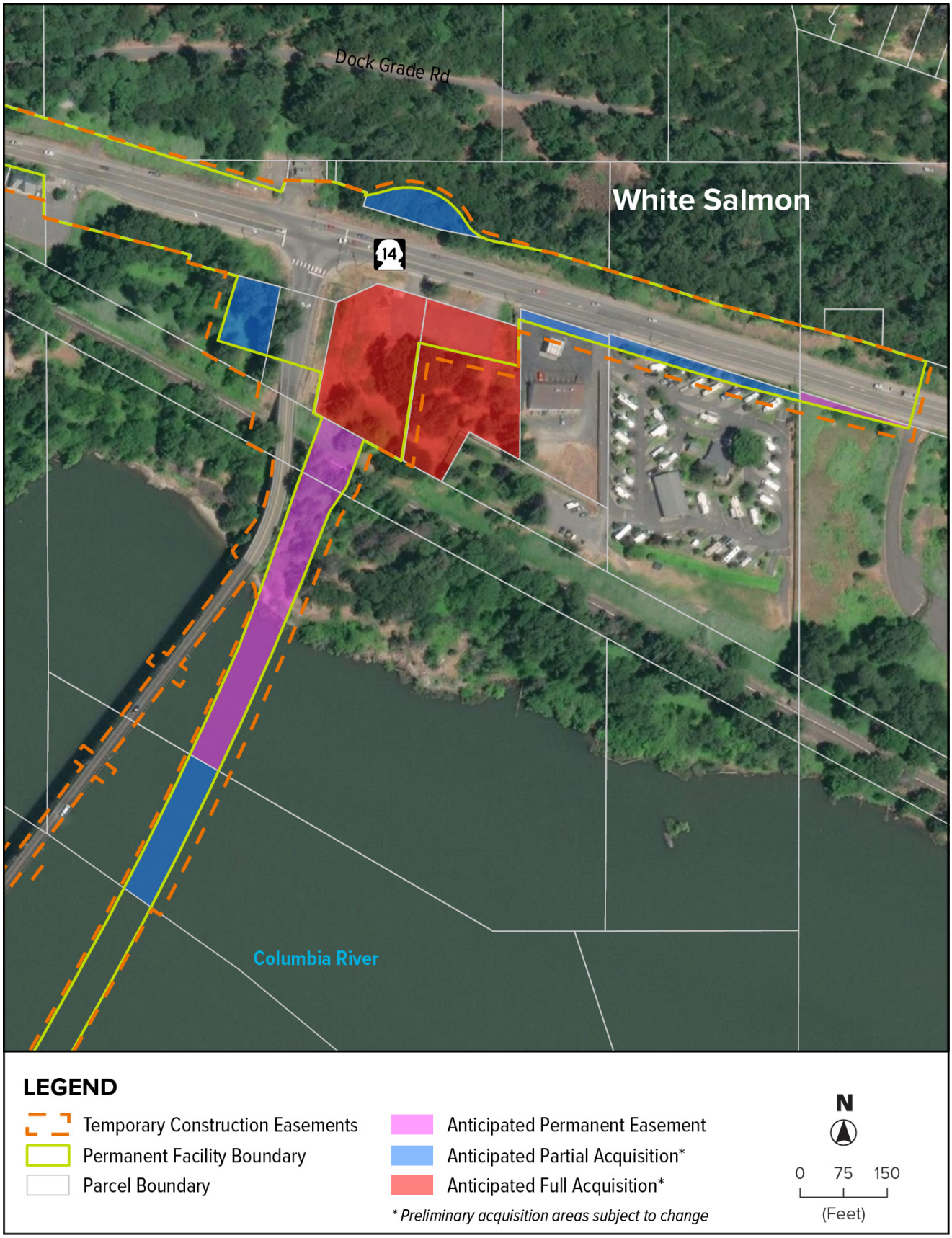
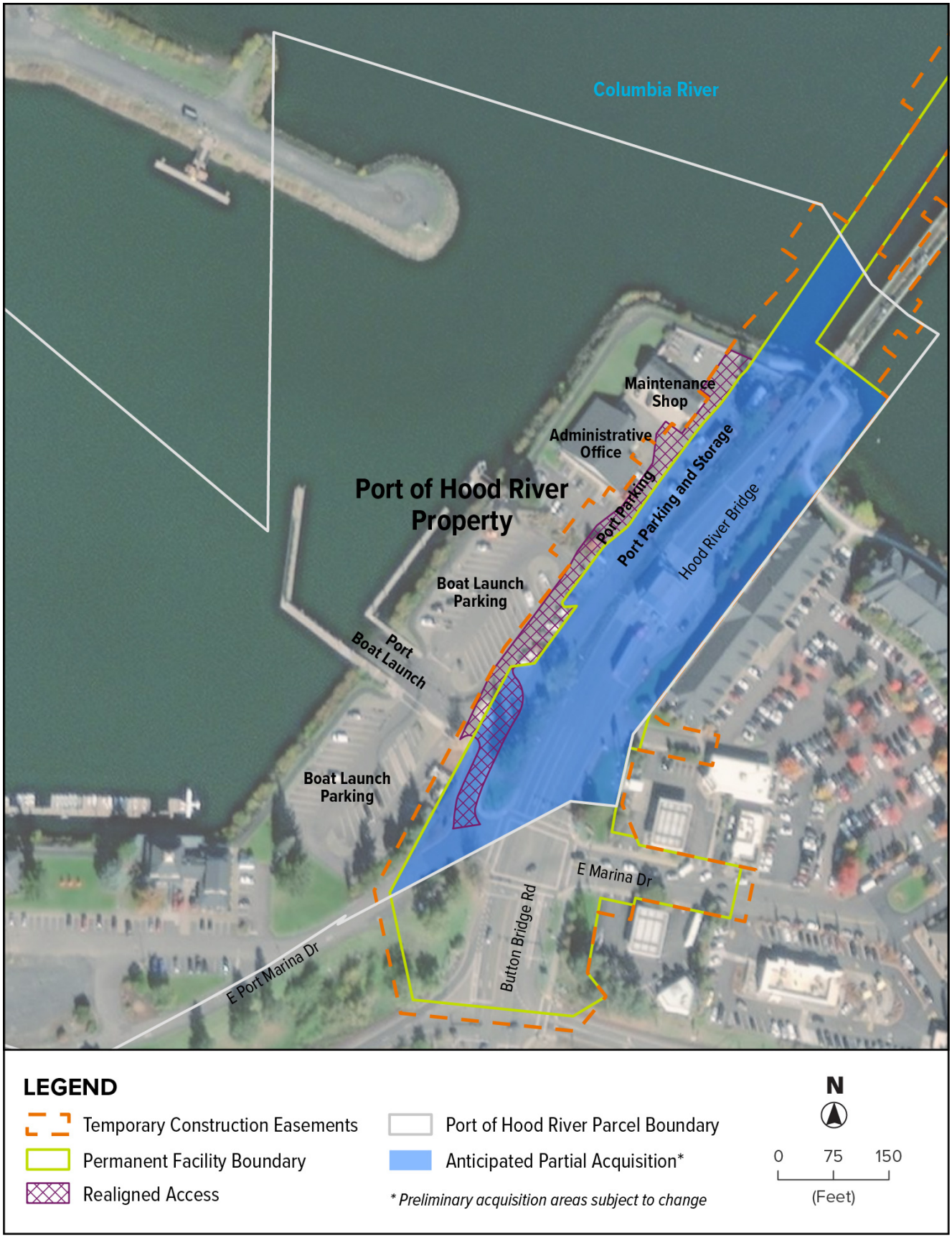


Exhibit 3-13. Impacts to Land Use Resources in Oregon under Alternative EC-3

Exhibit 3-14. Port of Hood River Land Use Impacts under the Preferred Alternative EC-2



In addition, construction activities of the bridge approach for Alternative EC-2 would encroach onto the Port parcel, located where the access road to the administrative office and maintenance shop is currently located; effectively eliminating this vehicle access to these buildings while this segment of the bridge is under construction. Employees and visitors accessing the administrative office during construction could park in the boat launch parking lot south of the office and then walk to the office. However, maintenance trucks and other large vehicles would still need to access the maintenance shop and would need a temporary, alternate route during construction. Once constructed, permanent access to the Port's administrative office, maintenance shop, boat launch, and parking would be realigned to the west of the existing access. A Port generator, located south of the administrative office along the existing access road, would also have to be relocated during construction as well as existing underground utility lines under the existing access road.

Under Alternative EC-2, long-term land use impacts to the Port property would include 1.2 acres of property acquisition and the loss of roughly 15 parking spaces supporting the administrative office and 3 parking spaces supporting the boat launch and docks. Roughly 2.6 acres of the existing bridge right-of-way that is owned by the Port would remain as right-of-way for the replacement bridge or be repurposed for new stormwater treatment facilities. The outdoor storage area that would be displaced would need to be relocated elsewhere on the Port's property near the maintenance shop, if the existing shop is not relocated.

If construction or permanent impacts to either the Port's administrative office and/or the maintenance shop occur that render the buildings nonfunctional, such as a detrimental permanent loss of parking for the administrative office, inability to find an alternative access for the maintenance shop during construction, inadequate horizontal clearance to the maintenance shop for large trucks after the access is realigned, or the permanent loss of storage area supporting the shop, then the buildings may be required to be relocated elsewhere on Port property.

Both build alternatives would require a permanent aerial easement over the BNSF Railway tracks and the future Bridge Park on the Washington side and would close an existing private access off Button Bridge Road in the City of Hood River. Alternative EC-2 would require an aerial easement to span the submerged portion of the White Salmon TFAS as well as an easement to place a bridge pier on TFAS property. Alternative EC-3 would require an easement on the East White Salmon Fish Processing Facility for road improvements to SR-14. Easements on tribal properties would require approval from the BIA (See Section 3.5, Treaty Fishing Rights, for more information to impacts to the White Salmon TFAS and East White Salmon Fish Processing Facility.) A USACE restrictive easement is located in-water and along portions of the Washington shoreline. One of the bridge piers would be located within this restrictive easement, requiring USACE Real Estate Action approval. Alternative EC-3, which is proposed east of the existing bridge, would directly affect future redevelopment of the Marketplace building into a hotel, as this bridge alignment would encroach onto this property. Additionally, Alternative EC-3 would create substandard access conditions for businesses east of the bridge along SR 14.

