Basis of Design

SR 207 Realignment - Nason Creek Floodplain

SR 207, MP 0.19 to MP 0.87

WIN# B20700F
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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
North Central Region
Coles Corner, Washington

SIGNATURES	Template Version 2.2
PREPARED BY	REGION APPROVAL
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ASSISTANT STATE DESIGN ENGINEER APPROVAL	
"Not Applicable per Design Manual Chapter 300."	

PRACTICAL DECISION MAKING

Practical decision making is a philosophy that considers each situation, aligns with our financially constrained budget environment, and encourages incremental, flexible, and sustainable investments by focusing on identified performance needs and engaging stakeholders at the right time.

There are six core principles that capture the essence of practical decision making:

- Starts with a clear purpose and need
- Engages stakeholder and looks for partnerships
- Considers incremental, phase solutions
- Considers resource constraints and life cycle cost
- Considers overall system performance
- Applies innovation and creativity

These six core principles are incorporated throughout the document.

Related Documents and Technical Reports

- Chelan County Natural Resources Department, 2011. Nason Creek River Mile 3.3 – 4.6 Alternatives Analysis
- Chelan County Natural Resources Department. 2012. Nason Creek River Mile 3.3 – 4.6 Feasibility Study
- Chelan County Natural Resources Department. 2016. Wetland Delineation Report for the SR 207 Culverts Stream Restoration Projects in Nason Creek RM 4.6 in Chelan County, Washington
- WSDOT Hydraulics and Environmental Services, Chronic Environmental Deficiency Program. 2019 Site and Reach Assessment Nason Creek at SR207 MP0.4, 0.65, 0.9
- Inter-Fluve Inc. 2019. Nason Creek, RM 3.2 - 4.6 Floodplain Enhancement, Basis of Design Report and Alternatives
- Hamer Environmental. 2020. Final Botanical Report for the Nason Creek Floodplain Enhancement Project
- Perteet, Inc. 2021. Draft Feasibility Analysis, SR 207 Realignment, Nason Creek Floodplain
- Inter-Fluve Inc. 2021. Nason Creek, RM 3.2-4.6 Floodplain Enhancement, Basis of Design Report (Phase 3)
- Hamer Environmental. 2021. Wetland Delineation, Nason Creek River Mile 3.4 to 4.6 Fish Enhancement Project, Nason Creek, WA
- Inter-Fluve Inc. 2022. Nason Creek RM 3.2 to 4.6. Supplemental Alternatives Analysis
- Hamer Environmental. 2022. Wetland Delineation, Nason Creek Floodplain Repeat, Winton, Chelan County, WA
- HWA Geosciences Inc. 2023. Draft Geotechnical Report, Yakama Nation Nason Creek Floodplain, SR 207 Reroute
- Inter-Fluve Inc. 2023 Nason Creek, RM 3.8-4.6 Floodplain Enhancement, Basis of Design Report (Phase 2)

General Project Information

Route Information	**SR**	**NHS (Y/N)**	**Functional Class**	**City**		**County**	
	207	N	Rural Minor Arterial	About 15 miles north of Leavenworth city limits		Chelan	
Project Information	**Begin SRMP**	**End SRMP**	**Budget**	**Funding Sub-Program**	**Posted Speed**	**AADT**	**Truck %**
	0.15	1.00	N/A	N/A	55 mph (existing) 45 mph (new)	1,900 (2022)	10.3% (2022)
Brief Project Description	This project will construct new roadway and reroute approximately one mile of SR 207 around the historical Nason Creek floodplain to both improve aquatic habitat conditions and protect roadway infrastructure from Nason Creek.						
Important Project History or Background	The valley bottom within the project area is bisected by Highway 207, which was constructed prior to 1942. Construction of state Route 207 significantly reduced the size of Nason Creeks migration corridor, resulting in a reduction in stream length and an increase in stream and SR 207 interactions. This compressed migration corridor and shortened channel appears to have disrupted geomorphic equilibrium at the sites, putting Nason Creek in an unbalanced state. Nason Creek has repeatedly damaged the highway embankment in multiple locations during flood events, requiring WSDOT to perform emergency highway repairs and to designate three locations along the highway as Chronic Environmental Deficiencies (CEDs). Three roadway repairs have been completed in the last ten years. In 2011 Chelan County Natural Resources Department (CCNRD) led an Alternatives Analysis that identified five project alternatives to reconnect floodplain hydrologic connections to Nason Creek, provide instream habitat, and reduce conflict points between SR 207 and Nason Creek. The alternatives analysis included substantial public outreach and stakeholder involvement. In 2012 CCNRD led a feasibility study to further review options from the 2011 analysis to include six relocation options for SR 207 to remove it from the floodplain, and four options for instream alternatives. Options for relocation SR 207 ranged from 7,350 feet in roadway length to 13,100 feet in roadway length. All SR 207 relocation options had high construction costs that were ultimately considered infeasible to pursue. Yakama Nation Fisheries continued to pursue viable instream alternatives to benefit aquatic habitat that were less expensive. In 2018, the Yakama Nation Fisheries (YNF), Upper Columbia Habitat Restoration Project (UCHRP) and WSDOT determined that Lower Nason Creek was a high priority area for restoration actions that might reduce roadway and Nason Creek interactions. UCHRP, WSDOT and the USFS partnered to develop a habitat restoration project that would benefit both ESA listed species and the SR 207 roadway including repairs to identified Chronic Environmental Deficiency (CED) locations. The habitat restoration would be beneficial but would not provide as much benefit as reconnecting the floodplain.						