Indirectly, existing and future land uses stand to benefit from a replacement bridge, and economic conditions could be enhanced, as it would accommodate additional modes of travel between states from the addition of the shared use path, increase access for pedestrians and bicyclists, and improve the movement of goods and services throughout the region by providing a wider bridge without size and weight restrictions. Additional opportunities for bicycle tourism in the region would be provided with the new shared use path across the river. A future waterfront park ("Bridge Park") is planned under the existing bridge along the Washington shoreline. The existing bridge location was incorporated into the preliminary design for the park; therefore, an indirect impact of the build alternatives could be an alteration to the design of this future facility. Anticipated impacts to this future facility are described in the Project's Parks and Recreation Technical Report and Chapter 6, Section 4(f) Analysis.

A variety of future land uses are planned throughout the area to support growing populations in the cities of White Salmon, Bingen, and Hood River, indicating steady growth not tied to the replacement of the existing bridge. While these cities are experiencing steady growth, several factors constrain growth and would determine the extent to which growth takes place, including local comprehensive plans, zoning ordinances, and the CRGNSA Management Plan. Neither of the build alternatives would require any changes in zoning or comprehensive plan designations; and therefore, would not impact the type or density of development allowed in the area. Any infill development opportunities in urban areas surrounding the bridge are already planned for by local plans and growth is limited in the CRGNSA outside of urban areas. The existing bridge approach right-of-way may be repurposed for other uses such as stormwater facilities or accessways to other publicly-owned parcels near the river. If the right-of-way was vacated, developable land could be created; however, the amount of land created would be considered negligible. As such, the build alternatives would not be expected to influence growth in the area. Exhibit 3-15 summarizes land use impacts by alternative.

Exhibit 3-15. Summary of Impacts to Land Uses

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Localized Impacts	• No construction impacts	• Temporary localized impacts on land use, including traffic congestion and delay, reduced access, equipment noise, and air and dust emissions	
Temporary Construction Easement Acreage	• N/A	• 6.6 acres	• 4.6 acres
Plan Consistency	• Inconsistent with 9 plans and policies	• Consistent with all plans and policies	
Existing Bridge Retention	• Increased maintenance costs • Bridge closure due to unreasonable maintenance costs, reaching the end of its usable lifespan, or a catastrophic event rendering the bridge unusable	• N/A	
Property Acquisition Acreage	• N/A	• 3.0 acres	• 4.3 acres
Full Acquisitions	• N/A	• 3	• 2
Partial Acquisitions	• N/A	• 11	• 9
Permanent Easements	• N/A	• 4	• 3
Displacements/ Relocations	• N/A	• Portion of the Heritage Plaza Park and Ride Facility • Relocation of a gas utility transfer station • Relocation of a Port generator • Relocation or loss of a portion of Port parking supporting the administrative office, maintenance shop, and boat launch and docks • Potential relocation of Port administrative office and/or maintenance shop	• Portion of the Heritage Plaza Park and Ride facility • 8 commercial businesses and 5 hotel suites
Road Closures/ Access Changes	• N/A	• Closure of private access to uses east of Button Bridge Road • Realigned access to Port facilities	• Closure of private access to uses east of Button Bridge Road • Substandard access conditions for businesses east of bridge along SR 14
Planned Land Uses	• N/A	• No direct impacts to planned land uses are anticipated	• Direct impact to the planned redevelopment of the Marketplace building

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Indirect Impacts and Benefits	• Not seismically stable • Structurally and functionally limited (weight, height, and width restricted) • Limits to efficiency and scale of regional economy resulting from the future bridge closure	• Project would not likely increase population growth • Economic and community benefits due to increased bicycle and pedestrian access, tourism potential, and improvements to the movement of goods and services • Potential design revisions to the proposed Bridge Park	

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to land uses:

- Close coordination would be conducted with adjacent land and business owners to address conflicts and inconveniences from construction-related activities.
- Notice of upcoming traffic impacts would be provided to affected businesses and property owners on a frequent basis.
- Advanced notice of potential access or utility disruptions that could occur as a result of construction activities would be provided to affected property owners, tenants, and residents.
- To the extent practical, mature trees and existing vegetation would be preserved to retain a visual screen between construction activities and surrounding areas.
- To the extent practical, API staging areas would be shielded from, or located outside, the view range of neighborhoods and high activity recreation sites.

Long-Term Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate long-term impacts to land uses:

- Landscaping and any site furnishings removed during reconstruction of Button Bridge Road would be replaced and restored to their original condition.
- All acquisition of real property required for the construction of the replacement bridge would comply with the requirements of the federal Uniform Act , the Washington Relocation Assistance – Real Property Acquisition Policy (RCW 8.26), or the Oregon Relocation of Displaced Persons statutes (Oregon Revised Statutes [ORS] 35.500 – 35.530).
- Unless otherwise waived or adjusted by the applicable federal, state, or local agency, substantive requirements of the applicable federal, bi-state, state, and local land use statutes, including zoning, shorelines, and critical area regulations, would be followed to protect land uses, resource lands, and critical areas.

Additional detail on land use resources is provided in the Land Use Technical Report (Appendix I).

3.5. Treaty Fishing Rights

Existing Conditions

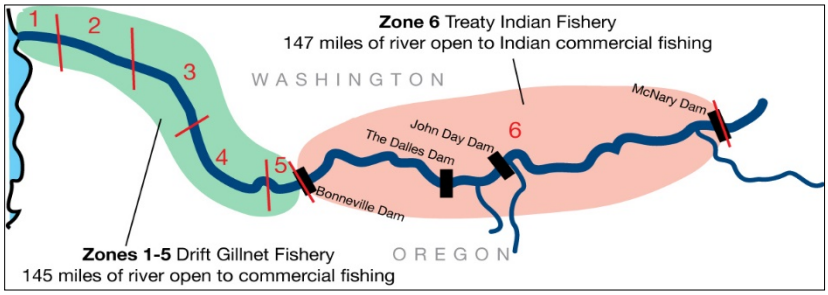
Source: CRITFC
The reservations and ceded lands of the four Columbia River treaty tribes

Tribal communities have been present in the Columbia River Gorge since time immemorial. Fishing, hunting, and gathering were and continue to be central practices of their culture. Specifically, fishing for salmon, steelhead, lamprey, sturgeon, and other species has been a focus of their presence along the Columbia and in the Gorge. Fish caught in the Columbia River provide sustenance and ceremonial resources that were and continue to be of great importance to indigenous tribes on the river (CRITFC 2014). In 1855, a number of tribes with ties to the Columbia River entered into multiple treaties with the U.S. government; becoming four federally-recognized tribes while ceding millions of acres of their lands to the U.S. The tribes reserved lands that now constitute their reservations, as well as the rights to fish at their usual and accustomed places and the rights to hunt, gather, and graze. This included areas both on and off their reservations, and those rights continue to the present. The four tribes with those reserved rights are commonly referred to as the Columbia River treaty tribes and include the Warm Springs, CTUIR, the Yakama Nation, and the Nez Perce Tribe (CRITFC 2020a).

Beginning in 1923, the USACE surveyed the Columbia River and recommended numerous dams to provide navigation, hydropower, flood control, and irrigation (Wilma 2006). A consequence of the subsequent dam building was that traditional tribal fishing grounds along the Columbia River were inundated behind the dams and fish populations were severely impacted. Under various federal and state court rulings, reserved treaty rights to fish at “usual and accustomed” places are a protected property right for Columbia River treaty tribes and these places should be considered or protected under NEPA and Section 106 of the NHPA, as they involve important historical and cultural aspects of Native American heritage (CTUIR 2019).

To account for the hundreds and hundreds of tribal fishing grounds, sites, and villages that were inundated by dam construction, the U.S. Congress set out to provide various sites along the Columbia River within what is now known as Zone 6; a 147-mile stretch of the river between the Bonneville and McNary dams (Exhibit 3-16). Congress authorized the acquisition and construction of these “In-Lieu” sites in the Rivers and Harbors Act of 1945. Between 1945 and 1988, five sites were established totaling approximately 42 acres but fell into disrepair under management of the Bureau of Indian Affairs (BIA). The passage of legislation in 1988, Title IV of Public Law 100-581, authorized restoration of the five original In Lieu sites and construction of other Treaty Fishing Access Sites (TFAS), a total of thirty-one fishing sites were ultimately developed along Zone 6 to provide tribal fishers access to the Columbia River. Of these sites, 26 are TFAS and 5 are In-Lieu sites (CRITFC 2020c). These fishing sites were established under the U.S. Congress, owned by the U.S. Department of Interior (DOI), and administered by the BIA. CRITFC, a subdivision of the four Columbia River treaty tribes, operates and maintains the fishing sites under a long-term contract with the BIA (CRITFC 2020d). In addition to the fishing sites, fish processing facilities were established along the Columbia River to process and sell fish in a safe and clean environment (USACE 2013).

Exhibit 3-16. Columbia River Zone 6 Treaty Indian Fishery



For fisheries management purposes, the entire stretch of the Columbia River is divided into six zones. Zone 6 is an exclusive commercial fishing area reserved for the four Columbia River treaty tribes (CRITFC 2020b). Source: CRITFC

As shown on Exhibit 3-17, two TFAS, one In-Lieu site, and one fish processing facility are located near the existing bridge, including the White Salmon TFAS, East White Salmon Fish Processing Facility, Underwood In-Lieu site, and Stanley Rock TFAS (CRITFC 2020c). The White Salmon TFAS is a roughly 10-acre site on a parcel that borders the existing bridge to the west and includes camp sites, a fish cleaning station, floating dock and boat ramp, net repair and storage facilities, parking, and access to S. Dock Grade Road. The site also includes a structure for ceremonial activities. Tribal fishers reside at the White Salmon TFAS year-round, with over-lapping short-term and long-term stays at the site. Some residents of this site fish at night, including drift net fishing in the Columbia River channel, and rest during the day (CRITFC 2020h). Fishers at this site also utilize the existing bridge piers to tie up boats and gill nets. Another feature of the White Salmon TFAS that is valued by residents are the scenic views of Mt. Hood to the southwest. Due to sedimentation along the Washington shoreline, vessel access to the site is limited to a narrowly dredged side channel which connects to the main Columbia River channel.

Exhibit 3-17. Treaty Fishing Access and Processing Sites

The East White Salmon Fish Processing Facility is a roughly 7-acre site located along SR 14, 0.25 mile east of the existing bridge and includes a loading dock, fish delivery area and parking, freezer storage space, and administrative space (USACE 2013). This facility does not have river access. The BIA also owns an additional parcel to the south of this facility that includes a stormwater outfall associated with the processing plant.

The Underwood In-Lieu site is a roughly 5-acre site located approximately 1.5 miles west of the existing bridge at the confluence of the White Salmon River and Columbia River in Skamania County. Underwood includes a boat launch, dock, and parking and is accessed via Cook-Underwood Road. The mouth of the White Salmon River is particularly significant both as a confluence and as a prominent fishing location. Roughly 0.25 mile east of the Underwood In-Lieu site near the confluence is a parcel owned by the Nez Perce Tribe that was purchased in 1994. While not a designated In-Lieu site or TFAS, this site is an important fishing location for the Nez Perce Tribe (Watters 2020c).

The Stanley Rock TFAS is a roughly 12.5-acre site located approximately 1.5 miles east of the existing bridge in Hood River County and includes camp sites, boat launch and dock, parking, and access to I-84 (Google 2020). Along with the White Salmon TFAS, it is common practice for tribal fishers to use these three treaty fishing sites in conjunction with each other, with the existing bridge providing an important connection between sites.

The activity of fishing and the fisheries that live in and migrate the Columbia River have an integrated commercial and subsistence importance to the Columbia River treaty tribes, as well as a ceremonial and religious importance tied to place and the continuity of tribal culture. Salmon, in particular, have been an integral part of tribal religion, culture, and physical sustenance. Salmon are one of the traditional "First Foods" that are honored at tribal ceremonies (CRITFC 2020e). Salmon and their waters contribute to a sense of place; fishing for salmon is just as integral an aspect of tribal culture as consuming or selling it. The activity of fishing helps establish tribal members appreciation for the land, the water, and the fish within these waters, and the annual salmon harvest allows the transfer of these values from generation to generation (CRITFC 2020f).

Ceremonial fishing occurs predominately during the spring to provide fish for specific ceremonial purposes or events. Subsistence fishing includes fishing for family or personal consumption and can also be used to barter with other federally-recognized tribes. Fisheries are managed with the intent to have some subsistence fisheries open year-round. Commercial fishing is deeply rooted in tribal cultures as well as providing economic benefits to tribal fishers. Commercial fisheries occur in the fall, winter, summer, and occasionally in mid-to-late spring with most fish that are commercially-harvested by the tribes are caught using gill nets (CRITFC 2014).

Tribal Consultation

Consultation regarding potential impacts to treaty fishing rights on the Columbia River, including at the White Salmon TFAS, East White Salmon Fish Processing Facility, Underwood In-Lieu site, and Stanley Rock TFAS has been undertaken by ODOT and FHWA with the Columbia River treaty tribes, along with coordination with the U.S. BIA and CRITFC. In addition, consultation has occurred with the Cowlitz Indian Tribe, CTSI, and the Grand Ronde. To date, consultation on treaty fishing rights has included meetings and presentations with the U.S. BIA, CRITFC, and the Cultural Resources Committee and Fish and Wildlife Commission of the CTUIR. Members of the Project team met with CRITFC's maintenance manager at the White Salmon TFAS to tour the site and the Port sends monthly updates regarding the Project to key elected tribal leaders. In addition, the Warm Springs, the Yakama Nation, and the Nez Perce Tribe prepared confidential ethnographic studies to describe their respective tribes' culture and customs that pertain to this area of the Columbia River Gorge. Tribal consultation is discussed further in Chapter 5, Public Involvement, Agency Coordination, and Tribal Consultation.

Consultation with the tribes has provided key background information about the importance and use of tribal fishing sites and fisheries, as well as concerns about the impacts from the Project to these resources. From the consultation that has occurred to date, concerns are generally focused around construction impacts to the White Salmon TFAS (site). These concerns include noise impacts at the site and to in-water fishers, limited road and vessel access, turbidity and under-water noise, night fishing and safety concerns regarding in-water construction materials, sediment build-up, construction debris drifting to the site, and in-water work overlapping with ceremonial and subsistence fishing seasons. Long-term concerns from the Project would include permanent easements on the site from the placement of a bridge pier and the overhead bridge deck, garbage being thrown off the new shared use path and drifting to the site, as well as increased visibility of the site from non-tribal members using the shared use path that could lead to unauthorized access of the site (CRITFC 2020h) and/or decrease privacy for residents, ceremonial activities, and general use of the site. In addition, the existing bridge piers near the site are utilized to tie up boats and gill nets.

Consultation with the tribes are ongoing, including discussions regarding potential impacts to cultural resources, tribal fishing sites, access to the river, fishing activities from the shoreline and in the river, and fisheries. Future in-person consultation between the Project team and the tribes has been delayed indefinitely due to the coronavirus disease 2019 (COVID-19) pandemic. Tribes have been particularly impacted by the COVID-19 pandemic, which has resulted in tribal government shut-downs and limited access for members to tribal committees. Alternative methods to solicit input from tribes and tribal fishers are being planned -as direct contact will not likely be possible while the pandemic continues. These methods include virtual meetings with tribes individually and collectively, as well as engaging tribal fishers directly (contact free) by placing signage and renderings at tribal fishing sites and requesting feedback. In addition, the Port continues to look for opportunities to engage with the Yakama Nation at its quarterly fishers' meetings and participate in the annual Columbia River Indian Fishers Expo hosted by CRITFC. Ultimately, the Project team, specifically the Port, seeks to continue consultation through and beyond the NEPA process and replacement bridge construction to develop a long-term relationship with the tribes.

Project Impacts and Benefits

No Action Alternative

The No Action Alternative assumes that the bridge would be closed in the future when it surpasses its operational life. In addition, due to the bridges age, condition, and seismic vulnerability, a substantial event such as an earthquake or barge strike could close the bridge temporarily or permanently. If the bridge were to close, either at the end of its operational life or because of damage from an unforeseen event, tribal fishers that cross the bridge to reach the fishing sites or processing facility would have to travel over 20 miles one-way to cross the Columbia River using The Dalles Bridge or the Bridge of the Gods. Relating specifically to the White Salmon TFAS, the No Action Alternative would not provide spill and stormwater runoff protection near the site and would not provide any long-term benefits to benthic habitat.

Build Alternatives

Construction of the build alternatives would lead to different degrees of impacts to tribal fishing and use of the processing site near the bridge (Exhibit 3-18). The White Salmon TFAS would experience the greatest amount of construction impacts under Alternative EC-2, due to the proximity of this bridge alternative and the site, as well as the presence of residents and fishing activities at this site year-round. As detailed below, construction-related impacts to the White Salmon TFAS would include an increased amount of air and dust emissions, noise, underwater noise, vibration, and turbidity, temporary restrictions to nearshore fishing areas, traffic congestion and delays, and detours to access the site by vehicle. These impacts would also occur to the White Salmon TFAS under Alternative EC-3 but would be to a lesser extent.

The East White Salmon Fish Processing Facility would experience the greatest amount of construction impacts under Alternative EC-3 due to the proximity of this alternative and the site. Construction-related impacts to the processing facility would include an increased amount of air and dust emissions, noise, traffic congestion and delays, and vehicle detours to the site under both build alternatives.

Alternative EC-2 would require approximately 0.4 acre of temporary construction easements at the White Salmon TFAS; this easement would be on the southeast corner of the parcel (submerged) for construction of one bridge pier. Alternative EC-3 would require approximately 0.03 acre of temporary construction easements at the White Salmon TFAS and 0.1 acre at the East White Salmon Fish Processing Facility for work along SR 14 associated with highway improvements. Construction impacts from the build alternatives to the Underwood In-Lieu site, Stanley Rock TFAS, and the Nez Perce Tribe property would be minimal due to these sites being over 1 mile away and would be limited to traffic congestion, delays, and detours to the sites.

Property Impacts

Alternative EC-2 would encroach onto the White Salmon TFAS parcel and require approximately 0.3 acre of permanent land easement for the placement of a bridge pier. As shown on Exhibit 3-19, this encroachment and permanent land easement would occur on a submerged portion of the parcel, which was platted prior to construction of the Bonneville Dam and then submerged under what is now known as the Bonneville Pool. In addition, an aerial easement would be required for the overhead bridge deck across this site. These easements would not change the overall function of the site but would bring bridge users closer to the site and near-shore fishing areas. While the replacement bridge would have barriers and railings, some debris from vehicle travel could become airborne and fall onto the submerged portion of the White Salmon TFAS under Alternative EC-2 (see Shared Use Path section below regarding the potential for debris and garbage from pedestrians and bicyclists to be thrown or blown off the bridge).

Residents and fishers at the White Salmon TFAS could be expected to have a higher sensitivity to changes in the visual environment than other uses or sites during Project construction due to the site's close proximity to construction activities. Once constructed, residents and fishers would encounter a taller bridge with fewer in-water piers as compared with the existing bridge, opening larger viewing windows along the river and to surrounding landscapes.

As shown on Exhibit 3-20, Alternative EC-3 would require approximately 0.04 acre of permanent easement on the East White Salmon Fish Processing Facility parcel for road improvements to SR 14.

While property access could be limited and require short detours due to construction work areas, access would be maintained throughout the duration of construction and would be temporary and short-term. River access to/from the White Salmon TFAS, Underwood In-Lieu site, Stanley Rock TFAS, and the Nez Perce Tribe's property would all be maintained throughout the duration of construction with some limitations for safe navigation around construction barges, equipment, and activities. These limitations during construction would not significantly impact vessel navigation to these sites. Due to sediment buildup near the White Salmon TFAS, a channel had to be dredged to access the site from the main Columbia River channel. This side channel would also be maintained during construction to preserve vessel access to/from the site. (See further discussion below regarding sedimentation from the Project.)

Noise would be temporarily increased at the White Salmon TFAS and East White Salmon Fish Processing Facility during construction. Noise impacts would be the greatest at the White Salmon TFAS due to the presence of year-round residents and ceremonial activities. Near-shore fishers at the White Salmon TFAS would also be impacted by construction noise. In addition, some residents of this site fish at night and rest during the day; as prescribed construction hours are during the daytime, construction activities could disturb these fishers' schedules. The contractor would be required to comply with all state and local sound control and noise level rules, regulations, and ordinances and utilize equipment that complies with noise standards of the U.S. Environmental Protection Agency (EPA). Once construction is completed, noise near these sites would return to current noise levels. Along with an increase in noise during construction, the presence of construction workers along the shoreline and in the river may intrude on the privacy of residents, fishers, and/or ceremonial activities at the White Salmon TFAS.

Construction-related activities would also result in increased particulate matter in the form of fugitive dust, as well as exhaust emissions from material delivery trucks, construction equipment, workers' private vehicles, and any associated traffic delays near the White Salmon TFAS and East White Salmon Fish Processing Facility. Any construction work performed would be required to take precautions limiting fugitive dust emissions to not to create a nuisance. Dust and exhaust emissions would be minor and short-term in duration and would not result in adverse or long-term impacts to these sites or tribal members using the sites.