	In 2021 Yakama Nation Fisheries commissioned a feasibility analysis to determine if relocation of SR 207 was feasible for a shorter length of roadway than studied in 2012 - approximately 1-mile but would still open up floodplain and reduce stream/roadway interactions. The 1-mile relocation was determined to be feasible. To ensure it was compared to the 2012 options analogously, Yakama Nation also performed a 2022 supplemental alternatives analysis to confirm that this new "7th" option was the best alternative for a project at this location. Per discussions between Yakama Nation Fisheries and WSDOT North Central Region, the Region informed YNF that lowering the speed limit of SR 207 for a 1-mile stretch would be acceptable as they moved forward with roadway design.
Future and Related Projects	The YNF-UCHRP has designed a habitat restoration project within Nason Creek and the existing location of SR 207 that will promote recovery for ESA listed fish by improving floodplain function, fish habitat, creation of off channel habitat, and wetlands and wetland function. This project will follow removal of existing SR 207 in the project area.
Major Environmental Considerations	**Fish** – According to the WDFW SalmonScape map, Nason Creek is home to ESA listed fish species Upper Columbia Spring Chinook, Upper Columbia steelhead, and bull trout. Removal of existing highway embankment, and habitat restoration of the area will need to be designed using UCHRP design guidelines along with WSDOT design guidelines. **Wetlands and surface waters** – There are several classified wetlands in the project area. These areas were mapped in detail by Yakama Nation Fisheries consultants as part of the related documents listed above. The new roadway alignment will be designed to avoid the Class II and III wetlands between the existing and new alignments, including appropriate buffers. The re-aligned roadway will have minor impacts to the Class II wetland on the north end of the project, however these impacts are expected to be mitigated by the additional 13 acres of floodplain to be opened up by the project. **Floodplains** – Per Chelan County GIS the project area is mapped as just south/east of the Nason Creek floodplain. However, the intent of this project is to move SR 207 out of the floodplain and into the upland area away from Nason Creek, thereby reducing associated risks. **Stormwater assessment** – This roadway and river enhancement project will include enhanced stormwater treatment and flow control. The projects' preferred path forward is to follow the NEPA process with USFS as proposed lead agency. Additional permits may be needed as identified during NEPA process. Anticipated permits needed: • Permit 404/401 Coverage • Section 106 Consultation • Hydraulic Project Approval • FEMA No Rise Certification • Section 7 ESA Consultation • Section 402 Construction Stormwater General Permit • Section 4(f) Evaluation

Section 1) Project Needs

Baseline Needs (BN)

BN1 – River restoration and fisheries health

Background: The purpose of this project is to develop a long-term solution for maintenance repairs to SR 207 while minimizing the impacts of maintenance on fish and fish habitat. SR 207 currently restricts Nason Creek from entering its historical floodplain southeast of the river. This project will relocate SR 207 in the upland area away from Nason Creek and remove the existing roadway in the vicinity. This will create new habitat by opportunity for reconnecting the floodplain to Nason Creek.