Fish and Fish Habitat

The portions of the Columbia River that are within the API are used by several native and non-native fish species, including species with special regulatory status at either the state or federal level, and important fish species to the Columbia River treaty tribes. These include populations of anadromous salmon, steelhead, and bull trout, which are listed under the federal ESA, as well as Pacific Lamprey and North American green sturgeon, which are Washington State priority species. Additional native fish species include white sturgeon, river lamprey, northern pikeminnow, and rainbow trout, among others. Non-native fish species are also common within the waters of the API and include largemouth bass, smallmouth bass, crappies, and walleye.

Under both build alternatives, there would be over-water and in-water work that have the potential to discharge contaminants into the river near the White Salmon TFAS. Potential sources include uncontained construction and demolition debris, leaks and/or spills from construction and demolition equipment, marine vessels, and contaminated materials from demolition of the existing bridge. These potential temporary impacts could affect fish and their habitat function by reducing water quality, reducing visibility, and by reducing habitat for species susceptible to predation. Avoidance and mitigation measures would be employed during construction and demolition to prevent and account for unanticipated discharges into the river.

Due to the steel grated deck of the existing bridge, stormwater and spills currently discharge directly into the Columbia River, carrying various pollutants that effect aquatic organisms including fish species will special regulatory status and culturally sensitive fish species. The build alternatives would be required to construct and maintain stormwater treatment facilities to account for runoff, and the bridge would be constructed with a concrete bridge deck, preventing direct spills and discharges to the river; thereby, reducing impacts to fish and fish habitat compared to the No Action Alternative.

The replacement bridge would result in an increase in the quantity of over-water coverage and shading on the White Salmon TFAS parcel compared to the existing bridge, which can create habitat for predatory species and affect habitat suitability for juvenile salmonids and other aquatic species. The effects to habitat function from overwater shading would be minimal given the height and open structure of the replacement bridge. The new structure would be elevated between approximately 20 feet and 94 feet above the water's surface over the length of the bridge. This would greatly reduce the potential impact of shading. The existing bridge is approximately 57 feet above the water. The shading created from the replacement bridge would be constantly moving, and the shape and intensity of the shading would not be a solid dark area but a more diffuse irregular shape. This reduces the extent of the functional impact of the shading. The biological assessment (BA) (Appendix B) for the Project has determined that the impacts to habitat functions for this increase in coverage would be insignificant.

Lighting on the river surface at night has the potential to impact out-migrating juvenile salmon by increasing their visibility to predatory fish species. Construction of the replacement bridge and removal of the existing bridge would occur during prescribed day-time construction hours and within an IWWW (see below) that avoids peak run timing for juvenile salmon. Construction lighting on the river surface would be avoided or very minimal and is not expected to have an impact on out-migrating juvenile salmon.

As mentioned, vessel access to and from the White Salmon TFAS is limited due to sediment build-up. In-water work activities could disturb sediments and temporarily elevate turbidity levels above background conditions within the vicinity of the Project. The geographic extent and duration of any potential increases in turbidity are expected to be limited and short-term. Installation of piles, drilled shafts, and cofferdam piles disturb relatively small amounts of material, and the potential for generating turbidity is greatly reduced. Activities conducted within cofferdams or other isolated work areas near the site would introduce only minimal amounts of sediment into the water. Water would be allowed to settle before removing cofferdams to minimize the turbidity plume, and turbidity would not be allowed to exceed the levels, distance, or duration specified in the permits for the activity. Because periods of elevated turbidity associated with the Project would be short-term in nature, and fish are not confined to the immediate project vicinity, prolonged exposure would not occur. In addition, the implementation of BMPs would help ensure that these effects would be localized and temporary, limited in duration, and would result in minimal impacts to water quality. These BMPs would ensure that the amount and extent of turbidity would meet the terms and conditions of water quality permits that would ultimately be issued for the project, in particular the Section 401 Water Quality Certifications that would be obtained from Oregon DEQ and Ecology.

Elevated underwater noise has the potential to affect fish species, such as temporary avoidance of the area, changes in migratory routes, predator avoidance, or interruption of reproduction. The loudest source of underwater noise from construction would come from the impact installation of the structural piles for the replacement bridge and the removal of piles of the existing bridge. While pile construction could potentially affect some adult and/or juvenile fish, these disturbance-level effects would not be expected to significantly interfere with behaviors such as migration, rearing, or foraging (Appendix E, Fish and Wildlife Technical Report). The Project has been designed to minimize the likelihood of any impacts resulting from pile installation/deconstruction activities. To account for underwater noise on or near the White Salmon TFAS parcel, various minimization and avoidance measures would occur that would decrease fish impacts from underwater noise, such as bridge pile installation via vibratory hammer, installation of a bubble curtain to attenuate underwater noise, and adhering to approved in-water work periods. The bubble curtain would be consistent with standard NOAA Fisheries/USFWS bubble curtain specifications and a hydroacoustic monitoring plan would be developed and implemented confirm the effectiveness of the curtain. The geographic extent and duration of the elevated underwater noise would be temporary and localized and would return to ambient conditions when construction is completed. As detailed in the Fish and Wildlife Technical Report (Appendix E), vibratory pile driving and removal is not likely to adversely affect any fish species.

The permanent installation of bridge piles and footings would result in the permanent loss of benthic habitat within the Columbia River. However, the replacement bridge would have fewer in-water piers than the existing bridge, resulting in a net reduction in permanent impacts of approximately 0.2 acre in benthic habitat due to less acreage devoted to bridge footings once the existing bridge is removed.

For more information about potential impacts and mitigations to fish species, fish habitats, and water quality, see Appendix E, Fish and Wildlife Technical Report, Appendix Q, Waterways and Water Quality Technical Report, and Appendix B, Biological Assessment. A Biological Opinion will be included in Appendix B of the Final EIS/ROD once ESA Section 7 consultation is complete.

Tribal Fishing

Some tribal fishing practices near and on the existing bridge could be impacted by the construction and establishment of the replacement bridge. Certain construction and removal activities in the Columbia River would be restricted to an IWWW. Preliminary discussions with WDFW, ODFW, NOAA Fisheries, and USFWS indicate that in-water work activities would likely be restricted to October 1 – March 15 of each year. Tribal fishing seasons are determined by the fish runs and include input by CRITFC and vary by tribe, occur year-round, and sometimes without set timeframes. As such, it would not be possible to avoid an overlap of the IWWW for the Project and all tribal fishing seasons. While there is no single work window that avoids all fish species, the proposed October 1 – March 15 window was determined to be the most biologically defensible window for the Project, as it allows for an expedited construction schedule, while avoiding the peak run timing of both adult and juvenile salmon and steelhead. This proposed IWWW also avoids extending into important spring fishing seasons for the tribes, including ceremonial fishing and sturgeon fishing.

The existing bridge piers are utilized by some tribal fishers for tying up boats as well as gill nets. The replacement bridge would have fewer bridge piers than the existing bridge, potentially decreasing opportunities for tribal fishers to tie up boats or gill nets. During construction, tying up boats or gill nets to bridge piers would be limited to piers outside of designated construction zones. Construction for the replacement bridge could lead to an increase of construction debris in the river near fishing areas; however, avoidance measures would be employed during construction to prevent unanticipated discharges into the river. While the replacement bridge is being constructed, the existing bridge would remain in place, resulting in an increase of in-water structures and other objects (e.g., barges) for fishers to maneuver around. As mentioned, some tribal fishing occurs at night, including drift net fishing in the Columbia River channel. The increase of in-water structures and other objects may present safety issues, especially for nighttime fishers.

Shared Use Path

The existing bridge does not accommodate pedestrians and bicycles. The build alternatives include a shared use path that would establish a pedestrian and bicycle connection across the river that tribal fishers could use in addition to vehicle travel to the nearby fishing and processing sites. The shared use path would increase visibility of the White Salmon TFAS for non-tribal pedestrians and bicyclists and, under Alternative EC-2, would bring people walking and biking in close proximity of the White Salmon TFAS. CRITFC has expressed concern that new pedestrian and bicycle facilities near this site could increase unauthorized access based on experiences with other TFASs on the Columbia River (CRITFC 2020h). Increased visibility of the White Salmon TFAS from the shared use path could also decrease privacy for ceremonial activities and for short and long-term residents of the site. In addition, there could also be an increase of garbage and debris in the river near the site from pedestrians and bicyclists using the shared use path.

Exhibit 3-18. Summary of Impacts and Benefits to Treaty Fishing and Processing Sites

		No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Construction Impacts	White Salmon TFAS	• None	• 0.4 acre of temporary construction easements	• 0.03 acre of temporary construction easements
			• Air and dust emissions, visual impacts, privacy concerns, noise, underwater noise, vibration, turbidity and sediment, temporary limitations to nearshore fishing areas, traffic congestion and delays, and detours to the site	
			• Increased safety issues due to in-water obstacles for fishers to maneuver around	
	East White Salmon Fish Processing Facility	• None	• No temporary construction easements	• 0.1 acre of temporary construction easements
			• Air and dust emissions, noise, traffic congestion and delays, and detours to the site	
	Underwood In-Lieu Site	• None	• Minor traffic congestion, delays, and detours to the sites	
	Stanley Rock TFAS			
	Nez Perce Tribe Property			
Direct Impacts	White Salmon TFAS	• N/A	• 0.3 acre of permanent easement	• No permanent easement
			• Aerial easement	• No aerial easement
	East White Salmon Fish Processing Facility	• N/A	• No permanent easement	• 0.04 acre of permanent easement
	Underwood In-Lieu Site	• N/A	• None	
	Stanley Rock TFAS	• N/A	• None	
	Nez Perce Tribe Property	• N/A	• None	

		No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Indirect Impacts and Benefits	White Salmon TFAS	• Continued risk of spills discharging to the Columbia River	• Minimized risk of spills discharging to the Columbia River due to the concrete deck; new stormwater treatment facilities	
		• Continued risk of garbage and debris from bridge	• Potential for an increase in vehicle debris on the submerged portion of the site and garbage and debris from pedestrians and bicyclists using the new shared use path	• Potential increase of garbage and debris from pedestrians and bicyclists using the new shared use path
		• Greater benthic habitat loss due to existing in-water piers	• Net reduction in permanent impacts to benthic habitat once existing bridge is removed	
		• Lowest over-water structure/in-water shading on site	• Highest over-water structure/in-water shading on site	
		• Greater number of bridge piers to tie boats and gill nets to	• Decreased opportunities for tying up boats and gill nets due to less bridge piers	
		• Potential for unauthorized use of site	• Potential for an increase in unauthorized use of site due to proximity of new shared use path	
		• Residential and ceremonial privacy concerns	• Potential for a decrease in privacy for residents and ceremonial practices due to proximity of new shared use path	
		• Bridge remains exclusively for vehicles • Eventual bridge closure would require use of an alternate crossing to access all sites	• New pedestrian/bicycle connection across the river • Bridge access maintained	
	East White Salmon Fish Processing Facility	• Bridge remains exclusively for vehicles • Eventual bridge closure would require use of an alternate crossing to access all sites	• New pedestrian/bicycle connection across the river • Bridge access maintained	
	Underwood In-Lieu Site			
	Stanley Rock TFAS			
	Nez Perce Tribe Property			

Exhibit 3-19. Impacts to White Salmon TFAS under the Preferred Alternative EC-2

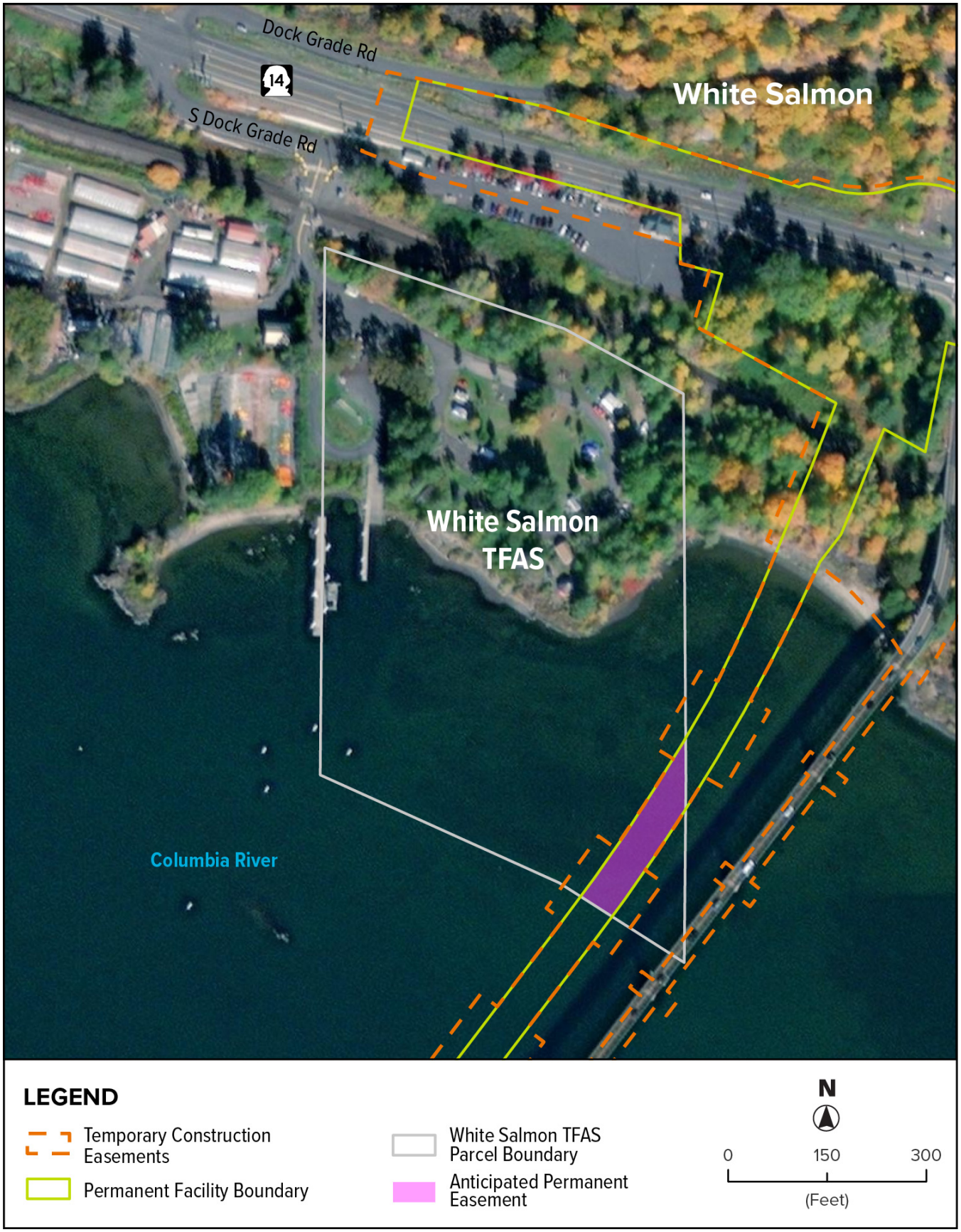
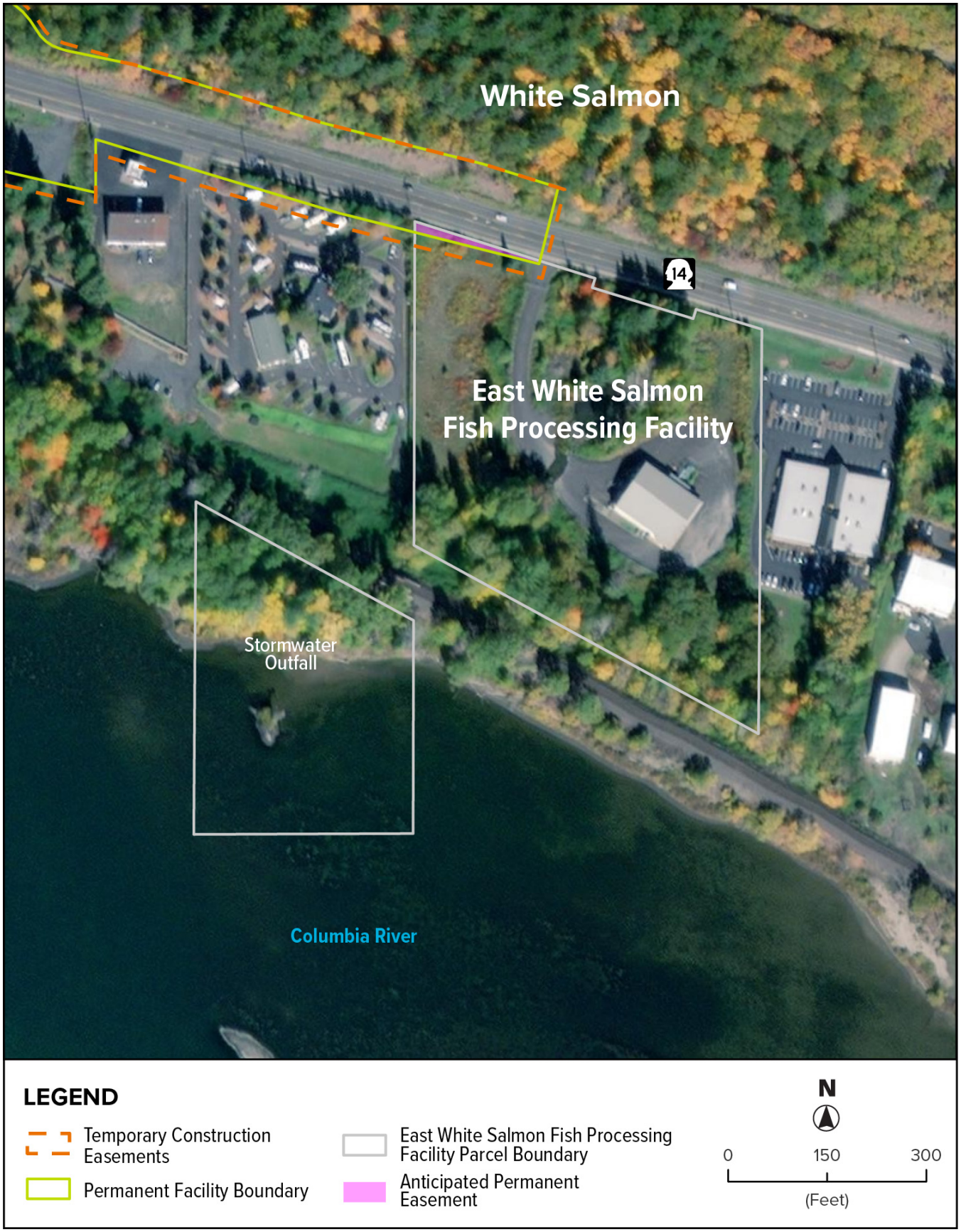


Exhibit 3-20. Impacts to East White Salmon Fish Processing Facility under Alternative EC-3



Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to treaty fishing and processing sites:

- Coordinate temporary changes in roadway and river access to the White Salmon TFAS and East White Salmon Fish Processing Facility with the U.S. BIA, CRITFC, and the Columbia River treaty tribes in advance of construction activities.
- Maintain access for vessel passage to and from the White Salmon TFAS docks, including sedimentation resulting from the Project that encroaches into the dock access channel.
- Continue coordination with CRITFC and the Columbia River treaty tribes during Project construction, providing Project updates and potential impacts to nearby treaty fishing and processing sites and fishing activities on the Columbia River.
- Coordinate with USACE, Bonneville Power Administration, and CRITFC to raise or lower Bonneville Pool level to minimize impacts to fisheries and tribal fishing during construction.

Long-Term Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate long-term impacts to treaty fishing and processing sites:

- Provide signage and fencing (or other barrier) to reduce unauthorized access by non-tribal members to the White Salmon TFAS.
- Coordinate with BIA and CRITFC to identify and install screening along a portion of the west side of the bridge to minimize views into and discourage throwing garbage onto the White Salmon TFAS.
- Consult with Columbia River treaty tribes on pier design regarding tying up boats and gill nets.
- Grant of Easement for Right-of-Way across lands under the jurisdiction of the BIA will be consistent with the Act of February 5, 1948 (25 United States Code [U.S.C.] §§ 323-328) or the Indian Land Consolidation Act (25 U.S.C. § 2218 Sec. 219).

Additional mitigation measures for construction and long-term impacts to access, water quality, vegetation, fish and wildlife, air quality, visual quality, and noise can be found in their respective sections of the EIS (Section 3.1, Traffic Operations; Section 3.7, Waterways and Water Quality; Section 3.16, Vegetation and Wetlands; Section 3.17, Fish and Wildlife; Section 3.18, Air Quality and Greenhouse Gases; Section 3.19, Visual; and Section 3.20, Noise and Vibration).

Additional detail on treaty fishing rights, fishing access sites, and fish processing facilities is provided in the Land Use Technical Report (Appendix I) and Social and Economic Technical Report (Appendix M).