Metric: Increase floodplain habitat for ESA listed fisheries.

Target: *Reconnect historical floodplain areas back to Nason Creek.*

Complete Streets Needs

Does Complete Streets apply to the project? ☒ **No** ☐ **Yes**

This project is not a WSDOT project, it is a YNF project and therefore is not required to meet Complete Streets requirements.

Contextual Needs (CN)

CN# 1– Chronic Deficiencies

Background: When the current alignment of SR 207 was constructed, Nason creek was nearly 100 feet away from the highway prism at this location, however, the riverbed has moved, and this section of road was washed out in 1995 during a flood event. WSDOT performed an emergency highway repair using riprap along the riverbank during highwater conditions. This prevented the toe of the slope from being constructed below the potential scour depth. Additional rip rap had to be installed over the years to repair additional scouring along the base of the highway. In addition, the width of the highway shoulder had to be expanded for bank protection and rock barbs were installed for stream deflection in 2011. The 2011 highway repair was the third repair in 10 years. A 2019 Site and Reach Assessment of Nason Creek by WSDOT confirmed that three sites within the project area are considered Chronic Environmental Deficiency (CED) Sites.

Metric: *Number of Chronic Environmental Deficiency (CED) Sites*

Target: *Reduce the number of chronic environmental deficiency sites*

Safety Analysis

Was a Safety Analysis performed ☒ No ☐ Yes

The baseline needs for this project are not related to safety. The design will follow current Design Manual requirements for the new roadway which are intended to design and construct roadways that minimize risk for crashes.

Existing Variance

Are there existing Design Variances within the Project Limits? ☒ No ☐ Yes

If YES, can this project correct any of the existing design variances?

No existing design variances.

Section 2) Context

Roadway SR 207 MP 0.15 to MP 1.00

Multidisciplinary Team Members	Yakama Nation Upper Columbia Habitat Restoration Project, WSDOT North Central Region, Washington Department of Fish and Wildlife (WDFW), US Forest Service, Bonneville Power Administration (BPA)

Community Engagement

Past Community Engagement

- As part of the 2011 Alternatives Analysis Report, the project team held 17 meetings to discuss the project, including members of: Wenatchee Habitat Sub-committee, WSDOT, USFS, Longview Timber, Salmon Recovery Funding Board, and technical design team members.
- Current, preliminary roadway design was shared with all multidisciplinary team members, and project team is providing updates as necessary.
- Yakama Nation Fisheries led a public open house in March 2023 near the project site at the Lake Wenatchee Rec Center.
- Adjacent landowners were notified of upcoming project prior to survey and geotechnical investigation. Karl Road and Rieche Road property owners were also engaged to determine feedback on closure of Rieche Road to north of the neighborhood.

Planned Community Engagement

- The project team will remain engaged with all multidisciplinary team members to share information and gain feedback on impacts and construction strategies.
- The project team will hold at least one more open house style public meeting to gain input regarding construction staging.
- Further engagement and coordination with individual homeowners on Karl Road and Rieche Road is necessary to keep them informed of design progress, construction impacts, and mitigation efforts.

Freeway	☐ Rural ☐ Urban	☐ Interstate ☐ Non-Interstate	
Non-Freeway	Existing	☒ Rural ☐ Suburban ☐ Urban ☐ Urban Core	
	Future	☒ Rural ☐ Suburban ☐ Urban ☐ Urban Core	

Bicycles – Complete Street? ☒ No ☐ Yes

Accommodation	Prohibited	Low	Med	High	
Current	☐	☒	☐	☐	Involve Multidisciplinary Team Members
Future	☐	☒	☐	☐	
Comments	Bicycle accommodation will be provided on shoulders, consistent with the rest of the SR 207 corridor in this vicinity.				

Pedestrians – Complete Street? ☒ No ☐ Yes

Accommodation	Prohibited	Low	Med	High	
Current	☐	☒	☐	☐	Involve Multidisciplinary Team Members
Future	☐	☒	☐	☐	
Comments	Pedestrian accommodation will be provided on shoulders, consistent with the rest of the SR 207 corridor in this vicinity.				