3.6. Geology and Soils

Existing Conditions

Geology in the API consists of a stratigraphy of volcanic and basalt rock formations overlain by an unstable, saturated soil layer that is susceptible to mass movement. Alluvial deposits are abundant and characterized by silty soils with gravel on top of deeper gravel layers (Washington) and sandy, ashy outwash and sand fill (Oregon).

Geologic hazards include the talus slopes north of the Columbia River that are at high risk of movement from disturbance, and the Oregon side is susceptible to liquefaction and ground motion amplification during a large earthquake. The risk of other geologic hazards including landslides, lahars from volcanic eruptions, or seismic hazards on the north side are considered low to moderate.

Talus slope above SR 14 and N. Dock Grade Road.

Project Impacts and Benefits

No Action Alternative

The existing bridge does not meet current seismic design standards and the Oregon side is underlain by liquefiable soils. If a catastrophic geologic event occurs such as an earthquake, landslide, or lahar flows from a Mt. Hood volcanic event prior to the close of the bridge in 2045, direct impacts could include bridge damage or failure and premature bridge closure. Vehicles would no longer be able to use the bridge sending them on circuitous routes and the bridge lift could be stuck or inoperable following a catastrophic event preventing some vessels from passing. Because there would be no ground disturbance under the No Action Alternative, no indirect impacts to soils or geology would result and the risk from geologic hazards would not substantially increase.

Build Alternatives

Construction-related activities from the build alternatives would include the placement of bridge foundations (piers and abutments), clearing and grading for intersection improvements and bridge approaches, construction of retaining walls, and fill placement. Construction impacts from Alternative EC-2 would include tree removal on the north side of the river from bridge construction resulting in an increased risk of erosion and possible offsite transport of sediment-laden stormwater. Oregon side construction would realign the bridge approach slightly to the west requiring vegetation removal, grading, and fill placement. For both Alternative EC-2 and Alternative EC-3, in-water work would include the construction of 12 in-water piers with depths ranging from 18 feet to 139 feet below the mudline depending on bedrock depth. Construction impacts for Alternative EC-3 would be similar to those for Alternative EC-2 with slightly less land surface disturbed (10.9 acres versus 9.1 acres).

Soils on the Oregon side have a high risk of liquefaction and ground motion amplification from a large magnitude earthquake, and soils on the Washington side have a low to moderate risk of liquefaction and ground motion amplification (Exhibit 3-21). A benefit of the build alternatives as compared with the No Action Alternative is that the bridge would be designed to be seismically sound under a 1,000-year event and remain operational under a Cascadia Subduction Zone earthquake.

No indirect geology or soils impacts were identified for the build alternatives. Exhibit 3-22 summarizes geology and soil impacts by alternative.

Exhibit 3-21. Slope Stability and Liquefaction Areas in the Project Area

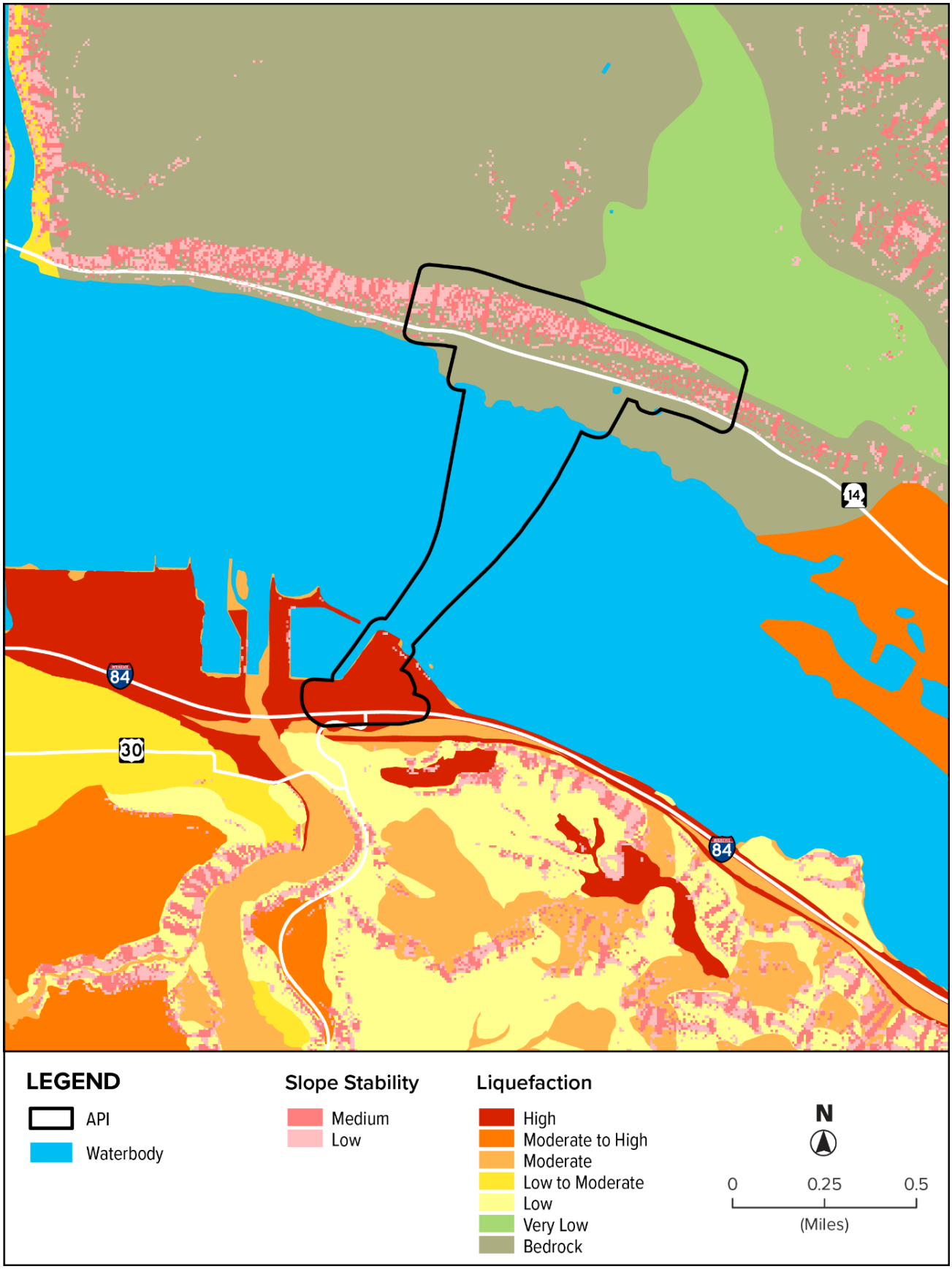


Exhibit 3-22. Summary of Impacts to Geology and Soil Resources

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Construction Impacts	• None	• 10.9 acres of ground disturbance (8.4 acres in WA, 2.5 acres in OR) • 13 piers (12 in-water and 1 on land) and 2 abutments • Low risk rockfall and slope instability	• 9.1 acres of ground disturbance (7.4 in WA, 1.7 in OR) • 13 piers (12 in-water and 1 on land) and 2 abutments • Low risk rockfall and slope instability
Direct Benefits	• None	• Designed for seismic resiliency	
Indirect Impacts	• None		

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to/from geology and soil resources:

- Minimizing the amount of vegetation removal on the Washington side of the Project. (The amount of vegetation removal on the Oregon side of the Project would be minimal due to existing developed or paved areas.)
- BMPs appropriate to the context would be developed for the Project prior to construction. These BMPs would take into account the practices set forth in ODOT and WSDOT regulations and guidance documents including ODOT standard specification Section 00280 (Erosion and Sediment Control) and WSDOT standard specification Section 8.01 (Erosion Control and Water Pollution Control); these BMPs would be implemented during construction to prevent the erosion of exposed soils and eliminate the off-site transport of sediment laden stormwater.
- Performing site stabilization and restoration such as replanting and reseeding for those areas of exposed soils that are no longer under active construction.

Long-Term Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate long-term impacts to/from geology and soil resources:

- Designing the bridge foundations following the most current version of the AASHTO load and resistance factor design bridge design specifications.
- Excavating unsuitable and/or liquefiable soils beyond the footprint of each embankment and replace with engineered fill as necessary.
- Design the bridge to withstand anticipated ground shaking associated with a 1,000-year seismic event and remain operable following ground shaking associated with a 500-year Cascadia Subduction Zone event.
- Designing and constructing stormwater treatment facilities in accordance with applicable stormwater regulations in Oregon and/or Washington that would collect, treat, and disperse stormwater runoff from the bridge so runoff would not create an erosion hazard.

Additional detail on geology and soil resources is provided in the Geology and Soils Technical Report (Appendix F).

3.7. Waterways and Water Quality

Existing Conditions

Main stem of the Columbia River, looking upstream.

The Hood River Bridge crosses the main stem of the Columbia River. On the west side of the bridge, the river's vegetated riparian corridor extends north approximately 450 feet from the river's shoreline to SR 14 and approximately 270 feet on its east side to the BNSF Railway tracks. On the Oregon side, the riparian corridor has been heavily modified by development including marina construction, river bank armoring, and construction of beaches and jetties and retains little or no natural habitat.

The Columbia River and the Hood River, which enters the Columbia River downstream of the bridge, have water quality impairments and are 303(d)-listed for dissolved gases and dioxin (Columbia River) and heavy metals and temperature (Hood River). Both rivers are subject to Total Maximum Daily Load limits. Columbia River hydrology in the API is influenced by the Bonneville Dam and inflow from the Hood and White Salmon rivers. There is little floodplain adjacent to this section of the Columbia River due to the dam controlled environment. Benthic substrates consist largely of silts and medium-to-coarse alluvial sands typical of this reach of the Lower Columbia River.

The 100-year floodplain elevation at the Project site is approximately +90.4 feet (North American Vertical Datum 1988). The river has been largely isolated from its historic floodplain, and hydrology is controlled by dams upstream and downstream of the project site.

Soils on the Washington side were formed from the basalt cliffs above and are moderately deep and well-drained, with moderate runoff potential. Very little fill is present on the Washington side. Soils on the Oregon side of the Project are alluvial deposits from Hood River, are generally well drained, but have been heavily modified by fill for development.

On the Washington side, usable groundwater comes from wells in basalt formations more than 400 feet deep. Shallow wells have static water levels ranging from 22 feet to 42 feet deep. Shallow wells on the Oregon side terminate at depths less than 30 feet and have water levels ranging from 5 feet to 15 feet deep.

The USACE manages water levels, the federal navigation channel, and levees along the Columbia River. The existing bridge crosses over the navigation channel on the Columbia River, which extends 83.2 miles from Vancouver, Washington, to The Dalles, Oregon. This section includes a shallow draft navigation channel and pile dike structures that stabilize the channel. The 300-foot-wide navigation channel is authorized to be 27 feet deep, but is currently maintained to a 17-foot depth, which is considered adequate for current users (primarily tug and barge traffic). Actual water depths at the Project location are much deeper ranging from approximately 35 feet to 50 feet deep according to USACE hydrographic surveys (USACE 2020). USACE also has property rights along the shoreline in the form of restrictive easements providing for the continued operation and maintenance of the reservoir behind Bonneville Dam. Development activities within these areas must be consistent with the language of the specific agreement and/or requires review and approval by the USACE. Two levees are located in the general vicinity of the Project, but outside the API; these include a levee on the Washington side of the river located approximately 2 miles upstream from the Project near the City of Bingen and an embankment located along Hood River before it enters the Columbia River upstream from the Port's Marina.

Project Impacts and Benefits

No Action Alternative

Direct impacts to water quality under the No Action Alternative would include the continued discharge of untreated stormwater and hazardous materials such as petroleum from the regular use of vehicles and unforeseen spills. Pollution would enter the river through the open deck grate and be conveyed by the approaching roadways to the north and south. If a catastrophic event occurs such as an earthquake, landslide, or barge or vessel strike, the bridge could be damaged or collapse into the river. Direct impacts from a catastrophe could include release of hazardous materials such as lead-based paint chips from the bridge, asbestos and hydraulic fluids entering the water from bridge infrastructure, as well as the potential that all or part of the bridge superstructure could fall into the Columbia River. There would be no indirect

improvements to waterway function and navigation from reduction of the number of in-water piers if the existing bridge remains in place.

Build Alternatives

With each of the build alternatives, water quality impacts and benefits would result from removal of the existing bridge and operation of the replacement bridge. There would be no substantial hydraulic impacts from bridge construction or removal.

During construction, impacts to water quality could occur from installing piles and footings or accidental spills of materials or chemicals. Pile or footing installation methods would include waterline footings or cofferdams. Turbidity plumes resulting from the placement of piles or cofferdams are expected to be discrete, temporary, and are not expected to require mitigation. If waterline footings are used, there would also be a risk of accidental spills from poured concrete and drilling slurry or the risk of hydroacoustic impacts depending on whether the piles are drilled or driven. If cofferdam construction is used for footings, local turbidity would increase temporarily during the placement of sheet piles and pipe piles. Spills could also result from concrete poured to connect bridge segments that could impact local pH or from small quantities of fuels (including diesel, gasoline, and propane) for various pieces of small equipment that would likely be stored at the construction staging site. Removal of the existing bridge could result in similar temporary water quality impacts through pier removal and riverbed disturbance. Removal and dismantle of the existing bridge deck could result in materials, such as lead paint and asbestos, entering the water.

Although the build alternatives would increase the amount of impervious surface associated with the bridge deck and roadway improvements compared with the No Action Alternative, stormwater runoff would be treated, resulting in improved water quality. Alternative EC-2 would result in 22.88 acres of impervious surface and Alternative EC-3 would have 22.80 acres compared to 17.77 acres for the exiting bridge. The build alternatives would substantially reduce pollutant discharge compared to the existing steel grated bridge that has no water quality treatment. If left in place, the existing bridge would generate 5,386 lbs. of untreated total suspended solids (TSS) annually to the Columbia River compared to 254 lbs. for Alternative EC-2 and 263 lbs. for Alternative EC-3. The build alternatives would each contribute approximately 1 lb. of copper and 7 lbs. of zinc per year with the No Action Alternative generating slightly more. Both build alternatives would involve work in the floodplain. The Project would represent a small improvement to floodplain and hydrodynamic function at the site as a result of the removal of approximately 5,267 cubic yards of material below the 100-year floodplain elevation in Alternative EC-2 and Alternative EC-3.

Indirect impacts from the build alternatives as compared to the No Action Alternative would include a net decrease in the number of piers, thereby improving waterway function and river navigation. The build alternatives would also prevent direct spills of hazardous materials from the bridge deck into the river because the new deck would be solid and continuous, and any spills would be directed to the stormwater treatment systems near both bridge abutments.

Exhibit 3-23 summarizes waterways and water quality impacts by alternative.

Exhibit 3-23. Summary of Impacts to Waterways and Water Quality Resources

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Construction Impacts	• No in-water work required	• Requires in-water work • 12 new in-water piers • Potential for hazardous material spills to water or ground	• Requires in-water work • 12 new in-water piers • Potential for hazardous material spills to water or ground
Direct Impacts	• Highest pollutant loading (5,386 lbs. TSS, 1.2 lbs. of copper, and 7.5 lbs. of zinc per year) • 17.77 acres of impervious surface	• Less pollutant loading than the No Action Alternative- (254 lbs. TSS, 1.1 lbs. copper, 7.0 lbs. zinc per year) • 22.88 acres of impervious surface	• Less pollutant loading than the No Action Alternative - (263 lbs. TSS, 1.0 lbs. copper, 6.7 lbs. zinc per year) • 22.80 acres of impervious surface
Indirect Impacts	• Continued risk of spills discharging to the Columbia River	• Minimize risk of spills occurring on the bridge from discharging into the Columbia River	

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to waterways and water quality resources:

- A mixing zone for turbidity is authorized in Washington Administrative Code 173.20 IA-030 during and immediately after necessary in-water or shoreline construction activities that result in the disturbance of in-place sediments. The turbidity requirement for Oregon would be determined as part of the Water Quality Certification for in-water work from Oregon DEQ. Use of a turbidity mixing zone is intended for brief periods of time (such as a few hours or days) and is not an authorization to exceed the turbidity standard for the entire duration of the Project. For waters above 100 cfs flow at the time of construction, the point of compliance is 300 feet downstream of Project activities.
- To avoid fish exposure to increased pH, all in-water concrete pours would be isolated and allowed to cure for a minimum of 7 days.
- If drilled piles are used, the resulting contaminated water removed during the concrete pour would be treated to regulatory standards prior to release. Treatment commonly employs detention and treatment tanks. The associated BMPs would be set up in advance and are included in WSDOT Standard Specification Section 8-01 “Erosion Control and Water Pollution Control” and ODOT Special Provision 00290.30(a)(7) “Water Quality.” Wash-water from concrete delivery trucks, pumping equipment, and tools would also be similarly (impervious basins) contained.
- Equipment entering state waters (including barges, boats, cranes, etc.) would be maintained to prevent any visible sheen from petroleum products from appearing on the water's surface. No oil, fuel, or chemicals would be intentionally discharged into the Columbia River. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc. would be checked regularly for drips or leaks; they would be maintained to prevent spills. Concentrated waste or spilled chemicals would be removed from the site and disposed of at a facility approved by Ecology, Oregon DEQ, or the appropriate county health department.
- Spills into the Columbia River, or onto land, with a potential to enter the water would be reported immediately to relevant agencies including U.S. EPA, USCG, Oregon DEQ, and Ecology. Emergency spill control equipment would be on-site at all times. If a spill occurs, containment and clean-up efforts would begin immediately and be completed as soon as possible, taking precedence over normal work. Paint and solvent spills should be considered as oil spills and thus prevented from entering the Columbia River.
- Conduct pre-removal surveys for asbestos, polychlorinated biphenyls (PCBs), and lead for the existing bridge and all other structures to be removed. If necessary, proceed with removal and disposal in accordance with regulations prior to removal of the existing bridge. Prepare pollution prevention plans and hazardous materials containment plans in accordance with WSDOT Standard Specification Section 1-07.15(1) “Spill Prevention, Control and Countermeasures Plan” and ODOT Standard Specification Section 00290.20(g) “Spills and Releases” and Section 00290.30 “Pollution Control.”
- During the construction of the SR 14/bridge approach road intersection, all erosion and stormwater control measures would either meet or exceed WSDOT's Highway Runoff Manual requirements and be used along with other required erosion management techniques established for road construction in the Temporary Erosion and Sediment Control Plan (ESCP).
- Throughout the construction process, the development and implementation of a construction stormwater runoff monitoring plan would provide information on the effectiveness of mitigation measures. Monitoring would, at a minimum, consist of turbidity and suspended solids testing in outfall from stormwater collection ponds, construction de-watering settling basins, and down river just beyond mixing zones. Routine inspections of all sediment control and erosion prevention measures would be included in regular monitoring.

Long-Term Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate long-term impacts to waterways and water quality resources:

- Newly constructed stormwater management for the Project would employ BMPs at both ends of the bridge prior to discharge into the Columbia River.
- Post-construction maintenance and monitoring to document maintenance activities could be undertaken to ensure that stormwater collection systems are functioning properly and that water quality standards are being met.
- During final design, avoid or minimize impacts to the Port's existing marina facilities.

Additional detail on waterways and water quality resources is provided in the Waterways and Water Quality Technical Report (Appendix Q).

3.8. Community and Social Resources

Existing Conditions

There are a variety of community and social resources in the API, including places of worship, museums, public services, healthcare providers, libraries and schools, parks, and recreation facilities as shown in Exhibit 3-24. In addition, the White Salmon TFAS and East White Salmon Fish Processing Facility in the API are used regularly by tribal members with treaty fishing rights. (See Section 3.5, Treaty Fishing Rights, for additional information.)

Agencies, schools, non-profits, and churches provide community resources in the API.

The cities of Bingen, White Salmon, and Hood River are socially and economically diverse communities with concentrated areas of different population groups within each city. On both sides of the river near the existing bridge there are higher concentrations of Hispanic/Latino populations and residents that speak Spanish with limited English proficiency. In addition, there are higher concentrations of elderly residents near the existing bridge compared with Klickitat County overall. Higher concentrations of minority and low-income populations are present on the Oregon side near the bridge, compared with Hood River County.

As noted in Section 3.4, Land Use, the Hood River Bridge provides an integral link between communities on opposite sides of the Columbia River. The existing bridge provides the communities and businesses on both sides of the river with access to a greater number of services (including retail businesses, industrial operations, and recreation and tourism activities); a shared workforce; and access to alternate transportation routes including I-84, SR 14, and OR 35, which are particularly important in emergency situations.