Freight

Classification	T-1	T-2	T-3	T-4	T-5	
Current	☐	☐	☒	☐	☐	See Truck Freight Classification
Future	☐	☐	☒	☐	☐	
Comments	SR 207 serves as a detour route when US 2 (also a T-3 classified corridor) is closed through the Tumwater Canyon. The new roadway alignment will be designed with appropriate grades, superelevation, lane widths and curb widening, along with other highway safety features, to provide freight access. The project team is also coordinating with the multidisciplinary team to ensure freight needs are considered in the design.					

Transit

Fixed route type	None	Local	Limited Stops	Express	Transit Agencies
Current	☒	☐	☐	☐	Link Transit (regional service provider) serves the community of Leavenworth but does not extend to Coles Corner, Lake Wenatchee, or Plain. Wenatchee Valley Shuttle and Northwestern both provide transit from Stevens Pass to Leavenworth on US 2, passing Coles Corner, but do not extend on to SR 207.
Future	☒	☐	☐	☐	
Comments	No transit anticipated on this route; however, it will be designed to accommodate all highway vehicles including future transit.				

Section 3) Design Controls		
Roadway __SR 207____ MP __0.15___ to MP ___1.00__		
Design Year	2027 was chosen as the design year for the roadway design elements (selected per guidance from DM 1103.02). This is a chronic environmental deficiency project that incorporates river restoration and fisheries health, so the main concern is to reconstruct the highway outside of the historical floodplain and remove the existing roadway in the year after the new roadway is constructed.	
Design Vehicle	SR 207: WB-67 USFS Road 6603/ Rieche Road: TBD, will provide for access to Chelan County PUD maintenance vehicles.	
Terrain	☐ **Level** ☒ **Rolling** ☐ **Mountainous**	
Access Control	**Existing**	Managed Access – Class 2
	Planned	No Change
	Proposed	No Change
Target Speed	Target speed will be the (new) posted speed of 45 MPH (previously 55 MPH). New alignment introduces both vertical and horizontal curves as at shifts southeast around a historical floodplain. Additionally, SR 207 approaches/leaves a stop condition at MP 0.0, less than 1,000 LF from the closest (new) horizontal curve. Use of this target speed also minimizes impacts to surrounding areas with smaller curve radii required. Physical changes to the characteristics of a corridor will help manage speed. North of project area the speed limit can transition back to existing 55mph.	

Section 4) Alternatives

Alternatives Comparison Table

Alternative ID	Description	Cost	Operations	Safety	→ Baseline Needs →	BN1 – River restoration and fisheries health	→ Complete Streets Needs→	→ Contextual Needs →	CN#1 – Chronic Deficiencies	→ Other Impacts →	USFS forest impacts	Wetland Impacts	Adjacent Property Impacts	Hwy. Maintenance Impacts	Utility Impacts	Stakeholder support
A	Do Nothing	N/A	◕	●		Not Met			Not Met		●	●	●	◕	●	◑
B	River restoration improvements only + stabilization of and repairs to roadway as needed	$	◕	●		Not Met			Not Met		◕	●	●	●	●	●
C	Re-route highway around historical floodplain MP 0.15 to MP 1.10 as shown in 2021 Feasibility Study	$$$	●	◕		Met			Met		◕	◕	◕	◑	◑	◕
D	Re-route highway around historical floodplain and other nearby wetlands MP 0.15 to ~ MP 2.25 as identified in any of alternatives 1-6 as shown in 2023 Supplemental Alternatives Analysis.	$$$$$	●	◑		Met			Met		◔	◑	◔	◔	◔	◔

Legend:
O = Worst
◔ = Worse
◑ = Average
◕ = Better
● = Best

Cost Summary:

The cost of each alternative is primarily dependent on the amount of earthwork required to re-align the roadway, along with potential costs of purchasing Right Of Way.

Alternative A has no capital construction costs.

Alternative B has the lowest construction cost as there are no roadway capital costs or ROW acquisition needed. The costs will all be centered around in-stream improvements with this project, as well as regular maintenance costs and/or emergency response to repair the roadway in the future. Issues and maintenance cost continue to persist and as climate change increases so will WSDOT's requirements for infrastructure protection.