Project Impacts and Benefits

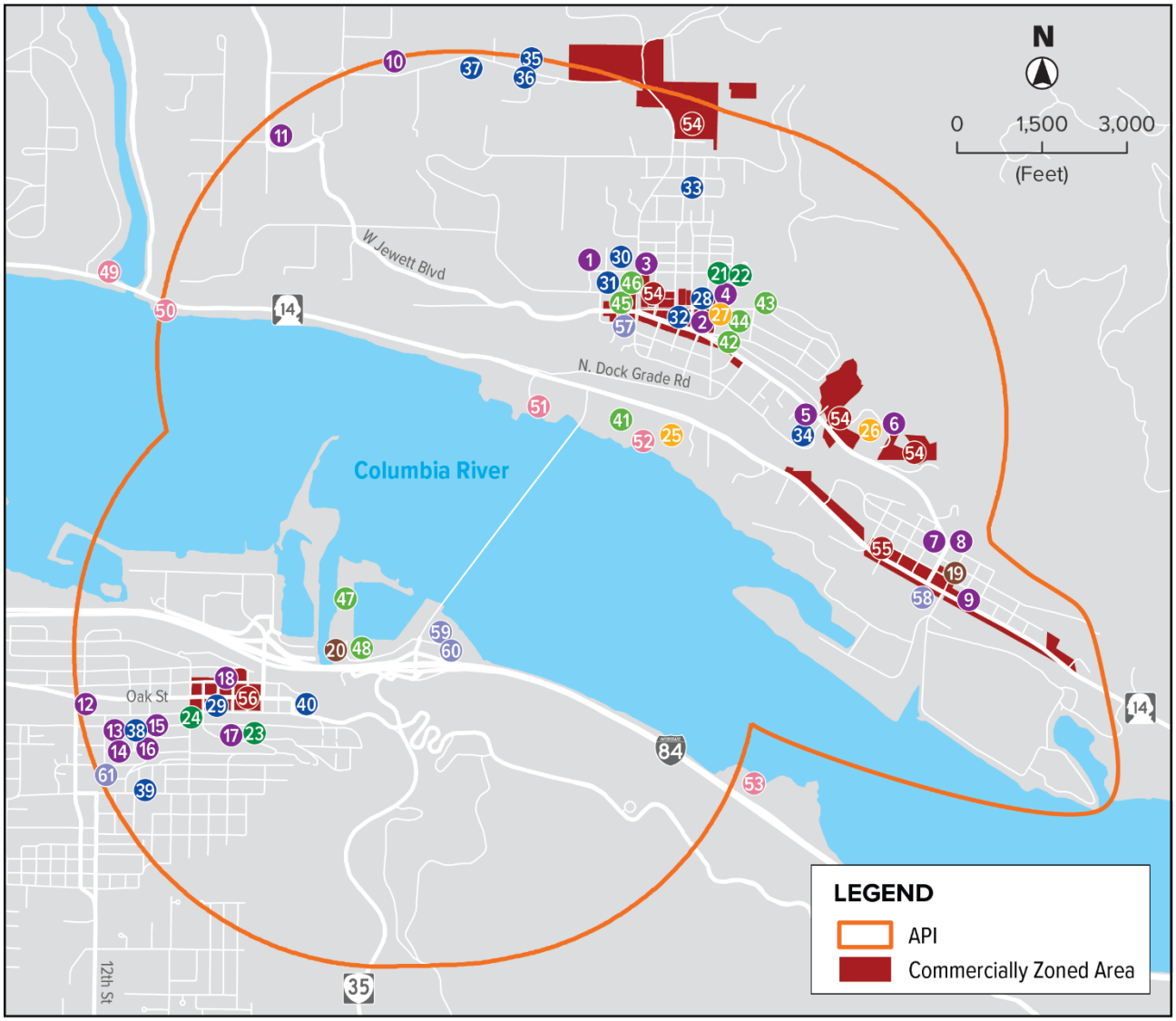
No Action Alternative

Under the No Action Alternative, the existing Hood River Bridge would continue to operate in its existing condition and configuration and toll rates would likely increase over time at a rate similar to past increases, so there would be minimal direct impacts to community and social resources. At such a time in the future that the existing bridge would exceed its operational life or a catastrophic event would occur causing the bridge to close, residents, businesses, freight, emergency responders, and tourists would have to take lengthy detours to cross the Columbia River (Exhibit 3-9). Populations and businesses on the Oregon side would still have connections to I-84; however, local Washington communities would need to travel over 20 miles to alternate bridge crossings to reach I-84. Some Washington residents would likely use services found in the City of The Dalles in place of those in the City of Hood River and community cohesion between the cities of Hood River, White Salmon, and Bingen would be reduced. Given the 20-mile detour to an alternative bridge crossing, it would be likely that cross-river transit service would be eliminated if the bridge closed.

Build Alternatives

During construction of either of the build alternatives, short-term impacts to social and community resources would involve traffic disruptions, noise, vibration, and dust; however, these impacts would be temporary and are not expected to adversely affect community cohesion or population growth because cross-river travel would remain open and access to businesses and local streets would be maintained.

Exhibit 3-24. Community Resources in the API



PLACES OF WORSHIP AND CEMETERIES

1. Saint Joseph's Church
2. Bethel Congregational United Church of Christ
3. United Methodist Church
4. White Salmon Seventh-Day Adventist Church
5. New Beginnings Church
6. Church of the Nazarene
7. House of Grace
8. Our Savior Lutheran Church
9. First Baptist Church
10. Kingdom Hall of Jehovah's Witnesses
11. The Church of Jesus Chris of Latter-Day Saints
12. Hood River Seventh-Day Adventist Church
13. Saint Mark the Evangelist Church Columbarium
14. St. Marks Episcopal Church
15. Immanuel Lutheran Church
16. Vineyard Christian Fellowship
17. Riverside Community Church
18. Young Life-Hood River Valley

MUSEUMS

19. Gorge Heritage Museum
20. The History Museum of Hood River County

PUBLIC SERVICES

21. Klickitat County Pioneer Center
22. Mt. Adams Transit
23. Hood River Circuit Court
24. Hood River County Building Department

HEALTHCARE PROVIDERS

25. Northshore Medical Group
26. Skyline Hospital
27. Comprehensive Health Care

LIBRARIES AND SCHOOLS

28. White Salmon Valley Community Library
29. Hood River County Library
30. Whitson Elementary School
31. White Salmon Valley School District
32. Wildcraft Studio School
33. Little Oak Montessori Elementary School
34. Little Oak Montessori School Children's House
35. Henkle Middle School
36. Wallace & Priscilla Stevenson Intermediate School
37. White Salmon Head Start
38. Hood River County School District
39. May Street Elementary
40. Wilwood Academy

PARKS

41. Bridge RV Park & Campground
42. Firemen's Park
43. Bike Park
44. Pioneer Park Cemetery
45. The Little City Park
46. Rhinegarten Park
47. Port Marina Park
48. Marina Green

TRIBAL FISHING

49. Underwood In-Lieu
50. Nez Perce Property
51. White Salmon TFAS
52. East White Salmon Fish Processing
53. Stanley Rock TFAS

COMMERCIALLY-ZONED AREAS

54. City of White Salmon
55. City of Bingen
56. Downtown Hood River

SOCIAL SERVICES

57. White Salmon Seniors
58. Washington Gorge Action Programs
59. Oregon Human Development Corporation
60. Mid-Columbia Children's Council
61. Providence Dethman House

Long-term, community cohesion would be maintained through the retention of a direct transportation connection across the river and directly enhanced by the new shared use path across the replacement bridge, providing connectivity across the river for non-motorized forms of travel, and additional recreation and scenic viewing opportunities, as listed in Exhibit 3-25. Emergency vehicle response times across the replacement bridge would be improved because other vehicles could move to shoulders, which would facilitate quicker travel for emergency vehicles. Transit times across the replacement bridge would be reduced under both build alternatives because the speed limit of the replacement bridge would be higher than the existing bridge. A safer driving experience would be provided for all forms of motor vehicles crossing the river. No community resources would be displaced under Alternative EC-2; under Alternative EC-3, displacement of The Marketplace would result in displacement of the offices of two non-profit organizations: one that provides services to farmworkers and one that provides education, family, health, nutrition, safety, and transportation services for children.

The new shared use path would increase cross-river pedestrian and bicycle traffic, which in turn could result in the indirect impact of a need for additional improvements to existing pedestrian and bicycle facilities or a need for new facilities over time.

Exhibit 3-25. Summary of Impacts to Social and Community Resources

	No Action Alternative	Preferred Alternative EC-2	Alternative EC-3
Construction Impacts	• None	• Temporary traffic detours, noise, vibration, and dust would cause minor adverse impacts on quality of life	
Community Cohesion	• Reduced cross-river connectivity when bridge is eventually closed	• Cross-river transportation connection retained • Enhanced by addition of shared use path, providing improved bicycle and pedestrian connectivity, additional recreation opportunities, and additional views of Columbia River	
Emergency Response	• Substantial detours required when bridge is eventually closed	• Travel time of emergency response vehicles improved across the river	
Transit	• Cross-river transit likely to be eliminated when bridge is eventually closed	• Improved cross-river transit time	
Vehicle Travel	• Substantial detours required when bridge is eventually closed	• Safer driving experience across bridge with wider travel lanes and shoulders for disabled vehicles and increased speed limit	
Residential or Community Resource Displacements	• None	• None	• Two non-profit organizations that provide community resources

Avoidance, Minimization, and/or Mitigation Measures

Construction Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate construction impacts to social and community resources:

- Send English and Spanish notices, flyers, email blasts, and/or social media posts to residents, businesses, Project stakeholders, schools, churches, emergency services, law enforcement, community service organizations, community facilities, service providers, recreation outfitters, and local media in advance of construction activities to provide information about upcoming construction activities and schedule, detour routes, and temporary utility service disruptions, if any.
- Coordinate temporary changes in access to the White Salmon TFAS with the U.S. BIA, CRITFC, and the four treaty tribes in advance of construction activities.
- Provide signed detours for pedestrians and bicyclists that use any trails or sidewalks near the construction activities.
- Install variable message signs in advance of construction activities to allow travelers to plan alternate routes.
- Where construction work zones would alter existing pedestrian facilities, confirm that ADA-compliant alternate routes and detour signage are provided.

Long-Term Impacts

The following measures would be implemented by the bridge owner to avoid, minimize, or mitigate long-term impacts to social and community resources:

- Ensure that newly constructed pedestrian facilities associated with the Project are ADA-compliant to provide connectivity between the communities and businesses, employers, and other destination points.
- All acquisition of real property required for the construction of the replacement bridge would comply with the requirements of the federal Uniform Act, the Washington Relocation Assistance – Real Property Acquisition Policy (RCW 8.26), or the Oregon Relocation of Displaced Persons statutes (ORS 35.500 – 35.530).

Additional detail on social and community resources is provided in the Social and Economic Technical Report (Appendix M).