Alternative C will incur similar in-stream improvement costs to Alts B and D, as the complicated instream work planned for Alt B will be re-utilized for different enhancements in the area of roadway removal. Construction costs for roadway removal area considered as part of the roadway costs. There are no ROW costs anticipated as the highway alignment will be constructed wholly on one USFS parcel which will be obtained via easement agreement. However, there will be earthwork, roadway, and stormwater construction costs associated with the new alignment to the east. The Alternative C alignment was optimized to balance earthwork while achieving appropriate design metrics for safety and mobility. Alternative C is more costly than Alternative B, but less than Alternative D.

Alternative D encompasses all re-route options 1-6 for the highway as identified in the 2023 Supplemental Alternatives Analysis. These 6 options all re-route the highway for a longer length, incurring more earthwork, roadway, and stormwater construction costs. Additionally, the alignment re-route options all require purchase of private property to construct, which raises ROW costs and design timeline significantly. Finally, these 6 alignments approach areas of geological risk and/or avalanche hazard, as identified in the 2012 Alternative Analysis, as they continued northeast into those zones. Mitigating for slide hazards would be expensive. These reasons combine to make Alternative D the most expensive.

Operations:

Alternatives A and B will not typically affect roadway operations; however, they will affect operations when CED sites require repair and roadway lanes are closed or narrowed.

Alternative C will reduce posted speed from 55mph to 45mph through the re-alignment. However, as the highway will be constructed to meet all current design manual requirements for safety and mobility, no

operational effects on the highway are anticipated. Rieche Road connection to the north will be maintained as requested by USFS but will be gaited to limit access. Its current location is close in elevation to the future alignment of SR 207 and only minor grading is anticipated to make the connection. This will not change mainline SR 207 operations.

Alternative D will reduce posted speed from 55mph to 45mph through the re-alignment. However, as the highway will be constructed to meet all current design manual requirements for safety and mobility, no operational effects on the highway are anticipated. Operational effects on Chelan County's Conard Road would be impacted during construction but would function normally once construction was completed. Rieche Road/ USFS 6603 would likely be removed as the 6 alignments all follow its alignment.

Safety:

Alternatives A and B will not change safety performance of the highway.

Alternative C introduces four horizontal and four vertical curves to SR 207. Guardrail will be required in some locations. The slope of the adjacent hillside above the cut slopes remains within alluvial fans with slopes of 15% to 35% and are fully forested. Per the 2023 Draft Geotechnical Report there are no geological hazards that would affect the safety of the roadway.

Alternative D introduces additional horizontal and vertical curves to SR 207 as the length of re-alignment increases. Guardrail and bridges will be required in some locations. All 6 alignments approach geological areas to the northeast that are considered steep upper slopes, ravines, and headwall areas with slopes increasing past 35% and up to 100% above the cut slopes of the roadway. The 2012 Alternatives Analysis did not fully analyze mitigation measures for these steep slopes above the roadway, but assumed some level of rockslide or avalanche hazard that would need to be mitigated.

Baseline Need Summary:

<u>BN1 River Restoration and Fisheries Health:</u>

Alternative A does not meet this baseline need, as it will not reconnect any floodplain to Nason Creek.

Alternative B does not meet this baseline need, as it will not reconnect any floodplain to Nason Creek. It provides some enhancements to the existing Nason Creek; however it doesn't increase floodplain habitat for ESA listed fisheries.

Alternative C meets this baseline need. It will reconnect 13 acres of historical floodplain habitat to Nason Creek, in addition to creation of new and improved wetlands.

Alternative D (6 alignments) meets this baseline need. It will provide additional habitat and floodplain for Nason Creek, in addition to creation of new and improved wetlands. It could reconnect 68-77 acres of historical floodplain back to Nason Creek. Some of that floodplain is already connected via large 12-foot diameter culverts under the roadway and a historic stream oxbow, but by removing SR 207 and the culverts, Nason Creek could move freely within the whole floodplain.

Complete Streets Need Summary:

N/A

Contextual Need Summary:

<u>CN#1 Chronic Deficiencies:</u>

Alternative A does not meet this contextual need.

Alternative B does not meet this contextual need to eliminate CED sites with instream work and enhancements.

Alternative C meets this contextual need by removing 2 CED sites. It will move the roadway away from the identified Chronic Environmental Deficiency sites by several hundred feet, eliminating the need for continual shoring and protecting the roadway base.

Alternative D meets this contextual need by removing 2 CED sites. It will move the roadway away from the identified Chronic Environmental Deficiency sites by several hundred feet, eliminating the need for continual shoring and protecting the roadway base.

Other Impacts Summary:

USFS Forest Impacts:
Alternative A will not have any impacts on USFS land.

Alternative B will have minor impacts to USFS land due to coordination during the instream work and environmental permitting requirements.

US Forest Service forested land will be impacted by Alternatives C and D as the highway is rerouted. Alternative C has the fewer impacts that alternative D on existing forested USFS parcels, while still fulfilling all baseline needs. Alternative D impacts additional forest and wetland areas along the eastern slopes of the project area since it reroutes additional length of the highway to move around another wetland area.

Wetland Impacts:

Alternatives A and B will not affect any existing wetlands.

Alternative C will impact approximately 0.11 acres of existing wetland at the northern connection back to existing SR 207.

Alternative D will impact existing wetlands with 4 of the 6 alignment options. The impacts range from 1.45 acres to 4.54 acres of direct impact, with some additional indirect impact where the roadway alignment would traverse within the wetland, thus separating sections of it. The two options that don't impact wetlands are those are aligned farther up the slope to the east.

Adjacent Property Impacts:
Alternatives A and B will not affect any private property.

Alternative C is designed to be constructed wholly within one USFS parcel and will not have any direct impacts to private property. There are a few indirect property impacts. At the public meeting for the project, and within Yakama Nation's door-to-door outreach, homeowners adjacent to the project brought up concerns regarding the highway moving closer to their homes on Rieche Road due to highway noise. Additionally, they were concerned about the highway getting closer to the parcel which houses their community well system.

Alternative D alignments are primarily located on USFS property. However, all 6 alignments will all have direct impacts to private property at connection points to existing SR 207. Up to four parcels will be affected on the south end, and up to six parcels on the north end, including one complete property acquisition. It is assumed that all homeowners in the vicinity will have similar concerns to those voiced for Alternative C, as the highway will get closer to their homes and well systems, and potentially displace one owner.

Highway Maintenance Impacts:
Alternative A will require continued maintenance of CED sites where Nason Creek abuts SR 207. Existing 24" and 48" culverts under SR 207 in the project location will continue to require yearly maintenance.

Alternative B will mitigate the CED sites through instream project work, reducing maintenance for the highway. Existing 24" and 48" culverts under SR 207 in the project location will continue to require yearly maintenance.

Alternative C will eliminate two CED sites and existing 24" and 48" culverts when SR 207 is removed. However, the new alignment has approximately 12 new culverts to capture existing flows from Natapoc Ridge that will need to be maintained. Additionally, due to stormwater requirements, this new section of highway will be required to treat stormwater for water quality and provide flow control to back to Nason Creek. This will involve a closed system of asphalt curb, catch basins and pipe, compost amended vegetative ditches, and retentions ponds (2) and outlet structures. Alternative C increases maintenance costs when compared to Alternatives A and B, but will have less maintenance costs than Alternative D.

Alternative D will eliminate two CED sites and existing 24" and 48" culverts when SR 207 is removed. However, each of the 6 alignments will still need to convey stormwater from Natapoc Ridge to Nason Creek via culverts at key locations. Additionally, due to stormwater requirements, this new section of highway will be required to treat stormwater for water quality and provide flow control to back to Nason Creek. This will involve a closed system of asphalt curb, catch basins and pipe, compost amended vegetative ditches, and retentions ponds and outlet structures. The system size is directly correlated with the length of roadway, which is more than double alternative C in all 6 options. Maintenance may also be required for any areas in avalanche or rockslide prone areas identified in Chelan County's 2012 Feasibility Study.

Utility Impacts:
Alternative A will have no utility impacts.

Alternative B will have no utility impacts.

Alternative C will require extensive coordination with BPA, Chelan County PUD, and private communication companies. The new highway alignment will cross under BPA towers, but the roadway shouldn't require any of the electrical transmission lines to be relocated. Chelan County PUD has a transmission line to Lake Wenatchee that runs along existing SR 207 that will need to be relocated to the new alignment. Additionally, they have a transmission line to Plain located approximately on the Rieche Road alignment that will need to be relocation out of the way of the future roadway. There is a possibility that those new lines will be in conflict with the BPA towers. Additionally, there are known communications lines buried under the existing SR 207 alignment that will need to be relocated to the new alignment location.

Alternative D will require extensive coordination with BPA, Chelan County PUD, and private communication companies. All 6 of the alignment options will cross under BPA towers, with one requiring a transmission tower to be moved. Chelan County PUD has a transmission line to Lake Wenatchee that runs along existing SR 207 that will need to be relocated to the new alignment. Additionally, they have a transmission line to Plain located approximately on the Rieche Road alignment that will need to be relocation out of the way of the future roadway. There is a possibility that those new lines will be in conflict with the BPA towers. Additionally, there are known communications lines buried under the existing SR 207 alignment that will need to be relocated to the new alignment location.

Community utility impacts from both Alternatives C and D are unknown currently, as Chelan County PUD has requested 30% plans prior to preparing a relocation strategy. The project assumes that shutdowns for transmission lines will be needed and the communities of Plain and Lake Wenatchee will be impacted. Costs for relocations are unknown at this time.

Stakeholder Support:
Stakeholders are generally in support of Alternative A, as long as their commute is not affected by flood events.

Stakeholders indicated that they were supportive of Alternatives B and C, but preferred the alternative with the least impacts to the highway and drivers, and the least cost. They also indicated support for keeping any ROW impacts away from private property, which is achieved with Alternative C. Alternative D is not supported by stakeholders due to extensive ROW impacts and prohibitive construction costs.

Preferred Alternative C was selected because:

Finding funding to meet the baseline needs of this project has been problematic for years. Due to this, cost is heavily weighted in the selection of the preferred alternative. Neither alternative A or B meet the baseline need. Alternative C meets both the baseline and contextual need. Alternative C's alignment was optimized to balance earthwork and constructability, while achieving appropriate design metrics for safety and mobility, and with no anticipated operational effects. Alternative C is far less costly than Alternative D (Alternative C is approx. 30% to 50% of the cost of alternative D. In 2012 the project partners determined that all 6 of the alignments in Alternative D were infeasible due to the high costs, and inability to secure funding for any of them), with fewer impacts to USFS forest and other private landowners, as well as having more public support.

Outside of this Basis of Design document, Alternative C was selected through a multi-year, multi-stakeholder process that culminated in 2022 with the Supplemental Alternatives Analysis. The Supplemental Analysis considered all previous reports, feasibility studies, and delineations to determine that it was the preferred alternative. Additionally, Yakama Nation Fisheries has been successful in finding design and construction funds for this specific project, due to its size and ability to balance needs.

Section 5) Design Elements Changed

*For each design element below, identify the design elements that will have dimensions changed in the **preferred alternative** for each alignment or location. You can group alignments into a single location if desired. You may need to add or delete columns.*

Design Element	Alignment #1	Notes
1. Lane		
2. Median / Buffer		
3. Shoulder		
4. Streetside / Roadside Zone		
5. Pedestrian Facility		
6. Bicycle Facility		
7. Bridges and Buried Structures		
8. Horizontal Alignment	X	Horizontal alignment will be moved southeast of historical Nason Creek floodplain
9. Vertical Alignment	X	Vertical alignment will change to match horizontal alignment as it moves southeast and up hillside
10. Cross Slope	X	2% cross slope will be transitioned to superelevation (max 6%) in curves
11. Side Slope	X	Side slope will be modified for stormwater treatment and flow control
12. Clear Zone	X	Clear zone will be provided for roadway based on revised (lowered) speed limit.
13. Barrier, Guardrail & Rumble Strips	X	Guardrail will be provided where needed for non-recoverable side slopes or other hazards.
14. Signals, Illumination, and ITS		
15. Signing and Delineation	X	Signing will be revised to show 45 mph speed limit. Delineation will be revised to show a double yellow centerline (no passing).
16. On/Off Connections		
17. Intersection / Ramp Terminal	X	One new intersection will be introduced at USFS Road 6603/ Rieche Road. It will be a tee-intersection with stop control on the minor leg.
18. Road Approaches	X	USFS Rieche Road to be re-profiled to match new roadway profile. Access to road will be controlled per USFS requirements
19. Roundabout		
20. Access Control		